Crows Landing Industrial Business Park Specific Plan Final Environmental Impact Report

Certified by the Board of Supervisors on October 30, 2018

Image: lostamerica.com

Image: Jonathan Westerling

Crows Landing
Industrial Business Park
Stanislaus County

THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS
BOARD ACTION SUMMARY

DEPT: Planning and Community Development — BOARD AGENDA:8.1

AGENDA DATE: October 30, 2018

SUBJECT:

Certification of the Environmental Impact Report for the Crows Landing Industrial Business Park Project (State Clearinghouse No. 2014102035)

BOARD ACTION AS FOLLOWS: **RESOLUTION NO. 2018-0543**

On motion of Supervisor Monteith, **Seconded by Supervisor** Olsen
and approved by the following vote,
Ayes: Supervisors: Olsen, Chiesa, Monteith, and Chairman DeMartini
Noes: Supervisors: None
Excused or Absent: Supervisors: Withrow
Abstaining: Supervisor: None

1) ______ **Approved as recommended**
2) ______ **Denied**
3) __X__ **Approved as amended**
4) ______ **Other:**

MOTION: Approved Staff Recommendation Nos. 1-10; and, **amended** page 35 of the Mitigation Monitoring and Reporting Program (Attachment 3) to add "in coordination with the City of Newman" under Mitigation Measure – Cumulative with Project Transportation 1: Traffic Signal Installation to read as follows "The project shall contribute on a cumulative fair-share basis to the signalizations for Intersections 1, 2, 10, 11, 14, 17, 18, 19, 20, and 25. The project shall also contribute on a cumulative fair-share basis, in coordination with the City of Newman, to the signalization of the following intersections: Fink Road / Davis Road (Stanislaus County); Fink Road / Ward Avenue (Stanislaus County); I-5 NB Ramps/ Fink Road (Caltrans); I-5 SB Ramps/ Fink Road (Caltrans); and, SR 33 intersections with Stuhr Road, Jensen Road, Yolo Street, and Inyo Street."; adopted the Mitigation Monitoring and Reporting Program, as **amended**, and incorporated herein, with which all future development associated with the project shall comply

Elizabeth A King

ATTEST: **ELIZABETH A. KING, Clerk of the Board of Supervisors** **File No.**

THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS
AGENDA ITEM

DEPT: Planning and Community Development BOARD AGENDA:8.1
AGENDA DATE: October 30, 2018

CONSENT ☐

CEO CONCURRENCE: 4/5 Vote Required: No

SUBJECT:

Certification of the Environmental Impact Report for the Crows Landing Industrial Business Park Project (State Clearinghouse No. 2014102035)

STAFF RECOMMENDATION:

1. The Environmental Impact Report for the Crows Landing Industrial Business Park Specific Plan and associated update to the Airport Land Use Compatibility Plan (the "Project") (State Clearinghouse No. 2014102035), consists of the January 2018 Draft Environmental Impact Report ("DEIR") and the October 2018 Final Environmental Impact Report ("FEIR") (together, the "EIR"). Find that the EIR has been prepared and circulated for public review and comment in compliance with the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et seq.; and the CEQA Guidelines, California Code of Regulations, Title 14, Section 15000 et seq. ("State CEQA Guidelines"); and the County's CEQA Guidelines and Procedures for the Implementation of CEQA.

2. Find that the County has reviewed and responded to all comments on environmental issues that were submitted on the DEIR and received during the public review period, as required by CEQA, the State CEQA Guidelines, and the County's CEQA Guidelines and Procedures for the Implementation of CEQA, and responded to one comment letter submitted after the close of the public review period on the DEIR.

3. Find that the EIR adequately identified and addressed all of the significant environmental impacts of the Project and that all feasible mitigation measures to avoid or substantially lessen the Project's significant environmental impacts were identified in the EIR and included in the Mitigation Monitoring and Reporting Program, attached hereto as Attachment 3.

4. Find that no changes made to the EIR after close of the public review period involved significant new information requiring recirculation prior to certification pursuant to CEQA Guidelines Section 15088.5.

5. Find that the Board of Supervisors has reviewed and considered the information contained in the EIR for the Project and that the EIR reflects the independent judgement of the County.

6. Certify that the EIR for the Project (SCH No. 2014102035), was prepared in compliance with CEQA.

7. Adopt the Findings and the Statement of Overriding Consideration for the Project, attached hereto as Attachment 2, including findings that:

    a. Some environmental impacts are identified in the EIR as significant and unavoidable even with feasible mitigation measures adopted and incorporated into the Project and even with goals, objectives, policies, design and development plans and standards, and programs that are part of the Project.

    b. With respect to the adverse environmental impacts that cannot be mitigated to a less-than-significant level, the benefits of the Project outweigh these unavoidable impacts and are therefore acceptable based upon the overriding considerations set forth in the Findings and the Statement of Overriding Consideration for the Project, attached hereto as Attachment 2 and incorporated by reference.

8. Adopt and incorporate into the Project all of the mitigation measures identified in the EIR.

9. Adopt the Mitigation Monitoring and Reporting Program, attached hereto as Attachment 3 and incorporated herein, with which all future development associated with the Project shall comply.

10. Order the filing of a Notice of Determination with the Stanislaus County Clerk-Recorder's Office pursuant to Public Resources Code Section 21152 and CEQA Guidelines Section 15094.

DISCUSSION:

The Environmental Impact Report (EIR) for the Crows Landing Industrial Business Park Project (hereafter "Project") has been prepared for the purposes of environmental analysis pursuant to the requirements of the California Environmental Quality Act (CEQA). The EIR will be used to consider the following project components:

- Adoption of the Specific Plan, General Plan Amendment, and Rezone Application for the Project;
- Adoption of an Airport Layout Plan (ALP) and Narrative Report to support the development of a public-use general aviation airport; and,
- An amendment to the Stanislaus County Airport Land Use Compatibility Plan (ALUCP) to provide new policies specific to the new public-use airport.

The various components of the Project will be considered by the Airport Land Use Commission (ALUC), Planning Commission, and Board of Supervisors at a later date.

For purposes of environmental analysis, Stanislaus County is considered the Lead Agency and the ALUC will act on the Project as a Responsible Agency for adoption of the ALUCP.

The Final EIR (FEIR) for the Project includes: a full list of agencies, organizations, and individuals that provided comments on the Draft EIR (DEIR); verbatim comments received on the DEIR; responses to the comments received; and minor revisions to the DEIR detailed in Chapter 3 of the FEIR (see Attachment 4 – Final Environmental Impact Report).

The DEIR, as circulated for public comment, and the FEIR are available online:
http://www.stancounty.com/planning/pl/act-projects.shtm

Also available online are the Project's draft Specific Plan (including the draft ALP), both the original version and revised Chapter 4 – Infrastructure, and the draft Compatibility Policies and Policy maps for the ALUCP amendment, both the original version, included as Appendix C of the DEIR, and revised version, included as Appendix C of the FEIR.

The DEIR identified the following Project objectives (Section 2.3):

- Create a regional employment center on the former Crows Landing Air Facility property that provides locally based, sustainable-wage employment, and promotes work force development through on-the-job training and support for locally based small business.
- Create an attractive location for industrial, manufacturing, distribution, and other aviation-compatible uses within the site boundaries that can capitalize on the site's proximity to Interstate 5, Interstate 580, Highway 33, and other regional, national, and international transportation facilities while reducing commuter traffic/vehicle miles traveled (VMT) on regional roads.
- Offer a mix of land use classifications to accommodate aviation-compatible uses while remaining flexible in terms of the size and configuration of available parcels, vertical development, and compatibility with surrounding uses and infrastructure.
- Provide services for site workers, such as: transit and alternative transportation options, on-site food service, appropriately located day care facilities, and automated banking opportunities.
- Provide sufficient site infrastructure to enable "shovel-ready" development opportunities. Such infrastructure includes potable and non-potable water, sewer, stormwater management, dry utilities, and circulation improvements (i.e., "backbone development").
- Repurpose former military runway 12-30 for the development of a public-use, general aviation airport to complement the proposed CLIBP and the terms of the property conveyance.
- Provide for an attractive, walkable industrial business park campus that makes a positive statement for the area and for Stanislaus County and respects the needs

of its neighbors, adjacent landowners, and the agricultural character of the County's West Side.

- Honor the unique contributions of the former Crows Landing Air Facility and Stanislaus County to our nation's history, while looking ahead to improve the lives of current and future residents.

The following summarizes the key project components covered by the Project EIR:

SPECIFIC PLAN, GENERAL PLAN AMENDMENT, AND REZONE APPLICATION NO. PLN 2013-0091 – CROWS LAND INDUSTRIAL BUSINESS PARK

The Specific Plan allows for the development of a 1,528-acre site to support a mix of aviation-compatible industrial and business park uses, general aviation, aviation-related land uses, public facilities, a multimodal (bicycle/pedestrian) transportation corridor, and supportive infrastructure. The project is anticipated to develop over 30-years to include a 370-acre public-use airport and 14 million square feet of building space with the potential to generate 14,000 – 15,000 jobs. The project includes a request to establish a Specific Plan for the project, amend the General Plan designation of Agriculture to Specific Plan, and rezone from A-2-40 (General Agriculture) to S-P(2) (Specific Plan).

The Project is anticipated to develop in three consecutive 10-year phases over a 30-year timeframe to achieve project buildout. The County will design, engineer, and oversee the construction of backbone infrastructure needed to support proposed development in Phase 1A. Development of subsequent phases will be reviewed for consistency with the Specific Plan and overseen by the County. The EIR provides an analysis of the following infrastructure options:

- Wastewater Treatment – The County has planned a new sewer collection system that will connect to the City of Patterson Water Quality Control Facility (WQCF) to treat project wastewater, with limited interim use of septic systems during initial site development. If the County determines this option is not feasible, an on-site conveyance and treatment option will be developed.

  The process for design, permitting, and construction for expansion of the WQCF could take up to 12 years. Depending on timing of development in Phases 1 and 2, the County may need to construct a temporary on-site septic system (temporary package treatment plant or other suitable option) to accommodate wastewater needs for part, or all, of Phase 1 and part of Phase 2 development. The County could subsequently connect to the City of Patterson's system.

- Water Supply (Potable and Non-Potable) – The County will explore three alternatives and select a preferred alternative prior to initiation of Phase 1:

  - Option 1: Extend the Crows Landing Community Services District (CSD) service area to include the Project to enable the development of a shared water system under the CSD's existing drinking water supply permit;

- Option 2: Obtain a new water supply permit to enable the County to develop a standalone water supply for the Project; or,
- Option 3: Extend the City of Patterson's water service area to include the Project under its existing drinking water supply permit.

- Stormwater Drainage – The project proposes to widen Little Salado Creek, which traverses the site from south to north, and widen and replace culverts crossing under Runway 12-30, construct a stormwater pond along the northeastern boundary of the Project site, and other measures, such as Low Impact Development (LID) standards, are identified to manage stormwater runoff, while allowing for groundwater recharge.

The on-site and off-site public improvements necessary to serve the Project will be designed by the County to accommodate the envisioned development. Plans will include an infrastructure sequencing program that will coordinate with and allow for orderly development throughout Project buildout. Building permits will not be issued until the County's Public Works Director determines that all improvement plans are complete (engineered and approved) and found to be consistent with the Project's Specific Plan and Financing Plan.

The Stanislaus County Planning Commission will consider the Specific Plan, General Plan Amendment, and Rezone Application for the Project and provide a recommendation to the Board of Supervisors for final consideration.

CROWS LANDING AIRPORT LAYOUT PLAN (ALP) NARRATIVE REPORT

The purpose of the ALP is to facilitate the reuse of one of two runways associated with the former Crows Landing Naval Auxiliary Airfield for the development of a general aviation airport within the Crows Landing Industrial Business Park. The ALP Narrative Report focuses on the immediate needs associated with construction of a general aviation facility and documents short-term and long-range development goals. The ALP is included as Appendix D of the Project's Specific Plan. An updated version is included as Appendix C of the FEIR. The ALP describes the overall design of the airport, with the primary objective to document the extent, type, and approximate schedule of development needed to accommodate the near-term and future airport development goals. The ALUC has no jurisdiction over the aviation facilities proposed in the ALP, only their consistency with the County's Airport Land Use Compatibility Plan (ALUCP).

The ALP will be considered for approval by the Board of Supervisors as part of the Specific Plan at a later date.

AIRPORT LAND USE COMPATIBILITY PLAN (ALUCP)

The ALUCP is a plan that establishes policies to promote compatibility between proposed land uses and the ongoing operation of each public use airport in Stanislaus County. The ALUC adopted a comprehensive update to the Stanislaus County ALUCP on October 6, 2016. The update included procedural and airport-specific policies for the two public use airports in Stanislaus County: the Modesto City-County Airport and the Oakdale Municipal Airport. A "place holder" was provided for the expected update to the former Crows Landing Air Facility. The 2004 airport-specific policies for the former Crows Landing Air Facility remain in effect until proposed policies specific to the proposed Crows Landing Industrial Business Park Airport are adopted by the ALUC. The procedural and airport-specific policies for the proposed general aviation airport at the Crows Landing Industrial Business Park have been updated as a part of the Project, were evaluated in the Project's DEIR, and will go before the ALUC for adoption pending certification of the Project's EIR (see Appendix C of the FEIR).

ENVIRONMENTAL IMPACT REPORT

A Notice of Preparation was issued on October 13, 2014, giving notice of a 30-day comment period through November 13, 2014. EIR Scoping Meetings were held during the comment period on October 23 and 30, 2014, in the community of Crows Landing and the city of Patterson, respectively.

All necessary studies and infrastructure master plans (water, sewer, stormwater, and traffic) were prepared, as well as a DEIR, covering key project components listed above for the purpose of environmental analysis. The following paragraphs summarize the mitigation measures added to the project to prevent and reduce potentially significant impacts to a level of less than significant:

- **Air Quality:** Comply with Indirect Source Rule (ISR); use current phase construction equipment; reduce the single occupant vehicle commute; and assess Toxic Air Contaminants (TAC) and health risks and take actions to reduce such risks, if necessary.
- **Biological Resources:** Conduct plant survey (Little Salado Creek and the willow scrub community); avoid direct loss to raptors (Swainson's Hawk, Burrowing Owl, Tricolored Blackbird, and Loggerhead Shrike); prepare Swainson's Hawk foraging habitat mitigation plan; avoid loss of Pallid Bat – roosts and wildlife nursery sites (located within the former air traffic control tower); and compensate for loss of federally protected waters of the U.S.
- **Cultural Resources:** Protect previously undiscovered archaeological resources.
- **Geology, Soils, Mineral, and Paleontological Resources:** Prepare geotechnical reports; monitor earthwork during earthmoving activities; conduct subsidence monitoring; prepare and implement grading and erosion control plans; and avoid paleontological resources impacts.
- **Hazards and Hazardous Materials:** Prepare and implement a worker health and safety plan and minimize potential exposures to hazardous materials; remove asbestos and lead-based paint according to regulations; avoid landfill material (I-5/Fink Road); perform environmental site assessment (off-site AL Castle Site – seed processor); construction traffic plan; and designate an official truck route.
- **Hydrology and Water Quality:** Prepare and implement: stormwater pollution and prevention plan and associated best management practices, drainage plan,

stormwater quality management plan; provide agreement for maintenance, monitoring, and funding for long-term operational stormwater quality control; provide shallow well setbacks; conduct and report groundwater level monitoring; prepare hydraulic studies for water crossings; and prepare site specific levee design report and implement (Davis Road Levee).

- **Noise and Vibration:** Implement noise and vibration measures from construction traffic: truck route plan, equipment setback, phased construction activities, limit construction hours; use rubberized asphalt material; placement and orientation of day care uses; and implement construction equipment noise reduction mitigation.
- **Traffic and Transportation**: Provide off-site traffic signal or roundabout installations and intersection improvements; and off-site widening to four lanes on Marshall Road (project entrance to State Route 33).
- **Utilities and Service Systems:** Demonstrate adequate wastewater treatment capacity and provide fair-share funding to support capacity expansion, as necessary (City agreement in writing for use of WQCF required).

Potentially significant impacts that cannot be mitigated or cannot be mitigated to a level of less than significant were identified as significant and unavoidable impacts. The following list summarizes the significant and unavoidable impacts:

- **Aesthetics:** Visual character of the project site and surroundings; increase in nighttime lighting and daytime glare and cumulative effects.
- **Air Quality:** Short-term construction and long-term operational emissions and consistency with air quality attainment planning.
- **Agricultural Resources:** Loss of important farmland and conversion of agricultural land and cumulative agricultural resources effects.
- **Greenhouse Gas Emissions**: Increases in greenhouse gas emissions (cumulatively considerable).
- **Land Use, Population, and Housing:** Induced population growth.
- **Noise and Vibration:** Short-term exposure of sensitive receptors to construction noise.
- **Traffic and Transportation:** Existing plus project – intersection operations (facilities outside of County control) and cumulative congestion impacts.
- **Utilities and Service Systems:** Environmental impacts associated with increased demand at City of Patterson WQCF and cumulative utilities impacts.

The Notice of Availability for the 45-day Public Review Period of DEIR was issued on January 22, 2018, and was scheduled to end on March 12, 2018; however, the city of Patterson submitted a request to extend the review period. The County granted the request and provided an additional 45-day Public Review Period for the DEIR that ended on April 26, 2018 for a total public review period of 90 days.

Sixteen comment letters were received in response to the DEIR during the 90-day review period from the following agencies:

- California Northern Railroad;
- California Department of Transportation, District 10;
- Chevron;
- City of Patterson (two responses);
- City of Modesto;
- City of Newman;
- Central Valley Regional Water Quality Control Board (two responses);
- Del Puerto Health Care District;
- Covanta;
- San Luis & Delta Mendota Water Authority;
- Ken Mustoe;
- Sierra Academy of Aeronautics;
- San Joaquin Valley Air Pollution Control District; and,
- Stanislaus County Environmental Review Committee.

The issues brought forth within each comment letter were evaluated in terms of environmental significance and in terms of technical amendments to the draft documents for clarification purposes. Comment letters with "no comments," or informational and/or supportive in nature, were likewise acknowledged in the response to comments. Response to all comment letters and revision to the DEIR are provided in the FEIR, Chapter 2 – Comments and Responses to Comments and Chapter 3 – Errata.

In response to the DEIR Comments received, the following revisions to the DEIR have been made, added and amended mitigation measures are reflected in the summary of mitigation measures provided above:

- Air emissions data has been updated;
- Air Quality Mitigation has been restructured to clarify phase equipment requirements;
- Air Quality Mitigation has been added to provide transit to the workplace;
- An expanded discussion of potential exposure to sensitive receptors due to emissions of toxic air contaminants from aircraft operations has been added;
- Hazards and Hazardous Materials Mitigation has been added to formalize the official route for trucking access to the Project applicable to large trucks (Fink Road/Interstate-5);
- Text discussion has been added to address: former oil pipelines; regulatory framework for groundwater sustainability agencies (GSAs); and County's General Plan language regarding Public Services;
- Traffic and Transportation Mitigation has been amended to include Phase 2 intersection improvements and roadway segment improvements on Highway 33;
- Utilities and Service Systems Mitigation has been amended to clarify the written documentation needed from City of Patterson regarding adequacy of WQCF and

fair-share contributions from the Specific Plan for wastewater treatment expansion;
- Intersection level of service tables have been updated; and,
- Minor text cleanup has been incorporated.

Certifying the FEIR includes finding that the EIR is adequate in terms of:

- Compliance with CEQA;
- Circulation for public review and comment;
- Response to comments;
- Identification of all significant environmental impacts;
- Incorporation of all feasible mitigation measures into the Specific Plan; and,
- Identification of significant and unavoidable environmental impacts.

Certification also includes findings that the FEIR has been reviewed and considered independently, that the FEIR reflects the independent judgment and analysis of Stanislaus County, and that no changes made to the Project or DEIR after circulation involve significant new information necessitating re-circulation. Certification of the EIR also requires the adoption of Findings and a Statement of Overriding Consideration, which finds that the substantial benefits resulting from the Project outweigh the identified unavoidable impacts and are acceptable based upon: changes or alterations incorporated into the project that avoid or substantially lessen the significant environmental effect; and/or specific economic, legal, social, technological, and/or other considerations, make infeasible the mitigation measures or project alternatives identified in the environmental impact report. The Findings and the Statement of Overriding Consideration are provided as Attachment 2 of this report and incorporated into the Staff Recommendations. The Mitigation Monitoring and Reporting Program, provided as Attachment 3 will be incorporated as Appendix L of the Project Specific Plan following EIR certification.

POLICY ISSUE:

Pursuant to the CEQA, the Board of Supervisors, as lead agency, is required to review and consider the EIR for the Project and find that the EIR has been prepared in compliance with Public Resources Code Section 21000 et seq.; the CEQA Guidelines, California Code of Regulations, Tile 14, Section 15000 et seq.; and the County's CEQA Guidelines and Procedures for the Implementation of CEQA.

FISCAL IMPACT:

The total cost of the AECOM contract to prepare the Specific Plan, Environmental Impact Report, and all infrastructure master plans and technical studies is $1,002,600 and is funded by an agricultural lease through the Crows Landing Air Facility budget.

As part of the Adopted Final Budget 2018-2019, the Board of Supervisors dedicated $22.9 million to support development of the Crows Landing Industrial Business Park. Of these funds, $20 million is assigned in General Fund Balance for Community Impact – Jobs/Crows Landing IP, while approximately $2.9 million is appropriated in the CEO – Crows Landing Air Facility budget. This funding will be used for Phase 1A of the Crows Landing Industrial Business Park. It is important to note that the $2.9 million budget appropriation was supported by transfer from the Economic Development Bank, and all future revolving loan payments, in the amount of $1.4 million, will also be designated to support the Crows Landing project.

BOARD OF SUPERVISORS' PRIORITY:

The recommended actions are consistent with the Boards' priority of *Delivery of Efficient Public Services and Community Infrastructure* and *Developing a Healthy Economy* through business park development and job creation objectives for the community.

STAFFING IMPACT:

Responsibility for implementation of the Project will be assumed by existing County staff.

CONTACT PERSON:

Keith Boggs, Assistant Executive Officer	(209) 652-1514
Angela Freitas, Planning and Community Development Director	(209) 525-6330

ATTACHMENT(S):*

1. Maps
2. Findings and Statement of Overriding Considerations
3. Mitigation Monitoring and Reporting Program
4. Final Environmental Impact Report

*****Please note that Attachments 1 - 3 are not included as part of this document.*****
To view Attachments 1 - 3 visit the Planning & Community Development Department located at 1010 10th Street, Suite 3400, Modesto, CA, 95354 or visit the Board of Supervisors' *website*.

STANISLAUS COUNTY
DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400
Modesto, California 95354

FILED

2018 OCT 30 PM 4:25

STANISLAUS CO. CLERK RECORDER

NOTICE OF DETERMINATION

Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code

---

State Clearinghouse Number: 2014102035

Project Title: Specific Plan, General Plan Amendment, & Rezone Application No. PLN2013-0091 - Crows Landing Industrial Business Park

Applicant Information: Stanislaus County, 1010 10th Street, Suite 3400, Modesto, CA 95354.

Project Location: Unincorporated western Stanislaus County, approximately one mile east of I-5 and south of the Patterson City limits, bounded by West Marshall Road to the north, Fink Road to the south, Bell Road to the east, and Davis Road and agricultural land to the west. (APN: 027-003-074, 075, 076, 077, 078, 079, 080; and 027-001-057, 058, 059).

Description of Project: 1,528-acre Specific Plan with a mix of industrial and business park uses, general aviation airport, aviation-related uses, public facilities, a multi-modal transportation corridor, and infrastructure with 14 million square feet of building space and the potential to generate approximately 14,500 jobs. Includes General Plan designation change from Agriculture to Specific Plan and rezone from A-2-40 (General Agriculture) to S-P(2) (Specific Plan); adoption of an Airport Layout Plan and Narrative Report; and an amendment to the County Airport Land Use Compatibility Plan (ALUCP) to provide new policies for this airport.

Name of Agency Approving Project: Stanislaus County **Board of Supervisors**

Lead Agency Contact Person: Rachel Wyse, Senior Planner **Telephone:** (209) 525-6330

This is to advise that the Stanislaus County **Board of Supervisors** on **October 30, 2018,** has made the following determinations related to the California Environmental Quality Act for the above described project:

1. The project **will** have a significant effect on the environment.
2. An **Environmental Impact Report** was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures **were** made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan **was** adopted for this project.
5. A statement of Overriding Considerations **was** adopted for this project.
6. Findings **were** made pursuant to the provisions of CEQA.

This is to certify that the EIR with comments and responses and record of proceedings, is available to the General Public @ http://www.stancounty.com/bos/agenda/2018/ or Stanislaus County Department of Planning and Community Development, 1010 10th Street, Suite 3400, Modesto, California 95354.

October 30, 2018
Dated

Rachel Wyse
Senior Planner

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

I:\Planning\Staff Reports\GPA\2013\GPA REZ PLN2013-0091 - Crows Landing Development Project\Public Hearings\BOS\EIR 10.30.18\Notice of Determination.docx

Crows Landing Industrial Business Park Specific Plan Final Environmental Impact Report

Certified by the Board of Supervisor on October 30, 2018

Prepared for:

Stanislaus County Planning & Community Development
1010 10th Street, Suite 3400
Modesto, CA 95354

Contact:

Rachel Wyse
Associate Planner
wyser@stancounty.com
(209) 525-6330

Prepared by:

AECOM
2020 L Street, Suite 400
Sacramento, CA 95811

J. Matthew Gerken, AICP
Project Manager

AECOM

60308966

TABLE OF CONTENTS

Page

APPENDICES

Tables

ACRONYMS AND ABBREVIATIONS

2014 RTP/SCS	2014 Regional Transportation Plan/Sustainable Communities Strategy
ACM	asbestos-containing materials
ADT	average daily traffic
ADWF	average daily wastewater flows
AEP	annual exceedance probability
AFY	acre feet per year
AIA	*Air Impact Assessment*
AIA	Airport Influence Area
ALUC	Airport Land Use Commission
ALUCP	Airport Land Use Compatibility Plan
ARARs	Applicable or Relevant and Appropriate Requirements
ARB	California Air Resources Board
ARC	Airport Reference Code
ATCT	air traffic control tower
Bay Area	San Francisco Bay Area
BMPs	Best Management Practices
BRAC	Base Closure and Realignment
C.F.R.	Code of Federal Regulations
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Officers Association
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFC	California Fire Code
CFR	Code of Federal Regulations
CLIBP	Crows Landing Industrial Business Park
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
COM Standards	City of Modesto Public Works Department Standard Specifications 2006
COM Wastewater Master Plan	City of Modesto Wastewater Collection System Master Plan, March 2000
COP	City of Patterson
County	Stanislaus County
CRHR	California Register of Historical Resources
CSAs	County Service Areas
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibels
DER	Department of Environmental Resources

DMGS	Delta-Mendota Groundwater Subbasin
DOF	California Department of Finance
Draft EIR	Draft Environmental Impact Report
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EDD	Employment Development Department
EIR	environmental impact report
ETL	Engineering Technical Letter
FAA	Federal Aviation Administration
Final EIR	Final Environmental Impact Report
FSEIR	Final Subsequent EIR
GHG	greenhouse gas
GRIA	Groundwater Resources Impact Assessment
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HC	hydrocarbon
HI	hazard indices
HRA	health risk screening assessment
I-	Interstate
ILRP	Irrigated Lands Regulatory Program
ISR	Indirect Source Review
JJ&A	Jacobson James & Associates, Inc.
kBtu	thousand British thermal unit
kWh	kilowatt-hours
KDSA	Kenneth D. Schmidt and Associates
LAFCO	Stanislaus Local Agency Formation Commission
LID	Low Impact Development
LOS	level-of-service
LTO	landing and take-off
LUCs	Land use controls
MCAG	Merced County Association of Governments
mgd	million gallons per day
MMBtu	million British thermal units
MMRP	Mitigation Monitoring and Reporting Program
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
MSA	Modesto Metropolitan Statistical Area
MT CO_2e	metric tons of carbon dioxide equivalent
MT CO_2e/yr	metric tons of carbon dioxide equivalent per year
NOP	notice of preparation
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	federal Occupational Safety and Health Administration
OVP	Old Valley Pipeline

PFF	Public Facilities Fees
PG&E	Pacific Gas & Electric Company
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particular matter less than or equal 2.5 microns in diameter
proposed project	Crows Landing Industrial Business Park Specific Plan
Recycled Water Policy	Water Quality Control for Recycled Water
ROD	Record of Decision
ROG	reactive organic gases
RTIF	Regional Transportation Impact Fee Program
RTP	Regional Transportation Plan
RWDs	reports of waste discharge
SCS	Sustainable Communities Strategy
SGMA	Sustainable Groundwater Management Act
SJCOG	San Joaquin Council of Governments
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLDMWA	San Luis & Delta-Mendota Water Authority
SO_X	sulfur oxides
Specific Plan	Crows Landing Industrial Business Park Specific Plan
SPTS	South Patterson Trunk Sewer
SR	State Route
STAA	Surface Transportation Assistance Act
StanCOG	Stanislaus Council of Governments
StaRT	Stanislaus Regional Transit
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TAOC	Tidewater Associated Oil Company
TAZs	traffic analysis zones
TDM	Transportation Demand Management
TID	Turlock Irrigation District
TIP	Transportation Infrastructure Plan
TIS	Traffic Impact Studies
TP	Transportation Policy
ULDC	Urban Levee Design Criteria
USACE	U.S. Army Corps of Engineers
VERA	Voluntary Emission Reduction Agreement
VMT	vehicle miles traveled
vpd	vehicles per day
Wallace Kuhl	Wallace Kuhl & Associates
WDRs	Waste Discharge Requirements
WHWD	Western Hills Water District
WQCF	Water Quality Control Facility
WSA	water supply assessment
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

Stanislaus County (County) directed the preparation of an environmental impact report (EIR) to evaluate the potential environmental effects of the proposed Crows Landing Industrial Business Park Specific Plan (hereafter "the proposed CLIBP," the "proposed project," or "the Specific Plan"), in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.).

1.1 INPUT ON THE DRAFT EIR

The County asked for input from federal, State, and local agencies; organizations; and members of the public regarding the issues that should be evaluated in the EIR. Prior to notice of preparation (NOP) circulation, the County held meetings with the Stanislaus County Alliance Worknet, local developers, regulatory agencies, districts, and stakeholders to gain input and help inform the project description included in the NOP. Issues explored during the meetings included an overall site vision, project-related challenges, and opportunities for regional infrastructure planning and other synergies.

The County issued the NOP for the Specific Plan on October 13, 2014, and comments were accepted for a 30-day period ending on November 13, 2014. The County held two public scoping meetings during the comment period. One meeting was held at the Crows Landing Fire Station, 22012 G Street in Crows Landing on October 23, 2014. An additional scoping meeting was held at the Patterson City Hall Council Chambers, 1 Plaza in Patterson, on October 30, 2014.

The Draft EIR (State Clearinghouse Number 2014102035) was received by the State Clearinghouse and circulated for a 45-day public review period from January 22 through March 12, 2018. After a request from the City of Patterson, the County extended the public review period by another 45 days, which concluded on April 26, 2018.

In accordance with Section 15088 of the CEQA Guidelines, the County, as the lead agency, has reviewed the comments received on the Draft Environmental Impact Report (Draft EIR) for the proposed project and has prepared written responses to the comments received.

1.2 ORGANIZATION OF THE FINAL EIR

The County prepared this Final EIR, which includes:

- A full list of agencies, organizations, and individuals that provided comments on the Draft EIR;
- Verbatim comments on the Draft EIR;
- Responses to comments on the Draft EIR; and
- Minor revisions to the Draft EIR detailed in Chapter 3 of this Final EIR.[1]

Chapter 2, "Comments and Responses to Comments on the Draft EIR" of this Final EIR includes Master Responses to address common themes repeated in the comment letters received on the Draft EIR. Chapter 2 of this Final EIR also includes the written and verbal comments received on the Draft EIR and responses to these

[1] Chapter 3, "Errata," includes only pages of the Draft EIR where revisions have been made, not the entire Draft EIR.

comments (as required by the CEQA Guidelines Section 15132). The range of responses include providing clarification on the Draft EIR, making factual corrections, explaining why certain comments may not warrant further response, or simply acknowledging the comment for consideration by decision makers when the comment does not relate to the adequacy of the EIR for addressing potential adverse physical environmental effects of the project.

In some instances, responses to comments may warrant modification of the text of the Draft EIR. In those cases, the text of the Draft EIR is revised and the changes compiled in Chapter 3, "Errata" of this Final EIR. The text deletions are shown in strikeout (~~strikeout~~) and additions are shown in underline (<u>underline</u>). The revisions summarized in Chapter 3 of this Final EIR do not change the findings presented in the Draft EIR.

This document and the Draft EIR together constitute the Final EIR that the County Board of Supervisors will consider.

1.3 USE OF THE FINAL EIR

The Final EIR allows the public and the County decision makers an opportunity to review revisions to the Draft EIR and the Responses to Comments. The Final EIR serves as the environmental document to inform the Board of Supervisor's consideration of the proposed project, either in whole or in part, or one of the alternatives to the project discussed in the Draft EIR.

As required by Section 15090(a)(1)-(3) of the CEQA Guidelines, a lead agency, in certifying a Final EIR, must make the following three determinations:

1. The Final EIR has been completed in compliance with CEQA.
2. The Final EIR was presented to the decision-making body of the lead agency, and the decision-making body reviewed and considered the information in the Final EIR prior to approving the project.
3. The Final EIR reflects the lead agency's independent judgment and analysis.

As required by Section 15091of the CEQA Guidelines, no public agency shall approve or carry out a project for which an EIR has been certified that identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings (Findings of Fact) for each of those significant effects, accompanied by a brief explanation of the rationale for each finding supported by substantial evidence in the record. The possible findings are:

1. Changes or alterations have been required in, or incorporated into the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.
2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

2 COMMENTS AND RESPONSES TO COMMENTS

This section of the Final EIR contains comment letters received during the public review period for the Draft EIR.

The Final EIR contains comment letters received during the 90-day public review period for the Draft EIR, which concluded on April 26, 2018. In conformance with CEQA Guidelines Section 15088(a), the County has prepared written responses to all comments that address environmental issues related to the Draft EIR. The County's responses to comments focus on the disposition of significant environmental issues, as specified by Section 15088(c) of the CEQA Guidelines.

2.1 LIST OF COMMENTERS

Table 2-1 identifies a number for each comment letter received, the author of the comment letter, and the date received. Each comment letter is included in its entirety for decision maker consideration before each response.

Table 2-1 Comments Received on the Draft EIR

Letter #	Commenter	Date Received
1	California Northern Railroad	February 23, 2018
2	Central Valley Regional Water Quality Control Board #1	February 28, 2018
3	Covanta Stanislaus	February 28, 2018
4	Central Valley Regional Water Quality Control Board #2	March 5, 2018
5	City of Patterson #1	March 6, 2018
6	City of Patterson #2	April 26, 2018
7	Chevron	March 6, 2018
8	San Joaquin Valley Air Pollution Control District	March 6, 2018
9	California Department of Transportation	March 7, 2018
10	Sierra Academy of Aeronautics	March 9, 2018
11	Stanislaus County Environmental Review Committee	March 9, 2018
12	City of Modesto	March 23, 2018
13	Del Puerto Health Care District	April 17, 2018
14	City of Newman	April 24, 2018
15	Northern Delta Mendota	April 26, 2018
16	Ken Mustoe	Date Not Provided

Each comment related to the adequacy of the Draft EIR for addressing potential adverse physical environmental effects is addressed either in one of the master responses, provided below in Section 2.2, or in the individual responses, provided below in Section 2.3, or both.

This page intentionally left blank

2.2 MASTER RESPONSES

The County has identified some subjects that were raised in multiple comment letters or more than once in the same comment letter. Rather than provide individual responses to each of these comments, and in addition to cross-referencing between letters, the Final EIR provides "master responses" that address all aspects of frequently mentioned topics. By responding in this manner, the County is better able to address all aspects of the topic by:

- Avoiding unnecessary repetition in individual responses, and
- Addressing issues in a broader context than might be provided in response to by individual comments.

By addressing comments in this broader context, the County is able to provide a more comprehensive response, identify relationships among some of the topics raised, and offer greater clarification than would be possible by addressing only individual comments. The following topics are addressed by the master responses:

- Master Response 1, EIR Analysis
- Master Response 2, Future Mitigation Requirements

2.2.1 MASTER RESPONSE 1, EIR ANALYSIS

Some commenters raised concerns that the project description of the Draft EIR inadequately described the Specific Plan land uses and objectives. Some commenters expressed the belief that the Draft EIR did not use the most recent and applicable data available, which caused the County to: underestimate impacts to wastewater treatment, air quality, and traffic; inadequately analyze the impacts of increased groundwater use, wastewater generation and treatment, water supply demand, air quality and greenhouse gas emissions, aircraft operations and noise exposure, and local and regional traffic; and inadequately specify feasible mitigation for those impacts.

Some commenters stated that the Draft EIR did not evaluate a reasonable range of feasible alternatives to reduce the severity of impacts due to implementation of the Specific Plan. Some commenters raised concerns that the Draft EIR did not address the cumulative and growth-inducing impacts from the potential creation of 14,000 to 15,000 jobs.

The County sought input on the Draft EIR through issuance of a Notice of Preparation (NOP) of a DEIR, as discussed on pages 1-4 through 1-7 of the Draft EIR. The NOP was circulated to solicit input on the scope of analysis for the Draft EIR from responsible and trustee agencies, federal agencies and the public. The NOP included a project description, and requested that affected agencies and the public provide input regarding the overall scope and content of the Draft EIR. Prior to NOP circulation, the County held meetings with the Stanislaus County Alliance Worknet, local developers, regulatory agencies, districts, and stakeholders to gain input and help inform the project description included in the NOP. Issues explored during the meetings included an overall site vision, project-related challenges, and opportunities for regional infrastructure planning and other regional benefits.

The County also held two public scoping meetings during the NOP comment period – one in Crows Landing (near the project site) and one at Patterson City Hall. In preparing the EIR, the County reviewed all of the comments received as a part of this outreach and all of the comments received during the NOP comment period are included in the Draft EIR as Appendix A and summarized on pages 1-5 through 1-7 of the Draft EIR. Each comment that relates to a potentially significant adverse physical environmental impact of the project is addressed in the Draft EIR.

The project scope is presented and discussed throughout Draft EIR Chapter 2, “Project Description,” as required by CEQA Guidelines Section 15124(a)–(d). The Draft EIR project description contains detailed text and exhibits to illustrate the proposed project location (page 2-1, Exhibits 2-1 and 2-2); project background and history (pages 2-1 and 2-4); project objectives (pages 2-4 and 2-5); a summary of the project’s technical, economic, and environmental characteristics including supporting infrastructure (pages 2-5 through 2-21, Exhibits 2-3 and 2-4); and project phasing (pages 2-21 through 2-24, Exhibit 2-5).

Pursuant to the CEQA Guidelines, an EIR project description should contain the location and boundaries of the proposed project by way of a map; a description of the project's technical, economic, and environmental characteristics; and a statement briefly describing the intended use of the EIR (CEQA Guidelines Section 15124[a]-[d]). The project description “should not supply extensive detail beyond that needed for evaluation and review of the environmental impact” (CEQA Guidelines Section 15124). A general conceptual discussion of the main features of the project is sufficient (CEQA Guidelines Section 15124[a], [c]).

Chapter 2, “Project Description” of the Draft EIR contains extensive detail in an accurate, stable, and finite project description that presents the scope of the proposed project and includes all of the components identified in CEQA Guidelines Section 15124. Chapter 2 includes maps to identify the location of the proposed project and a description of the project components. The project description identifies the long background and history of the proposed project, project objectives, the Specific Plan Area and surrounding land uses, proposed land uses, their location and phasing, substantial detail on planned infrastructure improvements to serve buildout of the Specific Plan Area, and the actions required to implement the Specific Plan. Appendices to the Draft EIR contain the proposed airport facilities and airport-land use compatibility plan.

The Draft EIR evaluates the full range of environmental topics areas, including the checklist questions identified in Appendix G of the CEQA Guidelines (DEIR Sections 3.1 through 3.15). These consist of Aesthetics (Section 3.1), Air Quality (Section 3.2), Agricultural Resources (Section 3.3), Biological Resources (Section 3.4), Cultural Resources (Section 3.5), Energy (Section 3.6), Greenhouse Gas Emissions (Section 3.7), Geology/Soils/Minerals/ Paleontological Resources (Section 3.8), Hazards and Hazardous Materials (Section 3.9), Hydrology and Water Quality (Section 3.10), Land Use and Planning/Population/Housing/Employment (Section 3.11), Noise and Vibration (Section 3.12), Public Services (including Recreation) (Section 3.13), Traffic and Transportation (Section 3.14), and Utilities and Service Systems (Section 3.15).

Draft EIR Section 3.11, “Land Use and Planning and Population, Housing, and Employment,” contains an extensive discussion of anticipated growth in the region, including temporary and permanent population growth related to buildout of the proposed Specific Plan and other planned development in the region following the creation of 14,000 to 15,000 jobs (see, in particular, pages 3.11-18 through 3.11-21). As described in Section 3.11, it is not possible to determine the specific locations or extent of possible future residential development associated with project-related employment; however, the mitigation measures presented in Section 3.11 and throughout the Draft EIR directly and thoroughly address the environmental issues associated Specific Plan buildout and specifically identify how potential impacts can be avoided or minimized. However, the Draft EIR concluded that no feasible mitigation is available to reduce the impacts associated with temporary and permanent population growth to a less-than-significant level without changing the purposes of the proposed Specific Plan; therefore, the impact is considered significant and unavoidable (page 3.11-2 of the Draft EIR).

Draft EIR Chapter 4, "Alternatives," evaluates a range of reasonable alternatives to the project, as required by CEQA Guidelines Section 15126.6, and Chapter 5, "Other CEQA Considerations" included a comprehensive analysis of cumulative impacts (CEQA Guidelines Section 15130), growth-inducing impacts (CEQA Guidelines Section 15126.2[d]), significant irreversible environmental changes (CEQA Guidelines Section 15126.2[c] and 15127), and significant and unavoidable effects (CEQA Guidelines Section 15216.2[b]) that could be associated with the proposed project.

Draft EIR Section 5.1, "Cumulative Impacts," addresses the cumulative impacts associated with Specific Plan implementation for each resource topic included in Chapter 3, considered on a geographic scale that extends beyond the project site (see pages 5-1 through 5-42 of the Draft EIR). The Draft EIR used a "plan approach," as provided for in CEQA Guidelines Section 15130(b)(1)(B), to evaluate the cumulative effect of environmental impacts associated with the proposed project when combined with the environmental impacts associated with a summary of projections identified in adopted local, regional or statewide plans, or planning documents.

The Stanislaus Council of Governments (StanCOG) prepared an EIR to examine the impacts of land use change assumed under the 2014 Regional Transportation Plan/Sustainable Communities Strategy (2014 RTP/SCS; State Clearinghouse Number 2013012012). The StanCOG EIR helped to establish the cumulative context for the proposed project. The cumulative analysis in this EIR considers the 2014 RTP/SCS land use change assumptions that were developed at the regional level, and includes land use changes in San Joaquin, Merced, and Stanislaus counties (both incorporated and unincorporated areas) (see pages 5-2 and 5-3 of the Draft EIR).[1] The Stanislaus County General Plan, which identifies land use changes throughout the county, including areas around cities and in the unincorporated communities, was also used to establish a context for the cumulative analysis (see page 5-3 of the Draft EIR). The cumulative impact analysis is presented on pages 5-5 through 5-42 of the Draft EIR. Consistent with CEQA Guidelines Section 15064(h), the Draft EIR:

- explains the context for the cumulative impact analysis,
- identifies whether there are significant cumulative impacts associated with implementing the referenced regional plans,
- evaluates the project's incremental contribution to significant cumulative impacts, and
- determines whether the project's incremental contribution to any significant impact is cumulatively considerable.

Draft EIR Section 5.2, "Growth Inducing Impacts," considers growth inducement associated with Specific Plan implementation (see pages 5-42 and 5-43). The Section 5.2 analysis considers the direct and indirect growth that would result from project-related temporary and permanent employment opportunities; the need for additional housing and services to support the new temporary employment demand; and whether the project would remove obstacles to additional growth and development, such as expanding public utilities or other public services to an area that was previously not served.

[1] After publication of the Draft Crows Landing Specific Plan and Draft EIR, StanCOG developed and released for public review a 2018 update to the RTP/SCS and programmatic EIR. This plan has not been adopted as of the writing of this document.

The Draft EIR contains an extensive discussion of the potential indirect growth inducement from the potential creation of 14,000 to 15,000 jobs within the Specific Plan Area. The Draft EIR analysis considers land use change in San Joaquin County and Merced County, as well as Stanislaus County, including unincorporated Stanislaus County, as well as development in the cities of Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock, and Waterford (see page 5-3 of the Draft EIR). As described in Appendix J of the RTP/SCS, between 2020 and 2040 the countywide population is projected to increase by 169,914, the city of Newman is projected to increase by 5,318, the city of Patterson is projected to increase by 15,749, the city of Turlock is projected to increase by 26,826, and the unincorporated County is projected to increase by 23,820 (StanCOG 2012).[2] With regard to countywide employment, the increase between 2020 and 2040 is projected to be 51,499, of which 17,757 would be in unincorporated areas. For the city of Newman, the increase is projected to be 515. For the city of Patterson, the increase is projected to be 7,004. For the city of Turlock, the increase is projected to be 8,008.[3] The increase in housing units, between 2020 and 2040 is projected to be 62,147 countywide, 1,801 in the city of Newman, 5,125 in the city of Patterson, 9,693 in the city of Turlock, and 9,125 in the unincorporated areas of the County.

Based on StanCOG's forecast and the current labor force participation rate, adding 169,914 people between 2020 and 2040 would increase the labor force by approximately 74,372 (StanCOG 2012, EDD 2018).[4,5] However, the employment growth in the County during the same period is only forecast to be 51,499, which leaves a gap of 22,873 jobs needed to balance population growth with growth in the local labor force. Employment generating projects such as the Specific Plan could help to better balance residential and employment growth in the county, although, as explained in the Draft EIR, it is not possible to determine with certainty the specific location of new residences for the future employees of the Specific Plan. Some future employees of the Specific Plan may live in existing housing and some may live in housing to be constructed in the future. Some employees may choose to live a short distance from the Specific Plan Area, while others may choose to live a greater distance from their future workplace.

In June of 2018, the unemployment rate in Stanislaus County was estimated to be 7.2 percent, which is 60 percent higher than the state as a whole, and more than 70 percent higher than the nation as a whole (EDD 2018).[6] There are approximately 17,500 unemployed people in the labor force in Stanislaus County. While the County cannot control or predict where future employees of the new uses provided for in the Specific Plan will reside, the addition of jobs in Stanislaus County could help address the continued relatively high local unemployment rate. As of 2018, the city of Patterson has a housing vacancy rate of 9.6 percent, which is the highest housing vacancy rate of any city in Stanislaus County, and the rate is higher than the unincorporated county and the county as a whole (DOF 2018).[7] To the extent that buildout of the Specific Plan would create the need for housing in the region, the existing high vacancy rate in Patterson could be helpful in filling a portion of this need. The vacancy

---

2 Stanislaus Council of Governments (StanCOG). 2012 (March 27). Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Appendix J, Regional Demographic Forecast.

3 Since the Draft EIR was published, StanCOG released a new demographics report for the ongoing draft SCS update, which shows similar employment increases countywide between 2020 and 2045 as those reported for 2020-2040 previously: 47,760 new employees between 2020 and 2045.

4 Stanislaus Council of Governments (StanCOG). 2012 (March 27). Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Appendix J, Regional Demographic Forecast.

5 Employment Development Department (EDD). Modesto Metropolitan Statistical Area (MSA) (Stanislaus County). Available online: http://www.labormarketinfo.edd.ca.gov/file/lfmonth/mode$pds.pdf.

6 Employment Development Department (EDD). Modesto Metropolitan Statistical Area (MSA) (Stanislaus County). Available online: http://www.labormarketinfo.edd.ca.gov/file/lfmonth/mode$pds.pdf.

7 California Department of Finance (DOF). 2018 (May). E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2018 with 2010 Census Benchmark. Available online: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

rate for Turlock is 5.6 percent, for Newman is 8.6 percent, for the unincorporated county is 7.4 percent, and for the county as a whole is 7.0 percent (DOF 2018).

Approximately 44 percent of the County's total population is in the labor force. Assuming the current labor force participation rate, 15,000 employees would generate a population of approximately 34,270. Assuming the County's current average household size, to house a total population of 34,270 would require approximately 11,220 housing units. Between 2020 and 2040, according to the RTP/SCS, Patterson, Newman, and the unincorporated County are forecast to add approximately 16,000 housing units.[8] When Turlock is added, the total is 25,744 housing units added between 2020 and 2040. The Stanislaus County regional housing needs allocation represents the amount of housing that the County and cities need to plan for, along with the affordability of planned housing units. The 2014-2023 regional housing needs allocation for the StanCOG region is 21,330 housing units. The total need for Newman, Patterson, Turlock, and the unincorporated area is 9,128 during this period, or 913 units per year (Stanislaus County 2016).[9] Applying this annual rate of housing need to the years from 2020 to 2040, during which the Specific Plan is anticipated to build out,[10] yields a total of 18,256 housing units. As the Specific Plan builds out, the County and these cities will be planning for housing in excess of what would be necessary to house employees of the Specific Plan Area.

The analysis of growth-inducing impacts is distinct from the analysis in the individual impact chapters. This is because creating demand for growth does not in and of itself cause a direct physical impact; only a proposed project at a specific location would create physical impacts. As stated in *Napa Citizens for Honest Government v. Napa County Bd. of Supervisors*, 91 Cal. App.4th at p. 20 (2001), the growth-inducing effects of proposed projects should be acknowledged, but discussed in less detail than direct effects resulting from projects (also see *Defend the Bay*, 119 Cal.App.4th at pp. 1261, 1266 ["If a project will create jobs and bring people into the area, the EIR must discuss the resulting housing needs, but not in minute detail. It is enough to identify the housing required and its probable location"]). The Draft EIR contains an extensive discussion related not only to potential future housing needs, but also to the direct and indirect growth-inducing effects of the Specific Plan. When considered together, Chapters 3, 4, and 5 provide detailed analyses related to the project's environmental setting, applicable regulatory context, and potential impacts on the environment, which are based on substantial evidence, including facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines Section 15384). The Draft EIR for the Specific Plan provides an adequate, complete, and good-faith effort at full disclosure of the physical environmental impacts, and the conclusions in the Draft EIR are based on substantial evidence in light of the whole record (CEQA Guidelines Section 15151). The Draft EIR provides a thorough and accurate analysis of the potentially significant environmental impacts of the Specific Plan (CEQA Guidelines Section 15126).

2.2.2 MASTER RESPONSE 2, FUTURE MITIGATION REQUIREMENTS

Some commenters raised concerns that some of the mitigation measures provided the Draft EIR are impermissibly deferred. In particular, some commenters expressed that the some of the mitigation measures designed to reduce

8 The updated 2018 demographics report from StanCOG shows a similar estimate for housing unit growth between 2020 and 2045 – a total of 14,541.

9 Stanislaus County. 2016 (April). 2015-2023 Housing Element Update. Available online: http://www.stancounty.com/planning/pl/gp/gp-chapter6-housing-element.pdf.

10 The estimated buildout of the Specific Plan is 2046, but the actual pace of development will depend on market conditions. Examining possible housing needs related to Specific Plan employment through 2040 is "conservative," since the Specific Plan is not anticipated to be built out by 2040.

the proposed project's impacts related to public services and utilities, geologic hazards, hazardous materials, and flooding, among other topic areas, improperly deferred the formulation of precise mitigation and, therefore, rendered the associated impact conclusions invalid.

As a general matter, mitigation measures should not be deferred until some future time after project approval. However, mitigation measures may specify performance measures that may be accomplished in more than one specified way (CEQA Guidelines, California Code of Regulations [CCR] Section 15126.4 [a][1][B]). As explained in CEQA Guidelines Section 15004(b), choosing the precise time for CEQA compliance involves a balancing of competing factors. An EIR should be prepared as early as feasible in the planning process to enable environmental considerations to influence project program and design and yet late enough to provide meaningful information for environmental assessment. The environmental document preparation and review should be coordinated with the existing planning, review, and project approval processes being used by each public agency. These procedures, to the maximum extent feasible, are to run concurrently, not consecutively (CEQA Guidelines Sections 15004[c]).

Courts have developed legal principles regarding the extent to which an agency may rely on a mitigation measure that defers some amount of environmental problem-solving until after project approval. In particular, deferral is permissible when an adopted mitigation measure commits the agency to a performance standard that would ensure that the mitigation of the significant effect or lists alternative means of mitigating an impact that must be considered, analyzed, and possibly adopted in the future:

> "…measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way" *Endangered Habitats League v. County of Orange* (2005) 131 Cal.App.4th 777, 793-794

> "…deferral is permissible where the agency commits itself to mitigation and either (1) adopts a performance standard and makes further approvals contingent on finding a way to meet the standard or (2) lists alternative means of mitigating the impact which must be considered, analyzed, and possibly adopted in the future" *Riverwatch v. County of San Diego* (1999) 76 Cal.App.4th 1428, 1448–1450

> "…a deferred approach may be appropriate where it is not reasonably practical or feasible to provide a more complete analysis before approval and the EIR otherwise provides adequate information of the project's impacts" *Sacramento Old City Assn. v. City Council* (1991) 229 Cal.App.3d 1011, 1029-1029; *Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, 1275

The County has reviewed and incorporated this guidance into the Draft EIR, where appropriate. The use of performance standards is particularly appropriate for proposed Specific Plan EIRs and other EIRs that govern future projects, such as Crows Landing:

> "[F]or kinds of impacts for which mitigation is known to be feasible, but where practical considerations prohibit devising such measures early in the planning process (e.g., at the general plan amendment or rezone stage), the agency can commit itself to eventually devising measures that will satisfy specific performance criteria articulated at the time of project approval. Where future action to carry a project forward is contingent on devising means to satisfy such criteria, the agency should be able to rely on its commitment as evidence that significant impacts will in fact be mitigated" *Sacramento Old City Assn. v.*

City Council (1991) 229 Cal.App.3d 1011, 1029-1029 at pp. 1028-1029; *Rio Vista Farm Bureau Center v. County of Solano* (1992) 5 Cal.App.4th 351

Consistent with the guidance summarized above, the mitigation measures identified in the Draft EIR contain performance standards to ensure the efficacy and enforceability of the mitigation measures (*Endangered Habitat League, supra*, 131 Cal.App.4th at pp. 793-794). The following are examples of mitigation measures from the Draft EIR that include enforceable performance standards:

- Air Quality Mitigation Measures 3.2-3a and 3.3-2b are proposed to minimize potential exposure of sensitive receptors to Toxic Air Contaminants (TACs) associated with future operations in the Specific Plan Area. Mitigation Measure 3.2-3b ensures that projects proposed within 1,000 feet of an existing daycare or an off-site residence are required to analyze and report on potential health-risk impacts of $PM_{2.5}$ and TAC concentrations from long-term operations prior to the issuance of a building permit for new construction, tenant improvement, or change of use. If health risk impacts are determined to exceed quantified Air District thresholds of significance under any potential operational exposure scenario, projects shall implement Mitigation Measure 3.2-3c, which requires identification and implementation of strategies to reduce impacts below applicable quantified Air District thresholds of significance.

- Hydrology and Water Quality Mitigation Measure 3.10-4b is proposed to implement a groundwater level monitoring program and curtail pumping of nearby Specific Plan Area wells if drawdown is observed in excess of 5 feet near an existing off-site domestic well. More specifically, Mitigation Measure 3.10-4b requires the County to coordinate with the Groundwater Sustainability Agency to conduct groundwater monitoring as a part of implementation of the Groundwater Sustainability Plan for the vicinity of the Specific Plan Area. Groundwater level monitoring activities, findings, and a reporting schedule will also be defined in the Groundwater Sustainability Plan, along with the Minimum Thresholds and Measurable Objectives required in a Groundwater Sustainability Plan that govern when investigation and intervention is required and what adjustments to well field operation or other actions are required to avoid effects to existing off-site wells.

- Utility and Service System Mitigation Measure 3.15-4 requires the County to demonstrate adequate wastewater treatment capacity prior to issuing any building permit for any project proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the Western Hills Water District sewer line. The mitigation requires written documentation to verify that existing treatment capacity is, or will be, available to support the proposed development and that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy. Projects developed under the Specific Plan will be required to pay fair-share fees to the City of Patterson for wastewater treatment.

The fact that certain policies and programs do not include detailed site-specific information on how the policy or program will be implemented is attributable to the nature of this project, which is a Specific Plan. The degree of specificity in an EIR will correspond to the degree of specificity in the underlying action (CEQA Guidelines Section 15146 and subdivision [b]). CEQA Guidelines Section 15152 also acknowledges that "not all effects can be mitigated at each step of the process. There will be some effects for which mitigation will not be feasible at an early step of approving a particular development project."

The extent to which some of the proposed mitigation measures are general in nature reflects the fact that the proposed project is a Specific Plan Area for a 1,528-acre plan area with an estimated 30-year buildout. Pursuant to CEQA statutes, guidelines, and case law, the specificity of the mitigation measures identified in a Draft EIR should correspond to the specificity of the proposed project (*Rio Vista Farm Bureau Center, supra,* 5 Cal.App.4th at p. 376). If the proposed Crows Landing Specific Plan is adopted, the mitigation measures will be adopted and incorporated into the Specific Plan and the County would be committed to implementing the Specific Plan EIR mitigation measures and performance standards within the context of future applications for tentative subdivision maps, use permits, and other entitlement and permits.

2.3 COMMENTS AND RESPONSES ON THE DRAFT EIR

The written comments received on the Draft EIR and the responses to those comments are provided in this section. Similar comments are provided with a categorical response. Each comment letter is reproduced in its entirety. Responses to comments follow the comment letters. Where a commenter has provided multiple comments, each comment is indicated by a line bracket and an identifying number in the margin of the comment letter. The Final EIR considers comment letters shown in Table 2-1 and provides text changes, where appropriate, shown in ~~strikethrough~~ for deleted text and underlined for corrected and/or clarified changed text.

2.3.1 LETTER 1. CALIFORNIA NORTHERN RAILROAD, DATED FEBRUARY 23, 2018

Letter 1

Rachel Wyse - Crow Landing Industrial Business Park SCH#2014102035

From:	"Boles, Kevin"
To:	Stan County Planning
Date:	2/23/2018 9:43 AM
Subject:	Crow Landing Industrial Business Park SCH#2014102035
CC:	"John Mollart", "Kennix, Marvin L.
Attachments:	CFNR Crows Landing Business Park Response.pdf

Hello,

Attached please find the California Northern Railroad's comments on the proposed project.

Kevin Boles |Project Manager – Xorail, Inc.
San Francisco/ Bay Area

Xorail
A Wabtec Company
http://www.xorail.com
http://www.wabtec.com

Dedicated to providing the railroad industry with the highest quality, time-responsive and cost-competitive construction and engineering solutions for: signal and communications systems; project, data and configuration management services and tools, and; systems integration for communications-based positive train control.

a Genesee & Wyoming Company

February 23, 2018

Rachel Wyse
Stanislaus County Planning

RE: Crows Landing Industrial Business Park, SCH# 2014102035

Dear Ms. Wyse:

The California Northern Railroad operates freight rail service adjacent to the proposed project site, and recommends that any development projects planned adjacent to or near the rail corridor be planned with the safety of the rail corridor in mind. New developments may increase traffic volumes not only on streets and at intersections, but also at at-grade highway-rail crossings. 1-1

Safety factors to consider include upgrades to existing railroad crossing warning devices both for vehicular traffic on the street and pedestrian traffic on the sidewalk, modifications to traffic control devices at highway-highway intersections near the highway-rail crossing such as installing traffic signals or adding protected left turn signal phases, etc.) due to increase in traffic volumes.

The project

The project could impact the following existing at-grade highway-rail crossings:
- Marshall Road 1-2
- 5^{th} Street
- Fink Road

The above-mentioned safety improvements should be considered when approval is sought for the new development. Working with railroad staff early in the conceptual design phase will help improve the safety to motorists and pedestrians. 1-3

If you have any questions in this matter, please call me.

Sincerely,

John Mollart
Regional Signal Manager
California Northern Railroad

Cc: Marvin Kennix, CPUC

Response to Comment Letter 1 – California Northern Railroad

Response to Comment 1-1

At the time of the traffic study, it is understood that there was approximately one train per day on the section of railroad near the Specific Plan Area, or two crossings of the public roads. The comment does not raise specific questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. However, this comment is published in this Response to Comments document for public disclosure and decision maker consideration.

Response to Comment 1-2

The three crossings identified in the comment all currently have automatic crossing protection devices. Marshall Road and Fink Road (Crows Landing Road) are each protected by automatic railroad crossing gates and flashing lights, while 5th Street is protected by post-mounted automatic flashing lights. Given the low train activity, the existing protection facilities are considered adequate protection devices.

The comment does not raise specific questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. However, this comment is published in this Response to Comments document for public disclosure and decision maker consideration.

Response to Comment 1-3

As requested, the County will work with California Northern Railroad staff to identify any necessary safety features in the future when specific project improvements plans are brought forward for approval that would affect the railroad.

2.3.2 LETTER 2, CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD #1, DATED FEBRUARY 28, 2018

Letter 2

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

clear 3/7/18

28 February 2018

Governor's Office of Planning & Research

MAR 05 2018

STATE CLEARINGHOUSE

Rachel Wyse
Stanislaus County
Planning and Community Development

CERTIFIED MAIL
91 7199 9991 7035 8419 4485

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, SPECIFIC PLAN, GENERAL PLAN AMENDMENT AND REZONE APPLICATION NO. PLN2013-0091 – CROWS LANDING INDUSTRIAL BUSINESS PARK PROJECT, SCH# 2014102035, STANISLAUS COUNTY

2-1

Pursuant to the State Clearinghouse's 27 January 2018 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environment Impact Report* for the Specific Plan, General Plan Amendment and Rezone Application No. PLN2013-0091 – Crows Landing Industrial Business Park Project, located in Stanislaus County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

2-2

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). 2-2 Cont'd

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process. 2-3

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. 2-4

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

2-4 Cont'd

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program. There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/for_growers/apply_coalition_group/index.shtml or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov. 2-5

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently $1,084 + $6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

If you have questions regarding these comments, please contact me

Stephanie Tadlock

Stephanie Tadlock
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Response to Comment Letter 2 – Central Valley Regional Water Quality Control Board

Response to Comment 2-1

The comment is noted. See responses to specific comments contained in Response to Comments 4-2 through 4-5.

Response to Comment 2-2

Draft EIR subsection 3.10.2 "Regulatory Framework," in Section 3.10, "Hydrology and Water Quality," (pages 3.10-15 through 3.10-27) discusses numerous federal, State, and local laws, ordinances, regulations, and policies that pertain to the control of water quality, including the Basin Plan (pages 3.10-18 and 3.10-19), Clean Water Act (pages 3.10-15 through 3.0-17), Porter-Cologne Water Quality Control Act (page 3.10-18), and the State's Antidegradation Policy (page 3.10-19). The requirements of the Construction General Permit for development of a SWPPP and associated Best Management Practices (BMPs) are discussed on pages 3.10-16, 3.10-20, and 3.10-21 of the Draft EIR.

In addition, Draft EIR Mitigation Measure 3.10-1b (pages 3.10-29 and 3.10-30) requires the County to prepare a SWPPP and implement BMPs that would reduce the potential for runoff and the release, mobilization, and exposure of pollutants from project-related construction activities.

Response to Comment 2-3

The MS4 permit requirements are described in Draft EIR subsection 3.10.2 "Regulatory Framework," in Section 3.10, "Hydrology and Water Quality," (pages 3.10-21 and 3.10-22). Landowners are responsible for applying for coverage under the permit and complying with permit requirements, but may delegate specific duties to developers and contractors by mutual consent. Permit applicants are required to prepare and implement a SWPPP that describes the site; erosion and sediment controls; means of waste disposal; implementation of local plans; control of post-construction sediment and erosion control measures and maintenance responsibilities; and non-stormwater management control.

Draft EIR Mitigation Measure 3.10-1b (pages 3.10-29 and 3.10-30) requires the County to prepare a SWPPP and implement BMPs that would reduce the potential for runoff and the release, mobilization, and exposure of pollutants from project-related construction activities. Draft EIR Mitigation Measure 3.10-3b (pages 3.10-38 through 3.10-40) requires the County to prepare and implement a long-term site-specific operational stormwater quality management plan that includes LID design features; BMPs to reduce generation of on-site pollutants and for stormwater pre-treatment; volumetric hydraulic sizing design criteria; and flow-based hydraulic sizing design criteria. In addition, any future leaseholder within a project site that includes a land use with a high-risk pollutant discharge source must provide additional site-specific treatment to address pollutants of concern prior to the flow reaching the infiltration facility, and must prepare a site-specific operational stormwater quality management plan for submittal to the County.

Response to Comment 2-4

The County agrees that leaseholders within the project site that are associated with industrial land uses are required by law to obtain permits and comply with the regulations contained in the *Industrial Storm Water General Permit* Order No. 2014-0057-DWQ. Furthermore, Draft EIR Mitigation Measure 3.10-3b (page 3.10-40) requires that any future leaseholder within a project site that includes a land use with a high-risk pollutant discharge source must provide additional site-specific treatment to address pollutants of concern prior to the flow reaching the infiltration facility, and must prepare a site-specific operational stormwater quality management plan for submittal to the County.

Response to Comment 2-5

The ILRP is discussed in Draft EIR subsection 3.10.2 "Regulatory Framework," in Section 3.10, "Hydrology and Water Quality," (pages 3.10-19 and 3.10-20). As discussed in Draft EIR Chapter 2, "Project Description," (pages 2-11 through 2-16) the project site would be developed with urban land uses and associated landscaping and supporting infrastructure. As discussed in Draft EIR Impact 3.10-3 (pages 3.10-37 and 3.10-38), some existing agricultural land uses may continue as the various project phases are developed over a 30-year build-out period, but all agricultural land uses would eventually be phased out. The existing agricultural land uses already have permits under the ILRP, and they would continue to operate under these permits in the future as long as the existing on-site agricultural operations are carried out.

2.3.3 LETTER 3, COVANTA STANISLAUS, DATED FEBRUARY 28, 2018

Letter 3

Stanislaus County Planning and Community Development Department
Rachel Wyse, Senior Planner

February 28, 2018

RE: Support for Crows Landing Industrial Business Park

Dear Ms. Wyse:

On behalf of the Stanislaus Resource Recovery Facility, otherwise known as Covanta Stanislaus, we fully support the Crows Landing Industrial Business Park Project (CLIBP). We believe that the CLIBP presents a progressive business plan which would not only benefit the Central Valley's economy, but also bolster its economic resilience, quality of life and sustainability objectives. It is precisely because of these benefits that the CLIBP is well positioned to attract domestic and international investment within the community for the benefit of the community.

What's more, as the trend toward re-patriating off shore businesses and manufacturing entities advances, the CLIBP stands to provide an advantageous industrial business park complex for new investment.

In addition, Covanta Stanislaus would like to offer for consideration the opportunity to supply dependable, clean industrial quality steam and/or electricity for the CLIBP and its clients. Covanta Stanislaus' generated energy would provide numerous benefits for the project, its clients and the community. 3-1

Sustainability is now more important than ever with Europe, the United States and other countries listing it as a top consideration – especially when expanding abroad. It's also high on the site selection criteria list at both the residential level and for specific locations considered for commercial investment. As a result, the management of wastes and materials has become a rapidly rising focus for major companies.

As a matter of fact, during a recent review of over 80 S&P 500 sustainability reports, we found that over 90 percent had a waste and materials management sustainability goal – and for good reason. The United States Environmental Protection Agency (EPA) has found that the full lifecycle of materials management, including the provision of goods and food, is responsible for 42 percent of U.S. greenhouse gas (GHG) emissions.[i]

EPA Waste Management Hierarchy

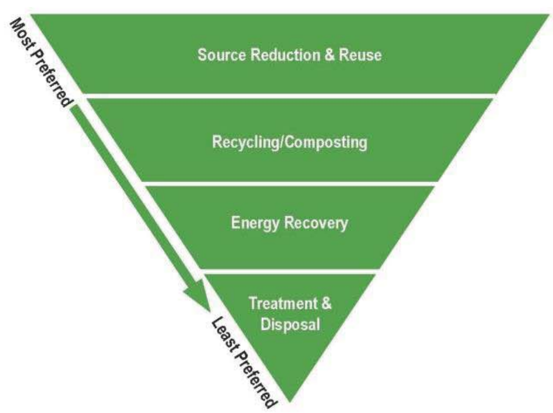


Figure 1

COVANTA
Powering Today. Protecting Tomorrow.

Energy-from-Waste (EfW) is an important part of an overall integrated waste management approach, recognized in the European Union and U.S. EPA waste management hierarchies (Figure 1) as preferable to landfilling for those materials remaining after waste reduction, reuse, and recycling efforts have been exhausted.[ii] With over 500 facilities operating in Europe, EfW plays a critical role in the way materials are managed. For example, countries such as Germany, Austria and the Netherlands have recycling rates of 50 percent to over 65 percent and use EfW for nearly all of what remains.

We help many of our existing commercial and industrial clients meet their zero waste-to-landfill and zero landfill goals by providing them with an energy recovery solution for wastes remaining following source reduction and recycling efforts. We can also provide secure and guaranteed destruction of defective, off-spec, outdated or proprietary materials, while simultaneously recovering energy from those same materials. 3-1 Cont'd

Covanta Stanislaus already plays an integral role in Stanislaus County's comprehensive solid waste management system that includes recycling, composting and waste to energy. In fact, as a complement to Stanislaus County's 60 percent recycling rate (which is higher than most counties in the state), Covanta Stanislaus recovers over 8,500 tons of ferrous and non-ferrous metals each year. These are metals commonly found in mattress springs or broken office chairs that would otherwise be landfilled.

The strategic and beneficial location of the Covanta Stanislaus Energy-from-Waste facility serves as an added advantage for CLIBP in attracting and retaining domestic and international commercial and industrial tenants.

Facility Background

The Stanislaus Resource Recovery Facility began commercial operation in January 1989 and is located in the community of Crows Landing, about 25 miles from Modesto in the farmlands of California's central valley, and less than two miles from CLIBP's Phase 1 development area. Covanta Stanislaus employs 50 people and produces approximately 200,000 pounds of steam at 830 degrees Fahrenheit and at 865 pounds per square inch gauge (psig).

With the redundant two (2) 425 ton per day boilers, Covanta Stanislaus converts over 800 tons per day of post-recycled trash into clean, dependable energy.

As a result of our state-of-the-art air pollution control equipment, which includes Semi-dry flue gas scrubbers injecting lime, fabric filter baghouses, nitrogen oxide control system, mercury control system and continuous emissions monitoring (CEM) system, we perform well below strict permit requirements of the San Joaquin Valley Air Pollution Control District.

Under the facility's Title V permits, the Air District continuously monitors the facility emission to ensure stringent compliance. In addition, the facility is a zero water discharge plant, which means that all wastewater generated on-site is treated and reused in the process.

COVANTA
Powering Today. Protecting Tomorrow.

Waste as an Energy Resource

While waste reduction, reuse and recycling are the best means of preserving natural resources through better management of the waste stream, EfW facilities recover significant energy from the municipal solid waste (MSW) that remains, generating clean, renewable electricity and/or steam for export. Compared to landfilling, EfW facilities are 9 to 14 times as effective at capturing the energy that is contained in MSW remaining after recycling. The World Economic Forum has called EFW a "key technology for a future low carbon energy system."

3-1 Cont'd

Incorporating steam export into the Stanislaus EfW facility would provide for even more efficient utilization of the local waste resource. Combined heat and power (CHP) systems operate more efficiently than electric-only facilities and are widely incorporated into steam distribution systems in Europe, including in Copenhagen, Paris and Amsterdam.

Here in the U.S., Covanta has extensive experience operating industrial steam supply facilities. We deliver clean energy in the form of high pressure, high temperature steam to a variety of industrials in manufacturing, refining and the paper industry, as well as mission-critical operations like the Redstone Arsenal and the downtown Indianapolis steam loop.

Facility	Annual Klbs Sold	Steam Clients	Total Miles of Pipe	Years in Service
Niagara	3,832,634	Goodyear, Greenpac, Niacet, Norampac, Occidental, Praxair	4.5	31
Huntsville	556,311	US Army Redstone Arsenal	31	27
Indianapolis	2,915,436	Citizens Thermal Steam Utility Network	0.5	29
Pittsfield	205,436	Crane Paper	1.5	36
Tulsa	1,481,008	Holly Frontier Refinery	0.5	31
Total	**8,990,825**	**10 Groups**	**38**	**154**

COVANTA
Powering Today. Protecting Tomorrow.

Case Study: Niagara Falls EfW

Creating mutually beneficial and interdependent systems is one of the highest ideals of sustainable waste management—and one that Covanta continues to pursue. A prime example of this is the collaboration we have between our EfW facility in Niagara Falls, New York, and two local paper manufacturers: Greenpac Mill and Diamond Packaging.

Considered the most advanced and largest facility of its kind in North America, Greenpac Mill manufactures lightweight linerboard for corrugated boxes made with 100 percent recycled fibers. It has an annual production capacity of 540,000 short tons.

3-1 Cont'd

Both Greenpac Mill and Diamond Packaging send waste to Covanta Niagara for energy recovery. In this way, we are helping Greenpac Mill (and its parent company, Cascades Inc.) achieve its waste and energy goals, while helping Diamond Packaging maintain its zero-manufacturing waste-to-landfill status. But what makes this a truly circular solution is the fact that Greenpac Mill is powered partly by its own waste. Covanta Niagara does this by creating energy from the rejects and waste from the mill and returning the steam generated during the combustion process back to the mill, which uses it for drying the paper it produces.

A similar symbiosis is possible between Covanta Stanislaus and the businesses and manufacturing operations that could site at the CLIBP.

Greenhouse Gas Mitigation

On average, the U.S. EPA has determined that EfW facilities reduce lifecycle GHG emissions by one ton of CO2 equivalents (CO2e) for every ton of MSW diverted from landfill and processed. As a result of California's stringent landfill regulations and the local California electrical grid, which is significantly less carbon intensive than the national average, and based on its operating and GHG emissions data, Covanta Stanislaus avoids approximately 0.5 – 0.7 tons of CO2e per ton of MSW processed.

By reducing emissions that would have otherwise occurred, EfW is the only major source of energy generation that actually reduces GHG emissions.

A prominent peer reviewed study written by U.S. EPA scientists, aptly named "Is It Better to Burn or Bury?" found GHG emissions from EfW to be significantly less than landfills, concluding, "if the goal is greenhouse gas reduction, then EfW should be considered as an option under U.S. renewable energy policies."

COVANTA
Powering Today. Protecting Tomorrow.

EfW contributes to the reduction of GHGs in the environment in three ways:

1. Generating energy that otherwise would likely be generated by fossil-fueled facilities

2. Diverting solid waste from landfills where it would have emitted methane for decades, even when factoring in landfill gas collection

3. Recovering metals for recycling, thereby saving the GHGs and energy associated with the production of products and materials from virgin inputs

3-1 Cont'd

The GHG benefits of EfW relative to landfilling are well recognized, including by CalRecycle,[iii] CARB,[iv] the Center for American Progress,[v] Third Way,[vi] a 2016 report from the Berkeley Law Center for Law, Energy & the Environment,[vii] U.S. EPA,[viii] U.S. EPA scientists, [ix] the Intergovernmental Panel on Climate Change ("IPCC"), [x] the World Economic Forum, [xi] and the European Union. [xii,xiii]

The recognition given to EfW is in large part a result of its ability to avoid emissions of the potent GHG methane. EfW's climate benefits are even more striking in light of methane's role as a short-lived climate pollutant (SLCP). New data shows that the methane emitted by landfills and other sources is even more damaging than previously thought. Alarmingly, Methane was found to be the second largest contributor to global climate change. [xiv]

The Covanta Stanislaus Energy-from-Waste facility has been serving Stanislaus County for decades and can provide dependable, clean energy for the CLIBP without adding emissions to the local air shed. We urge you to consider its inclusion in this marvelous, forward-thinking project that will create well-paying jobs and serve as an enduring example of responsible, universally-beneficial and highly progressive materials management that will ensure beyond all doubt that no waste is ever wasted at the CLIBP.

Thank you.

Sincerely,

A Thomas DeMaio

A. Thomas DeMaio,
Client Business Manager

Eric Schneider,
Facility Manager

COVANTA
Powering Today. Protecting Tomorrow.

i. U.S. EPA (2009) Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices https://www.epa.gov/sites/production/files/documents/ghg-land-materials-management.pdf

ii. European Union, EU (2008) Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Official Journal of the European Union. L312, 51, 3-30

iii. CalRecycle (2012) CalRecycle Review of Waste-to-Energy and Avoided Landfill Methane Emissions. http://www.calrecycle.ca.gov/Actions/PublicNoticeDetail.aspx?id=735&aiid=689

iv. See Table 5 of California Air Resources Board (2014) Proposed First Update to the Climate Change Scoping Plan: Building on the Framework, Appendix C – Focus Group Working Papers, Municipal Solid Waste Thermal Technologies

v. Center for American Progress (2013) Energy from Waste Can Help Curb Greenhouse Gas Emissions http://www.americanprogress.org/wp-content/uploads/2013/04/EnergyFromWaste-PDF1.pdf

vi. Third Way (2014) Power Book: Energy from Waste, http://powerbook.thirdway.org/filter-web-app/energy-from-waste, accessed November 26, 2014.

vii. Berkeley Law Center for Law, Energy & the Environment (2016) Wasting Opportunities: How to Secure Environmental & Clean Energy Benefits from Municipal Solid Waste Energy Recovery. https://www.law.berkeley.edu/research/clee/research/climate/waste-to-energy/

viii. U.S. EPA Office of Solid Waste, Energy Recovery from the Combustion of Municipal Solid Waste (MSW), https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw#EnergyRecovery, accessed January 20, 2017.

ix. Kaplan, P.O, J. DeCarolis, and S. Thorneloe (2009) Is it better to burn or bury waste for clean electricity generation? Environ. Sci. Technology 43 (6) pp1711-1717. http://pubs.acs.org/doi/abs/10.1021/es802395e

x. Efw identified as a “key mitigation measure” in IPCC, “Climate Change 2007: Synthesis Report. Contribution of Work Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change” [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm

xi. Efw identified as a key technology for a future low carbon energy system in World Economic Forum. Green Investing: Towards a Clean Energy Infrastructure. January 2009. Available at: http://www.weforum.org/pdf/climate/Green.pdf

xii. EU policies promoting Efw as part of an integrated waste management strategy have been an overwhelming success, reducing GHG emissions over 72 million metric tonnes per year, see European Environment Agency, Greenhouse gas emission trends and projections in Europe 2009: Tracking progress towards Kyoto targets http://www.eea.europa.eu/publications/eea_report_2009_9

xiii. European Environmental Agency (2008) Better management of municipal waste will reduce greenhouse gas emissions. Available at: http://www.eea.europa.eu/publications/briefing_2008_1/EN_Briefing_01-2008.pdf

xiv. See Figure SPM.5 of IPCC (2013) Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf

3-1 Cont'd

COVANTA
Powering Today. Protecting Tomorrow.

Response to Comment Letter 3 – Covanta Stanislaus

Response to Comment 3-1

The commenter's support for the project is acknowledged.

This page intentionally left blank

2.3.4 LETTER 4, CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD #2, DATED MARCH 5, 2018

Letter 4

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

RECEIVED
MAR 6 2018
STANISLAUS CO. PLANNING & COMMUNITY DEVELOPMENT DEPT.

28 February 2018

Rachel Wyse
Stanislaus County
Planning and Community Development

CERTIFIED MAIL
91 7199 9991 7035 8419 4485

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, SPECIFIC PLAN, GENERAL PLAN AMENDMENT AND REZONE APPLICATION NO. PLN2013-0091 – CROWS LANDING INDUSTRIAL BUSINESS PARK PROJECT, SCH# 2014102035, STANISLAUS COUNTY 4-1

Pursuant to the State Clearinghouse's 27 January 2018 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environment Impact Report* for the Specific Plan, General Plan Amendment and Rezone Application No. PLN2013-0091 – Crows Landing Industrial Business Park Project, located in Stanislaus County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38. 4-2

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin

Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. 4-2 cont'd

For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/.

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Policy is available on page IV-15.01 at:
http://www.waterboards.ca.gov/centralvalleywater_issues/basin_plans/sacsjr.pdf 4-3

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit 4-4
Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as

stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). 4-4 Cont'd

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process. 4-5

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. 4-6

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. 4-7

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification
If an USACOE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. 4-8

Waste Discharge Requirements – Discharges to Waters of the State
If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. 4-9

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Dewatering Permit
If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver)
R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge. 4-10

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:

4-10 Cont'd

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program. There are two options to comply: 4-11

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/for_growers/apply_coalition_group/index.shtml or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently $1,084 + $6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Low or Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be 4-12
covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require 4-13
coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit.

For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit3.shtml

If you have questions regarding these comments, please contact me

Stephanie Tadlock

Stephanie Tadlock
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Response to Comment Letter 4 – Central Valley Regional Water Quality Control Board

Response to Comment 4-1

See Response to Comment 2-1.

Response to Comment 4-2

See Response to Comment 2-2.

Response to Comment 4-3

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The comment also states that the antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System (NPDES) and land discharge Waste Discharge Requirements (WDRs) permitting processes, and therefore the DEIR should evaluate potential impacts to both surface and groundwater quality.

Detailed information pertaining to existing surface water and groundwater quality is presented in Draft EIR Section 3.10, "Hydrology and Water Quality," on pages 3.10-8 through 3.10-15. The State's Antidegradation Policy is discussed on page 3.10-19. The NPDES permit program requirements are discussed on pages 3.10-16, 3.10-20, and 3.10-21. The project's potential temporary, short-term construction-related drainage and water quality effects are evaluated in Draft EIR Impact 3.10-1 (page 3.10-29). Implementation of Mitigation Measures 3.10-1a (Prepare and Implement a Grading and Erosion Control Plan) and 3.10-1b (Prepare and Implement a Stormwater Pollution Prevention Plan and Associated Best Management Practices) would reduce the potentially significant impact from short-term, temporary, construction-related drainage and water quality impacts to a less-than-significant level because the SWPPP is required by law to specify and implement water quality control measures pursuant to the NPDES *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ as amended by Order No. 2012-0006-DWQ); State Water Resources Control Board's (SWRCB's) *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* (Order No. 2013-0001-DWQ); the *Storm Water Management Program for Stanislaus County* (Stanislaus County 2004) or more recent version if applicable; and the Stanislaus County Stormwater Management and Discharge Control Ordinance (Chapter 14.14 of the County Code) (Draft EIR pages 3.10-29 and 3.10-30).

The project's potential long-term water quality and channel scouring effects from hydromodification are evaluated in Draft EIR Impact 3.10-2 (pages 3.10-30 through 3.10-36). Implementation of Mitigation Measure 3.10-2 (Prepare and Implement a Drainage Plan Demonstrating Compliance with the County's Drainage Plan) would reduce the significant effect associated with increased risk of flooding and hydromodification from increased stormwater runoff to a less-than-significant level, because each tenant/leasehold developer would demonstrate to Stanislaus County that the future project phases would conform with applicable regulations pertaining to surface water runoff, including the measures outlined in the applicable version of the *2015 Post Construction Standards Plan* (Stanislaus County 2015) and the *Stanislaus County Standards and Specifications* (Stanislaus County 2014: Chapter 4), which are designed to meet applicable State and local regulations pertaining to stormwater runoff.

The project's potential long-term water quality effects from continuing agricultural operations in the short-term and from operating urban land uses in the long term are evaluated in Draft EIR Impact 3.10-3. Existing agricultural land uses are already subject to existing ILRP permits, and will continue to be subject to those permits as long as those agricultural land uses continue during the phased build-out of the project. Implementation of Mitigation Measures 3.10-3a (Prepare and Implement Drainage Plan Demonstrating Compliance with the County's Drainage Plan), 3.10-3b (Prepare and Implement a Long-Term Site-Specific Operational Stormwater Quality Management Plan), and 3.10-3c (Implement an Agreement between Project Leaseholders and Stanislaus County to Provide Maintenance, Monitoring, and Funding for Long-Term Operational Stormwater Quality Control) would reduce these impacts to a less-than-significant level because site-specific drainage plans would be prepared that incorporate BMPs and include LID features to treat stormwater runoff, a site-specific stormwater quality management plan for long-term operational treatment of stormwater prior to discharge would be prepared and implemented, and because the developer(s) would enter into an agreement with the County to provide maintenance, monitoring, and funding for long-term implementation of the stormwater quality management plan.

Groundwater quality impacts are also evaluated in Draft EIR Impact 3.9-2 in Section 3.9, "Hazards and Hazardous Materials," as related to the on-site contaminated groundwater plume (pages 3.9-19 through 3.9-22), on-site agricultural chemicals (page 3.9-22), and off-site known hazardous materials sites (pages 3.9-22 and 3.9-23). Implementation of Mitigation Measures 3.9-2a (Prepare and Implement a Worker Health and Safety Plan, and Implement Appropriate Measures to Minimize Potential Exposure to Hazardous Materials), 3.9-2c (Design the Interstate (I-)5/Fink Road Interchange Improvements to Avoid Contact with Landfill Materials), and 3.9-2d (Perform an Environmental Site Assessment of the AL Castle Site, and Implement Remediation if Necessary) would reduce groundwater impacts to a less-than-significant level because work would halt if evidence of contamination is encountered and appropriate remediation would be performed, and no development would occur in the Restricted Area around the contaminated groundwater plume until the remediation goals have been met, as determined by California Department of Toxic Substances Control (DTSC) (Draft EIR pages 3.9-23, 3.9-24, and 3.9-27). See also Response to Comment Patterson-50.

Response to Comment 4-4

See Responses to Comments 2-2 and 2-3.

Response to Comment 4-5

See Response to Comment 2-3.

Response to Comment 4-6

See Response to Comment 2-4.

Response to Comment 4-7

The Clean Water Act (CWA) Section 404 requirements are discussed in Draft EIR Section 3.4, "Biological Resources," on page 3.4-19. The CWA Section 404 requirements have been incorporated into the project's thresholds of significance, as stated on Draft EIR page 3.4-23 ("…have a substantial adverse effect on federally protected waters of the United States, including wetlands, as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means"). Draft EIR Impact 3.4-5 (pages 3.4-33 and 3.4-34) evaluates the potential for loss of federally protected waters of the U.S. through removal (fill) or dredging and alteration. Implementation of Mitigation Measure 3.4-5 (Compensate for Loss of Wetlands and Other Waters) would reduce this impact to a less-than-significant level because the County would obtain a USACE Section 404 Individual Permit and CVRWQCB Section 401 water quality certification before any groundbreaking activity within 50 feet of waters or discharge of fill or dredge material into any water of the U.S. Furthermore, wetland habitat would be restored or replaced at an acreage and location and by methods agreeable to USACE and CVRWQCB, depending on agency jurisdiction, as determined during the Section 401 and Section 404 permitting processes (Draft EIR page 3.4-34).

Response to Comment 4-8

The CWA Section 401 requirements are discussed in Draft EIR Section 3.4, "Biological Resources," on pages 3.4-19 and 3.4-20. CWA Section 401 requirements have also been incorporated into Draft EIR Mitigation Measure 3.4-5 (Compensate for Loss of Wetlands and Other Waters) (page 3.4-34). See also Response to Comment 4-7.

Response to Comment 4-9

The requirements for WDRs are discussed throughout Draft EIR subsection 3.10.2, "Regulatory Framework," in Section 3.10, "Hydrology and Water Quality," on pages 3.10-18 through 3.10-20. For example, on page 3.10-19, "The RWQCB issues WDRs for projects that may discharge wastes to land or water uses to ensure conformance with Basin Plan water quality objectives and implementation policies. WDRs specify terms and conditions that must be followed during the implementation and operation of a project." Draft EIR page 3.20-20 states, "…the Central Valley RWQCB may also issue site-specific WDRs or waivers to WDRs for certain waste discharges to land or waters of the state. In particular, Central Valley RWQCB Resolution R5-2003-0008 identifies activities subject to waivers of reports of waste discharge (RWDs) and/or WDRs, including minor dredging activities and construction dewatering activities that discharge to land."

The County understands that WDRs may be required and would acquire all necessary permits, as required by CVRWQCB.

Response to Comment 4-10

See Response to Comment 4-9.

Response to Comment 4-11

See Response to Comment 2-5.

Response to Comment 4-12

See Responses to Comments 2-2, 4-3, and 4-9.

Response to Comment 4-13

See Responses to Comments 2-2, 4-3, and 4-9.

2.3.5 LETTER 5, CITY OF PATTERSON #1, DATED MARCH 6, 2018

Letter 5

City of Patterson
Office of the City Manager

CITY OF PATTERSON
INCORPORATED 1919

March 6, 2018

VIA EMAIL

Keith Boggs, Assistant Executive Officer
Stanislaus County

Re: Request for Extension of Public Comment Period
Crow's Landing Industrial Business Park Specific Plan, Draft EIR

Dear Keith:

City of Patterson staff has reviewed the Draft EIR for the above-referenced project. There are still some concerns regarding many of the assumptions in the Draft EIR, particularly with regard to the Draft EIR's analysis of the City's sewer and wastewater facilities, and traffic and transportation impacts. We strongly believe, however, that most of the City's concerns can be addressed through the sharing of more information, and by entering into an agreement to ensure that project impacts are adequately addressed. 5-1

As you know, CEQA requires that all substantive comments to the Draft EIR must be submitted prior to the expiration of the comment period. We therefore ask that the County extend the comment period by another 45-60 days, as the City would prefer to resolve our issues regarding this project cooperatively and productively, instead of sending the County a detailed comment letter that publicly exposes the various defects in the EIR's analysis.

5-2

Please contact me at your earliest, to confirm whether the County will extend the Draft EIR comment period for an additional 45-60 days. If notice of this extension is posted by the County by the close of business on **March 9, 2018**, the City will withhold its public comments regarding the project, with the goal of meeting first, to discuss feasible mitigation measures that could go a long way to garnering mutual support between the City and the County, to advance our combined long-term visions for growth on the west side of the County.

Sincerely,

Ken Irwin
City Manager

{CW053686.1}

Response to Comment Letter 5 – City of Patterson #1

Response to Comment 5-1

The County appreciates the commenter's review of the Draft EIR. The commenter does not provide specific comments in this letter related to the Draft EIR's assumptions regarding sewer and wastewater facilities and traffic and transportation. Please see the Responses to Comments for letter #6 (subsection 2.3.6 of this Final EIR).

Response to Comment 5-2

The public review period, as stated in the Notice of Availability/Notice of Completion, was January 22 through March 12, 2018, which is a period of 45 days as required by CEQA. The County then elected to extend the public review period by another 45 days to provide additional opportunity for review and comment on the Draft EIR. The public review period for the Draft EIR subsequently ended on April 26, 2018.

2.3.6 LETTER 6, CITY OF PATTERSON #2, DATED APRIL 26, 2018

Letter 6

Churchwell White LLP

churchwellwhite.com

Barbara A. Brenner

April 26, 2018

VIA US Mail and Email

Stanislaus County Planning and
Community Development Department
c/o Rachel Wyse, Senior Planner

Re: Draft Environmental Impact Report for the Crows Landing Industrial Business Park (SCH# 2014102035)

Dear Ms. Wyse:

Churchwell White serves as City Attorney for the City of Patterson ("City") and submits this comment letter on the City's behalf. The City appreciates the opportunity to provide public comments to the Draft Environmental Impact Report ("Draft EIR") for the Crow's Landing Industrial Business Park Specific Plan ("Specific Plan" or "Project"). The City recognizes the effort by Stanislaus County (the "County") to convert the Crow's Landing Airport into a large employment center. The location of the Project, roughly 1½ miles from City limits, however, naturally raises some concerns regarding the Project's environmental impacts to the City.

The Draft EIR relies on using the City's Water Quality Control Facility ("WQCF") and sewer system to treat Project wastewater flows. In addition, due to the current limits to residential development in unincorporated areas of the County, the Project will require a competitive housing market in Patterson and nearby cities in order to be able to attract large employers. More housing in Patterson will also be needed to meet the goals of the Draft EIR, which assumes that the Project would, overall, reduce transportation trip lengths by commuters in the County. 6-1

Due to these factors, the successful buildout of the Specific Plan requires cooperation between the City and the County. In order to achieve this, the City has asked the County to enter into an agreement that will provide a path forward for financing the City's WQCF expansion, in order to serve the Project. In addition, the City has requested that the County Board of Supervisors endorse the City's vision for growth by entering into a pre-annexation agreement for the Northwest Patterson annexation. This annexation would provide the necessary rooftops in Patterson to make the Crow's Landing Industrial Business Park more attractive to larger employers.

The City's proposed mitigation agreement addressed impacts of the Project related to wastewater treatment capacity, traffic and transportation, and other California Environmental Quality Act ("CEQA")

{CW053769.13}

issues.[1] The pre-annexation provisions would establish a land use balance with the County endorsing the Northwest Patterson annexation in order to support the Project's proposal to add 14,000 jobs in such close proximity to the City. Despite these linkages, the County seems unwilling to consider the City's request for a mitigation and pre-annexation agreement. 6-1 Cont'd

Beyond the Draft EIR's reliance on the City's WQCF without clear mitigation for the impacts that result from that reliance, the Draft EIR also falls short of compliance with CEQA for a variety of reasons. The Draft EIR, among other things, inadequately describes the Project, inadequately analyzes the impacts of the significant increase in groundwater use, wastewater treatment, omits or inadequately specifies feasible mitigation for those impacts, and fails to evaluate a reasonable range of feasible alternatives that would reduce the severity of Project impacts. 6-2

The greenhouse gas and air quality sections of the Draft EIR should be amended to adequately address all sources of greenhouse gas and other emissions resulting from the Project, and to include a valid air impacts study based upon sound methodology and inputs. The Draft EIR must also be revised to mitigate for these emissions through concrete, enforceable, and feasible mitigation measures. 6-3

The analysis included in the Draft EIR fails to use the most recent and applicable data available, resulting in a certain underestimation of the Project's true impacts to wastewater treatment, air quality, traffic, and many other impacts of the Project. The Project description also fails to fully inform the public and the decision makers of the Project's impacts to almost all of the factors that are analyzed as part of the CEQA process. In addition to violating CEQA, the Project is inconsistent with Stanislaus County's own agricultural mitigation policy. 6-4

The flaws in the document require that the Draft EIR be substantially modified and recirculated for review and comment by the public and other public agencies. The City's comments regarding wastewater, transportation and traffic, and land use are provided in the City's capacity as a responsible agency. The remaining comments are provided to convey some of the City's broader concerns regarding the analysis and proposed mitigation measures in the Draft EIR. 6-5

I. Wastewater Collection, Conveyance, and Treatment Facilities

The Project Description provides two options to address wastewater from the Project: (1) connect to the City's WQCF or (2) develop on-site wastewater treatment. The Utilities section, however, identifies on-site wastewater collection and conveyance as an interim measure during Phase 1A of the Project while backbone infrastructure is completed, to convey wastewater to the City's WQCF.[2] 6-6

The Draft EIR provides no analysis of potential impacts related to on-site wastewater treatment. More importantly, this analysis cannot be deferred, especially where the Draft EIR proposes on-site treatment as part of the initial phase of the Project. 6-7

The Draft EIR clearly assumes that the Project will rely on the City's WQCF over the long-term to address the treatment of wastewater flows generated by the Project. As the Draft EIR acknowledges, however, the WQCF currently cannot serve anticipated wastewater flows from the Project.[3] The Project therefore requires the City to expand the WQCF in order to accommodate the Project's wastewater flows. 6-8

[1] Public Resources Code § 21000 et seq.
[2] Draft EIR, Utilities and Service Systems, 3.15-15.
[3] Draft EIR, Utilities and Service System, 3.15-16.

{CW053769.13}

To address this, the Draft EIR requires that all future projects and leasehold development would be required to pay fair-share fees to the City for wastewater treatment.

The Draft EIR proposes Mitigation Measure 3.15-5 to require that, prior to the issuance of any building permit related to the Project, any use that requires wastewater service provide written documentation demonstrating that wastewater treatment capacity is or will be available to support that development. This Mitigation Measure, however, assumes that capacity is the sole criteria. Ultimately, the City must prioritize the buildout of its sewer and wastewater treatment system to primarily serve the needs of City residents. Any additional treatment would require agreement by the City in addition to reservations of capacity. The Draft EIR must therefore be revised to acknowledge that the Project must enter into an agreement with the City in order for sewer service to be provided. As a mitigation measure, however, a generic reference to enter into some agreement in the future cannot be enforced, and clearly would not qualify as feasible mitigation under CEQA.

6-8 Cont'd

CEQA requires the County, as lead agency, to incorporate into the Draft EIR feasible mitigation measures proposed by the City, where such measures would address impacts under the exclusive jurisdiction of the responsible agency. In this case, a mitigation agreement is clearly needed to set forth a feasible financing strategy, as the Draft EIR's proposal to merely pay City sewer impact fees on an ongoing basis will not address the significant, extended planning periods required for the City to implement the necessary phase of WQCF expansion.

In 2016, the City adopted a comprehensive update to its Wastewater Master Plan. Despite this, the Sewer Plan for the Project (Appendix H to the Draft EIR), states that overall system planning assumptions for the Project sewer system were based on *City of Modesto Public Works Department Standard Specifications 2006* (COM Standards) and the *City of Modesto Wastewater Collection System Master Plan, March 2000* (COM Wastewater Master Plan). As a result, the design criteria relies upon studies from 2000 and 2003 and jurisdictions outside of the City, instead of the design criteria from the City's Wastewater Master Plan.[4] The failure to incorporate the Wastewater Master Plan, where the City is a responsible agency, makes the Draft EIR's analysis insufficient under CEQA. As a result, this section of the Draft EIR must be re-evaluated. Failure to rely on the City's Wastewater Master Plan is a fatal flaw of the Project's environmental analysis. 6-9

A Technical Memorandum by Black Water Consulting Engineers, Inc., is attached as **Exhibit A**. As noted by Black Water, the Draft EIR incorporates a series of faulty assumptions that must be corrected, including, but not limited to, the following: 6-10

- Current wastewater flows from the City's existing development and related commitments are significantly greater than previously reported, indicating the anticipated capacity of the WQCF is lower than what was analyzed in the Draft EIR;
- The Draft EIR proposes and assumes that the City will provide sewer capacity for the Project through the ongoing payment of connection fees by the Project; 6-11
- The Draft EIR assumes that the City will address certain deficiencies that are identified in existing sewer infrastructure in order to serve the Project; 6-12

[4] Draft EIR, Utilities and Service Systems, 3.15-16.

{CW053769.13}

- The Draft EIR assumes that the City will be able to time the development of any expansions of the WQCF with development of the Project; 6-13
- The Draft EIR assumes that the City will be able to expand the WQCF beyond its already approved expansion plans; and 6-14
- The Draft EIR does not adequately respond to numerous earlier comments provided to the County as set forth in the August 25, 2017, Technical Memorandum by Black Water, attached as **Exhibit B**. 6-15

To ensure that the EIR's analysis accurately reflects the City's current circumstances and accurately evaluated the future expansion of the WQCF, the Draft EIR should incorporate the design criteria from the City's Wastewater Master Plan. 6-16 Secondly, data included on Tables 3-7 and 3-5 of Appendix H is inconsistent.[5] Those tables should be updated to accurately reflect the data that was provided by Black Water Consulting Engineers, Inc., in its August 25, 2017, Technical Memorandum. 6-17

The Draft EIR also intends to include the Project in the Western Hills Water District ("WHWD"), relying on an existing agreement between WHWD and the City. The existing agreement between the City and WHWD would require significant amendments to address wastewater flows from WHWD, that are much higher than originally anticipated, as well as for flows from the Project. 6-18

Based on the above, the City considers it a reasonable request to enter into a pre-annexation and mitigation agreement with the County, to address the phasing of the expansion of the WQCF and to properly mitigate impacts to the City related to the WQCF. The agreement would coordinate expansion of the WQCF to address both the City and Project's needs for wastewater treatment. Further, the agreement would establish provisions to ensure the timely delivery of wastewater improvements. 6-19

II. Traffic and Transportation

6-20

A peer review of the Draft EIR's Traffic and Transportation section is provided by Stantec, attached hereto as **Exhibit C**. Stantec notes that the Draft EIR uses outdated trip data from 2013 and 2014. 6-21 Since then, numerous projects in the City have been developed, particularly logistic center projects that generate a high number of trips, but also additional gas stations, housing projects, and other developments that contribute to localized traffic within the City and along Sperry Avenue. The Draft EIR must be updated to utilize more recent traffic data and trip counts.

The Draft EIR identifies several City intersections that will have a degraded level of service as a consequence of the Project. Those intersections include: (1) I-5 ramps and Sperry Avenue, (2) Ward Avenue and Sperry Avenue, (3) Ward Avenue and Las Palmas, (4) Sperry Avenue and State Route 33, and (5) Sperry Avenue and Rogers Road. As more fully demonstrated in the study by Stantec, the Draft EIR's analysis of impacts to those intersections and its proposed mitigation measures are not supported by substantial evidence in the record and fail to adequately address the Project's impact. 6-22

An example of the lack of substantial evidence and analysis of impacts to City streets is provided in the Draft EIR's analysis of the level of service on Ward Avenue. The analysis is limited to road segments located within the County, concluding that the expansion of Ward Avenue to four (4) lanes is required. The Draft EIR does not include the segments of the road that are within the City, allowing for that portion of Ward Avenue to remain a two (2) lane local street. This does not address the Project's impact to the 6-23

[5] Draft EIR, Appendix H, pgs. 9-10.

{CW053769.13}

use of Ward Avenue in its entirety, a road that will be used to access the Project both within City limits and in the County areas immediately next to the Project. 6-23 Cont'd

Further, the Draft EIR relies upon the City's existing plans to expand the number of lanes on City roads, including Sperry Avenue. Those plans were made before the Project was proposed and the Project was not considered in the expansion plans. Consequently, it is not clear that the expansion will be sufficient to serve both the City's needs and the Project because no study has been done to determine if the proposed expansion will provide the correct level of service. Therefore, the traffic analysis is flawed. To adequately address the Project's impact, the County must provide its share of funding to address the improvements required to increase the level of service on City road segments that will be utilized to serve the Project, as well as the City's increased maintenance costs for increased traffic on City streets accessing the Project. 6-24

The Draft EIR's only proposed mitigation measure that addresses any impacts to road segments that are located in the City is for the Sperry Avenue and State Route 33 intersection through signalization. However, the Draft EIR specifically reserves that because that intersection is within the City's jurisdiction, the County cannot guarantee that the signalization will occur.[6] The intersection is actually in the California Department of Transportation's ("Caltrans") jurisdiction but abuts the City's jurisdiction. Thus, the City, County, and Caltrans will all be involved in any improvements to this intersection. Once again, substantial evidence in the record does not support the Draft EIR's conclusion and its proposed mitigation measure. 6-25

III. Land Use and Planning and Population, Housing, and Employment

As part of the Project, the County proposes to reinstitute use of the Crow's Landing airport and provide for flights into the Project. In order to allow this use, the City must amend its general plan and zoning to allow airport land uses and comply with the Airport Land Use Compatibility Plan that has been proposed.[7] The Draft EIR provides no analysis of the impacts to the City in this change, instead only noting that both the City and County "are expected to incorporate certain criteria and procedural policies … to ensure that future land use development will be compatible with long-term airport operations."[8] The City has not considered such a change to its General Plan, and zoning and would require additional discussions with the County to address this matter before it can agree to changes that would expose City residents to noise, light, and other impacts from aviation uses. Thus, this impact is not less than significant as it relates to potential impacts to the City and the Draft EIR's conclusion as to the City's impact from the Airport Land Use Compatibility Plan is not supported by substantial evidence. 6-26

The Draft EIR neglects to analyze impacts of the Project to land use and housing by assuming that existing workers in the County are sufficient to meet the demand for construction jobs associated with the Project, and any construction workers employed for the Project that reside outside of the region would be dissuaded from moving to the area because of the temporary nature of the construction work.[9] Consequently, the impact is less than significant and no mitigation is required. However, a thirty (30) year Project with shifting implementation phases is not a temporary project with temporary job prospects for construction workers. There may be lulls in construction phases but based on the Project description, it is more than likely that construction workers from outside the region will elect to move to the area to take advantage of the opportunities associated with building a regional employment center. Therefore, impacts 6-27

[6] Draft EIR, Traffic and Transportation, 3.14-16.
[7] Draft EIR, Land Use and Planning and Population, Housing, and Employment, 3.11-8.
[8] Draft EIR, Land Use and Planning and Population, Housing, and Employment, 3.11-10.
[9] Draft EIR, Land Use and Planning and Population, Housing, and Employment, 3.11-18.

{CW053769.13}

to housing and land use as a consequence of the construction of the Project should be analyzed in the Draft EIR. 6-27 Cont'd

The Draft EIR faintly acknowledges that the development of an employment center (assuming 14,000 jobs) "could, in turn, encourage households to relocate" to the Project vicinity, including areas like the City.[10] Throughout its discussion of potential impacts to the need for additional housing, the Draft EIR concedes the likelihood that increased employment opportunities as a result of the Project will result in additional housing demand, but provides no mitigation for that likelihood, instead asserting that the impact is significant and unavoidable. This pushes off mitigation of this acknowledged environmental impact onto surrounding jurisdictions that provide housing, such as the City.[11] The Draft EIR fails to propose any mitigation measures for the impact, instead only asserting that "[i]mpacts from population and employment growth are analyzed and mitigated, where appropriate, in various sections of the EIR" without specifically identifying that analysis and mitigation, and finding that the impact is significant and unavoidable.[12] This failure to identify and consider mitigation measures is inadequate under CEQA and prohibits the County from making any findings of overriding determinations for this impact. 6-28

To address this impact, the Draft EIR should analyze and include feasible mitigation measures. The City urges the County to consider this request from the City's perspective, as a responsible agency under CEQA and the closest jurisdiction that would experience any population pressures resulting from the Project.

IV. Air Quality

The Draft EIR makes many assumptions in its air quality analysis without any reference to the data supporting those assumptions. Some of those assumptions include: 6-29

- "approximately 60 percent of heavy-duty truck trips for Refrigerated Warehouses and 20 percent of heavy-duty truck trips for General Light Industrial land uses, respectively, would be equipped with [transport refrigeration units]"[13]
- Reduction in commutes is estimated to be reduced by 50 percent for 50 percent of future employees of the Project[14] 6-30
- Odors from the Project will move with implementation of the Project[15] 6-31

The assumptions allow the Draft EIR to find that impacts to air quality are less than significant, or uses the assumptions as part of mitigation measures for impacts to air quality.[16] Without data to support the assumptions with regard to air quality, the mitigation measures that are proposed may not actually provide the mitigation to the impacts that are identified or fail to identify significant impacts that should be mitigated. For instance, assuming that noxious odors will move around the Project area does not mean that individuals will not be exposed to noxious odors from the Project throughout its thirty (30) year 6-32

[10] Draft EIR, Land Use and Planning and Population, Housing, and Employment, 3.11-19.
[11] Cal. Code Regs., tit. 14, §§ 15144, 15126.4, subd. (a)(1)(B).
[12] Draft EIR, Land Use and Planning and Population, Housing and Employment, 3.11-20.
[13] Draft EIR, Air Quality, 3.2-21.
[14] Draft EIR, Air Quality, 3.2-29.
[15] Draft EIR, Air Quality, 3.2-40.
[16] Draft EIR, Air Quality, 3.2-27—41.

{CW053769.13}

implementation schedule. Mitigation measures must be considered and adopted to ensure that consistent noxious odor emissions from the Project are addressed as development of the Project continues. 6-32 Cont'd

Mitigation measures 3.2-1b and 3.2-2b are proposed to "encourage alternatives to the single occupant vehicle commute."[17] Many of the programs included in this mitigation strategy are not enforceable mitigation mechanisms, such as surveys of commuting behaviors for employees at the Project, once built, and flexible working hours to change typical commute hour traffic patterns. These policies may help identify strategies for changing commuting behavior, but there are no required changes to commuting activities to ensure that the projected commute reductions the Project hopes to encourage will be achieved through the proposed mitigation measures. 6-33

The Draft EIR's toxic air contaminant emissions analysis is deemed less than significant because future uses of the Project would employ strategies to avoid exposure of sensitive receptors.[18] However, the Draft EIR makes this assertion without any evidence, substantial or otherwise. There are no citations to policies or regulations that would result in the avoidance of exposure of sensitive receptors. Further, the Draft EIR's analysis fails to take into account the new uses that will be contributing to toxic air contaminant emissions as a consequence of the Project. The Project anticipates an increase in commuter traffic, truck trips, and aviation uses, and will likely result in additional rail trips to serve the industrial uses at the Project. The impact from the increase in aviation uses can be forecast as the existing runway has the potential to be extended an additional 1,000 feet to serve large commercial planes.[19] The knowledge of this potential extension requires that the Draft EIR include reasonable forecast of the impact of this extension. The Draft EIR fails to do so. Consequently, the toxic air contaminant emissions analysis must be revised to address these impacts and to provide enforceable mitigation measures through adopted regulations or policies to address these impacts. 6-34

Finally, Exhibit D to the Draft EIR, evaluating air quality and greenhouse gas emissions, relies on the CalEEMod model from 2013. That model has been updated to Version 2016.3.2. Exhibit D should be updated to ensure that the new projections are not significantly different than those that were made using the 2013 model. Where the impacts based on the modeling changes, the analysis in the Draft EIR should be amended to incorporate the new information. The currently used modeling is now at least five (5) years out-of-date from currently known data related to air quality and greenhouse gas emissions. 6-35

V. Agricultural Impacts

The Draft EIR identifies several policies that both the County and Stanislaus County Local Agency Formation Commission ("LAFCO") have adopted to ensure that any conversion of agricultural land to urban use is mitigated through their entitlement processes. The Draft EIR asserts that there is either no feasible mitigation measure for these types of impacts from this Project or that the impacts to agricultural resources are less than significant.[20] However, both the County's own requirements and LAFCO's policies provide mitigation measures that could address impacts from the Project but are not applied in the Draft EIR. In addition, agricultural mitigation has been recognized as feasible mitigation to address environmental impacts related to the loss of farmland under CEQA. The County, in fact, helped pioneer these obligations under CEQA. 6-36

[17] Draft EIR, Air Quality, 3.2-30, 34.
[18] Draft EIR, Air Quality, 3.2-38.
[19] Draft EIR, Project Description, 2-20.
[20] Draft EIR, Agricultural Resources, 3.3-17-19.

{CW053769.13}

However, because the Project does not involve residential development, the Draft EIR assumes that no mitigation is required for the Project.[21] The County is therefore exempting itself from addressing an impact of the Project that other public agencies, such as the City, will not be exempt from when additional residential development is required to serve the growth that results from the Project. The Draft EIR must be reconsidered in light of the existing requirements under CEQA for farmland mitigation. The County may not identify a significant and unavoidable impact and move on without evaluating all feasible mitigation to substantially lessen the significant environmental effect that has been identified. The Draft EIR improperly avoids mitigation measures that are feasible for the Project's impacts. 6-36 Cont'd

Finally, the Draft EIR identifies the loss of 30.5 acres of agricultural land, 15.8 of which are Williamson Act land, as less than significant. In the analysis of this conversion, the Draft EIR relies on the idea that the Project will not "generate pressure to convert off-site agricultural use" to urban uses.[22] This analysis neglects the impact from the Project of attracting new residents to the County seeking employment opportunities. It is reasonably foreseeable that a project that contemplates creating 14,000 to 15,000 new jobs will attract new residents to the County. This increase in residents will in turn require additional residential uses in the County, which will generate pressure to convert off-site agricultural uses to residential use. Therefore, impacts of the Project on agricultural uses are clearly not less than significant. The County's conclusions are not supported by substantial evidence and are contrary to reasonable future foreseeable impacts of the Project. 6-37

VI. Biological Resources

The Project includes the use of one of the existing runways at the Project site for aviation. There is no consideration of impacts to raptors and other avian species from that use. The site has not been used as an airport in many years. The change in use in the area to include regular aviation is likely to cause changes in migration and the flight path of the avian species in the area. This impact is not considered in the Draft EIR despite the identification of more than twenty (20) special status bird species, including hawk, owl, and vulture species with need for large hunting areas that could be impacted from regular flights landing at and departing from the Project.[23] 6-38

VII. Cultural Resources

The Air Traffic Control Tower ("ATCT") that remains at the Project site from its use as a military post during the Cold War Era has not been examined as a historical landmark since 1998.[24] At that time the ATCT was not yet 50 years old.[25] It has since surpassed that cutoff and has not been evaluated based on new criteria that may apply to an historical site that is more than 50 years old, other than the Draft EIR's perfunctory conclusion that the ATCT "lacks integrity".[26] In order to confirm that the ATCT is not an historical site, the Draft EIR should include a full analysis of the ATCT based on its new status as an over-50 year old building from the Cold War Era. 6-39

VIII. Energy

---

[21] Draft EIR, Agricultural Resources, 3.3-17.
[22] Draft EIR, Agricultural Resources, 3.3-18.
[23] Draft EIR, Biological Resources, 3.4-7.
[24] Draft EIR, Cultural Resources, 3.5-8.
[25] *Ibid.*
[26] Draft EIR, Cultural Resources, 3.5-9.

{CW053769.13}

The Draft EIR concludes that the buildings proposed for the Project will be more energy efficient than existing buildings of similar use in the County. However, the baseline for environmental review is the existing condition in the vicinity of the Project.[27] The baseline used improperly assumes that buildings of similar use in the entire County are the correct existing condition with which to compare to the Project. The area in the vicinity of the Project is currently used as agricultural land. The buildings to be built as part of the Project are likely to have much greater energy consumption than the currently existing surrounding agricultural land uses. Therefore, the energy impacts of the buildings to be built as part of the Project as compared to the existing agricultural uses should be fully analyzed and mitigation measures should be implemented to address that difference. 6-40

Further, the Draft EIR provides a projected annual electrical and natural gas demand of "approximately 318.34 million kWh and approximately 359,152.46 million British thermal units (MMBtu)" for the Project.[28] There is no evidence, substantial or otherwise, supporting this projected demand that is used to compare to other energy demand for similar uses in the County. Therefore, all conclusions based on these figures are not supported by substantial evidence and fail to fulfill the requirements under CEQA. 6-41

Transportation related energy consumption is assumed to decrease in the Draft EIR through reduced commutes of some County residents that are able to cease commuting outside of the County for work as a consequence of the Project. This assumes that County residents will leave their existing jobs to work closer to home. In order to make this assumption, the County must also assume that the Project will provide jobs that provide benefits and opportunities that are comparable to the opportunities that County residents are currently commuting outside of the County to pursue. Moreover, in order for the Draft EIR's presumption to be true, the Project must not encourage individuals from outside the County, in more remote locations of the Central Valley or elsewhere, to commute to the Project to seek out the employment opportunities that are available as a consequence of the Project. In summary, there is no way to know if the Project will reduce transportation related energy consumption and that impact should be analyzed once it is clear what types of jobs are created through the Project. 6-42

IX. Greenhouse Gas Emissions

As discussed above, the Draft EIR makes the same assumption in this section of its analysis as it did for its Energy analysis, that the Project will reduce out-of-County commutes for employment opportunities in the Bay Area and Sacramento regions.[29] This presumption does not consider that the Project will attract individuals from other areas of the Central Valley, or elsewhere, rather than reducing commutes of individuals that already reside in the County. This would increase greenhouse gas emissions rather than reduce them, as County residents would continue to commute to their current vocations in the Bay Area and Sacramento and there would be additional vehicle miles travelled from other areas of the Central Valley for the news jobs provided through the Project. There may be a combination of County residents and non-County residents taking advantage of the Project's new employment opportunities, but the Draft EIR fails to take into account this possibility and analyze the potential for an increase in greenhouse gas emissions from commuting individuals. 6-43

Additionally, the existing baseline condition of the Project area is agricultural use. The Project objective, to create a regional employment center that provides an additional 14,000-15,000 jobs, is a significant 6-44

[27] Cal. Code Regs., tit. 14, § 15125, subd. (a).
[28] Draft EIR, Energy, 3.6-7.
[29] Draft EIR, Greenhouse Gas Emissions, 3.7-22.

{CW053769.13}

change from the existing agricultural use of the Project area. The employment center will result in greater emissions than those that currently exist. More individuals commuting to the Project area, even individuals who already reside in the City, will increase emissions as more people are attracted to the area by the employment opportunities at the Project. The Draft EIR fails to analyze this impact. Consequently, the Draft EIR's analysis of greenhouse gas emissions is insufficient and not supported by substantial evidence. 6-44 Cont'd

Additionally, as discussed in the air quality section, above, Exhibit D to the Draft EIR, evaluating air quality and greenhouse gas emissions, relies on the CalEEMod model from 2013. That model has been updated to Version 2016.3.2. Exhibit D should be updated to ensure that the new projections are not significantly different than those that were made using the 2013 model. Where the impacts based on the modeling change, the analysis in the Draft EIR should be amended to incorporate the new information. The currently used modeling is now at least five (5) years out-of-date from currently known data related to air quality and greenhouse gas emissions. 6-45

X. Geology, Soils, Minerals, and Paleontological Resources

Several site-specific studies have not been prepared or obtained, including: a geotechnical report that meets California Building Code standards, laboratory soil analyses, and a civil engineer's report to reduce potential damage from soil compression, subsidence, settlement, and perched groundwater.[30] The Draft EIR identifies the impact of geologic hazards related to construction in unstable soils, which requires the site-specific studies that have not yet been completed, as potentially significant. However, after identifying the mitigation measures of securing the requisite studies, the Draft EIR determines that the impact is less than significant. Without actually completing the site-specific studies, it is impossible to determine whether the impact is significant or not. Without the studies, there is no way to determine if the Project site is actually suitable for the Project. Thus, the site-specific testing should be conducted to determine if it is even possible to implement the Project at the proposed Project site, and the Draft EIR should be revised accordingly pending the outcome of that testing. 6-46

XI. Hazards and Hazardous Materials

The City is likely to be a main access point to the Project both during construction and once the Project is in operation. However, the Draft EIR dismisses the possibility that the City could be exposed to accidental spills during the routine use and transport of hazardous materials because of "slow speeds due to the number of stop signs and stop lights" in the City.[31] The presumption that the City will not be impacted by accidental spills of hazardous materials during the thirty (30) year implementation period of the Project is incredibly optimistic. Thirty years of the transportation of hazardous materials through the City, especially when continued growth and development of the region is anticipated, is likely to result in ongoing changes to traffic patterns and other complications that could result in an accidental spill or exposure of hazardous materials in the City. The Draft EIR should establish a plan to address any accidental spills or exposures of hazardous materials to high population density areas, such as the City, to ensure that individuals in the area of the Project are not needlessly put at risk because the "slow speeds due to the number of stop signs and stop lights" in the City make it less likely that truck traffic and construction related traffic will not access the Project via the City. 6-47

---

[30] Draft EIR, Geology, Soils, Minerals, and Paleontological Resources, 3.8-13.
[31] Draft EIR, Hazards and Hazardous Materials, 3.9-17.

{CW053769.13}

The Draft EIR identifies an existing contaminated soil and groundwater plume that is associated with the Project site's previous use as a United States military base that included aviation.[32] As a consequence of the plume, on-site pumping is restricted within a 2,000 foot area of the plume.[33] The plume is also alleged to be restricted to the top layer of the aquifer, above the groundwater source for the Project, protected by a layer of Corcoran clay.[34] The impacts to the Project's ability to pump groundwater as a consequence of the plume are not addressed in either the Hazards and Hazardous Materials section or the Hydrology and Water Quality section of the Draft EIR. The Draft EIR notes that the plume has already "migrated off-site to the east and [a contaminant of concern] has been detected in a well that is used to irrigate an almond orchard immediately adjacent to the eastern side of the project site."[35] Despite this, there is no analysis of the potential for additional pumping to continue to result in additional migration of the plume. Therefore, the Project environmental analysis is flawed. 6-48

XII. Hydrology and Water Quality

Historic groundwater production at the Project site for 2012 through 2015 was on average 834 acre-feet per year.[36] The total projected water demand for the Project at full buildout would increase that production to 2,819 acre-feet per year.[37] This is an increase of about 1,985 acre-feet per year and, as the Draft EIR acknowledges, additional drawdown in the confined aquifer beneath the City, the City of Newman, and the Project site would result. The additional pumping at full buildout combined with the City's projected growth and additional water need absorbs all of the total available water supply in the aquifer. This apparent deficiency in water supply must be studied and addressed in full, rather than deemed less than significant through mitigation measures such as installing monitoring wells and complying with requirements under the Sustainable Groundwater Management Act ("SGMA") requirements, once those are put in place.[38] Thus, the Draft EIR's analysis in insufficient. 6-49

The Draft EIR acknowledges that the SGMA that was passed in 2014 will require that the Project address impacts to the groundwater basin from the Project's reliance on groundwater as its sole source of potable water.[39] However, the Draft EIR does not address the possibility that groundwater could become an unavailable option to serve the Project, or could be insufficient to meet the Project's need where the Project's groundwater pumping results in undesirable results. SGMA implementation is in its infancy, but over the course of the Project, SGMA and its ability to regulate groundwater use will be applied. Consequently, the Draft EIR should include a plan to address any future requirements through SGMA that may restrict groundwater pumping - the Project's sole source of potable groundwater. 6-50

The Davis Road Levee improvement is identified in the Draft EIR as a solution to address 100-year flood impacts, but no site-specific design for the levee is provided.[40] Exact height of the levee road, crown width, side slopes, and construction techniques have yet to be determined or established.[41] Each of these elements are necessary to determine the levee improvement's feasibility. Without some idea of the exact 6-51

---

[32] Draft EIR, Hazards and Hazardous Materials, 3.9-18.
[33] Draft EIR, Hazards and Hazardous Materials, 3.9-22.
[34] Draft EIR, Hydrology and Water Quality, 3.10-14.
[35] Draft EIR, Hazards and Hazardous Materials, 3.9-19.
[36] Draft EIR, Hydrology and Water Quality, 3.10-8.
[37] Draft EIR, Hydrology and Water Quality, 3.10-42.
[38] Draft EIR, Hydrology and Water Quality, 3.10-45.
[39] Draft EIR, Hydrology and Water Quality, 3.10-44.
[40] Draft EIR, Hydrology and Water Quality, 3.10-53.
[41] *Id.*

{CW053769.13}

requirements to allow this improvement to move forward and address 100-year flood impacts, the potential impacts after mitigation cannot be less than significant, as is identified in the Draft EIR. 6-51 Cont'd

XIII. Noise and Vibration

The Draft EIR does not make clear whether the Project will comply with the County's existing noise ordinance, noting that "construction and maintenance activities performed under the direction of a public entity or public utility are exempt from the County's noise requirements."[42] Following that discussion, the Draft EIR acknowledges that construction noise for the Project is potentially significant and proposes a mitigation measure to address that impact.[43] The mitigation measure includes restrictions meant to address the impact, but concludes that even with mitigation the impact is significant and unavoidable.[44] The County is the lead agency and the Project proponent at this time. Therefore, during at least the first phase of the Project, the County may allow construction and maintenance activities outside of the requirements in the County noise ordinance. The Draft EIR does not consider the requirements in the County's noise ordinance as a mitigation measure. This is inadequate as the County, as lead agency, must propose all feasible mitigation to substantially lessen a significant environmental effect irrespective of their noise ordinance. 6-52

As part of the Project, the Draft EIR addresses noise impacts from the use of the airport. The airport has not operated in years; the surrounding land uses are accustomed to no air traffic, not an active airport. Therefore, the appropriate baseline is the change from no airport noise to an operating airport. The Draft EIR instead uses a baseline of an accepted level of airport noise from an existing, operating airport. This does not analyze the change in noise impacts that will occur as a consequence of the Project. 6-53

The Draft EIR also acknowledges that an existing noise source is the operation of a railroad mainline that is parallel to State Route 33, located approximately 125 feet from the Project site's northeastern corner.[45] State Route 33 serves as the Project's northeastern site boundary.[46] Despite the Project objective to build an industrial business park, the Draft EIR asserts that use of this rail facility is "not expected to exceed two train trips per day," which is the existing number of trips observed during the monitoring completed on November 10 through 13, 2016.[47] The Draft EIR provides no further analysis of the impact to rail use as a consequence of the Project. Therefore, the Draft EIR's analysis fails to address an impact from the Project. Rail use is likely to increase as a consequence of the Project's use as an industrial business park. Previous proposed projects at the Project site have included additional rail use, and that impact was not properly analyzed in that iteration of the Project's development. The City was successful in its challenge to the previous version of the Project for the same issue. 6-54

Finally, Appendix E, analyzing current noise and vibration impacts in the Project area was completed in November of 2015. Since that time the City has grown and its footprint has expanded. With this expansion, noise has increased and the City's likely exposure to the Project's noise impacts has increased. Consequently, noise impacts for the Project should be reevaluated, and the Draft EIR should be updated to address any changes to its analysis based on the revised data. 6-55

---

[42] Draft EIR, Noise and Vibration, 3.12-21.
[43] Draft EIR, Noise and Vibration, 3.12-34.
[44] Draft EIR, Noise and Vibration, 3.12-37.
[45] Draft EIR, Noise and Vibration, 3.12-7.
[46] Draft EIR, Noise and Vibration, 3.12-7, 10.
[47] Draft EIR, Noise and Vibration, 3.12-10.

{CW053769.13}

XIV. Public Services

The Draft EIR discussion of public services is limited to impacts to fire and police services only.[48] That discussion delays mitigation of impacts to public services from the Project until the County is able to collect development impact fees from site tenants.[49] While the County is developing the Project, until it has site tenants, the surrounding jurisdiction will have to bear the brunt of these costs without any compensation for those services. This has the potential to degrade the level of service for City police and fire service providers. As the nearest jurisdiction to the Project, the City is likely to be called upon to assist at the Project. Additionally, the increased traffic and individuals relying on the City for services is likely to increase traffic accidents and public safety calls in the City. No mitigation for that increase in need for public safety services to the City is provided. 6-56

Failing to address any other impacts to public services in the Draft EIR, such as impacts to schools, parks, and other public facilities as a consequence of the Project is woefully insufficient in analyzing the impacts of the Project to public services. The City is the nearest provider of these types of services and the most likely to be relied upon to provide them to the individuals employed by the Project. There is no consideration, let alone mitigation of these impacts. Instead the City is left to deal with these issues on its own. The County should provide analysis and mitigation measures for the impacts to the City's public facilities as a consequence of the Project. Especially considering the County's clear forecast of the number of jobs to be created through the Project: approximately 14,000 to 15,000, at full build out. That is a significant impact of people seeking public services that is not addressed in the Draft EIR. 6-57

XV. Alternatives Analysis

The Draft EIR provides two (2) alternatives that were considered but rejected from detailed analysis. First, it addresses an off-site alternative and second, it addresses an alternative use of the Project site. These alternatives both provide reasonable alternatives to the Project that should have been evaluated in detail in the Draft EIR. For example, the Project site could be used to develop a general aviation airport. This proposed alternative would allow the County to achieve its Project objectives in honoring the unique contributions of the Project site's history as the Crows Landing Air Facility, providing sustainable-wage jobs, and rehabilitating Runway 12-30. A second feasible alternative that should have been analyzed is the multi-use entertainment center that was suggested during the Notice of Preparation comment period. That alternative builds on current use of the Project site as a training facility for law enforcement and a venue for car shows. The rejection of these alternatives from a detailed analysis is improper because the alternatives are feasible and can achieve the Project's objectives. 6-58

The only alternative analyzed in depth in the Draft EIR is the development of only a portion of the Project area, rather than all of the former military base, as currently planned.[50] In its comparison between this alternative and the proposed Project, the Draft EIR addresses the change in impact to the infrastructure improvements needed for sewer infrastructure to serve the Project, but does not address the difference in demand on the City's WQCF from a reduced Project size.[51] The reduced size of the Project would reduce the amount of wastewater that the Project would generate. The reduction in wastewater to be collected and treated at the City's WQCF would remove some of the expansion required to serve the Project. This change would then reduce additional impacts from the WQCF expansion. Without a full analysis for the 6-59

---

[48] Draft EIR, Public Services, 3.13-1, 2.
[49] Draft EIR, Public Services, 3.13-5, 6.
[50] Draft EIR, Alternatives, 4-6.
[51] Draft EIR, Alternatives, 4-24.

{CW053769.13}

related impacts that are reduced through the reduced size project proposal, it is impossible to determine if the reduced size alternative would be the preferred alternative with the most merit for development. 6-59 Cont'd

By only analyzing one alternative in depth, that alternative becomes the environmentally superior alternative by default.[52] Using the single alternative defeats the purpose of identifying the environmentally superior alternative under CEQA as there are many other potential uses for the Project site that were not analyzed. The Draft EIR must be revised to include an analysis of additional feasible alternatives, such as the development of the site as a general aviation airport or as a multi-use entertainment center, to determine what feasible alternative is actually the environmentally superior alternative. 6-60

XVI. The Project Description

The Project proposes a thirty (30) year buildout. However, the proposed Project components included in the Draft EIR are focused on adoption of the specific plan, initial backbone infrastructure for the Project, activities located within the Project's footprint, and aviation uses.[53] This limits the scope of impacts analyzed by the Draft EIR.[54] Further, an environmental impact report is required to make reasonable forecasts when evaluating environmental impacts.[55]

The Project may still be in an early phase of development, but the Draft EIR can make reasonable forecasts with regard to impacts to the surrounding area from the full build out of a project that is anticipated to provide approximately 14,000 to 15,000 jobs. Large scale trends and impacts from that large of an increase in jobs in the area, including the impacts to housing and the public services the City provides, can and should be reasonably forecast. Throughout the Draft EIR, there is no forecast of impacts to the City given the projected increase in jobs related to the Project. 6-61

Despite this lack of reasonable projection of impacts, the Draft EIR makes clear that the County can make reasonable forecasts of long-term impacts by relying on the data in the Draft EIR to issue well permits for the Project.[56] That permit is a long-term entitlement to allow permittees to drill a new well or expand an existing well to pump groundwater for an indeterminate period. Such long-term, high-level impacts of the Project should be included throughout the Draft EIR as foreseeable impacts, rather than focusing on just the immediate initial activities that are required to begin implementing the Project.

Finally, the Project objectives are improperly defined to tailor the Draft EIR's analysis to the use of the existing facility to an industrial business park.[57] Rather than defining the Project's objective as a broad purpose, such as an effort to increase employment opportunities for local residents, the Draft EIR defines the Project's objectives as the "reuse [of] the former military property to create a regional employment center that would provide its residents and those living in nearby Central Valley community with opportunities to obtain sustainable-wage jobs that do not require long commute distances."[58] This limitation on the Project objective is not supported by any evidence, substantial or otherwise, to indicate 6-62

[52] Draft EIR, Alternatives, 4-23.
[53] Draft EIR, Executive Summary, ES-1—2.
[54] Cal. Code Regs., tit. 14, § 15152.
[55] Cal. Code Regs., tit. 14, § 15144.
[56] Draft EIR, Project Description, 2-25.
[57] Draft EIR, Project Description, 2-4.
[58] Draft EIR, Project Description, 2-4.

{CW053769.13}

that there is no other feasible use for the Project site. The limitation of the Project objective improperly restricts the entire environmental analysis, including the range of alternatives. 6-62 Cont'd

In establishing this limited scope of the Project objective, the Draft EIR's analysis and potential alternatives are limited to only those uses that would result in an industrial business complex, rather than allowing for the analysis of a range of alternatives. Other potential alternatives include the use of the area as a multi-activity entertainment center including vehicle racing, as suggested in one of the comment letters to the Draft EIR Notice of Preparation.[59] The Project objectives improperly reverse engineer the analysis required under CEQA to conclude that use of the Project site as an industrial business park is the Project site's only reasonable alternative. This improperly narrow Project objective gives the County veto power over every mitigation measure and alternative proposed. 6-63

XVII. Cumulative Impacts

In general, the Draft EIR's cumulative impact discussion avoids the same issue that many other portions of the Draft EIR avoid: the reasonably likely impact of increased demand for residential uses, especially in the City. The cumulative impact analysis fails to include the City's General Plan projections for full buildout of the area within the current City limits. With the development of the Project, this buildout projection is even more likely to occur. Consequently, many other cumulatively considerable impacts are likely to result from the Project, including, among many other, impacts to (1) land use, population, and housing, (2) recreational facilities, (3) public services, (4) water demand, (5) transportation, and (6) growth inducing impacts. As a regional employment center, the Project is likely to have cumulatively considerable impacts at a regional level. Using the Draft EIR as a vehicle from which to tier other subsequent project level analyses requires that this document evaluate the cumulative impacts of an employment center employing between 14,000 and 15,000 people. The Draft EIR fails to do so. 6-64

As an example of a cumulative impact that requires additional analysis, the Draft EIR identifies the water supply for the Project as "relatively stable" based on data from 1996 through 2006, and then relies upon hydrographs from 2011 to present to determine that water supply has not changed significantly in the recent past.[60] However, the Draft EIR then acknowledges that increasing urbanization of the Project area and the Project's own change of water use makes it impossible to tell whether the continued use of groundwater and the reduction in recharge will result in an unsustainable groundwater use for the Project. This significant cumulative impact is one that the County will need to address to ensure that it can implement the Project. Further, there may be significant mitigation requirements under the forthcoming San Joaquin Valley Delta-Mendota Groundwater Sustainability Plan required under SGMA. 6-65

In considering the growth inducing impacts of the Project, CEQA "requires the examination of the direct and indirect impacts of the proposed project."[61] The County asserts that inducing growth is not its intention in proposing the project.[62] However, implementing a Project that provides approximately 14,000 to 15,000 jobs, is more than likely to induce growth regardless of the County's intent. Therefore, the Draft EIR should analyze impacts from that growth and provide mitigation where necessary, rather than provide an acknowledgement of the potential and then avoid any analysis of that likelihood. Additionally, the construction of a thirty (30) year buildout Project is likely to induce unplanned growth in the County, 6-66

---

[59] Draft EIR, Appendix A, Ron West Comment (Nov. 13, 2014).
[60] Draft EIR, Other CEQA Considerations, 5-37.
[61] Draft EIR, Other CEQA Considerations, 5-42.
[62] Draft EIR, Other CEQA Considerations, 5-43.

{CW053769.13}

independent of the Project's purpose as a regional employment center, contrary to what the Draft EIR asserts.[63] 6-66 Cont'd

Once again, the City thanks the County for the opportunity to comment on the Draft EIR. The City looks forward to the County's responses to these comments and future discussions related to the impacts of the Project on the City. If you have any questions or comments with regard to the City's comments to the Project Draft EIR, please contact me

Best regards,

Churchwell White LLP

Barbara A. Brenner
KAF/th

Enclosures
cc: Ken Irwin, City Manager (via email, w/encls.)
Douglas L. White, Deputy City Attorney (via email, w/encls.)

---

[63] *Ibid.*

{CW053769.13}

EXHIBIT A

Technical Memorandum

BLACKWATER CONSULTING ENGINEERS, INC.

To: Robin Baral
Churchwell White, LLP

From: Jeff Black, P.E.

Subject: Public Review Draft – Crows Landing Industrial Business Park Specific Plan EIR, January 2018

Date: March 9, 2018

Black Water Consulting Engineers, Inc. (Black Water) has reviewed the subject Draft Environmental Impact Report (DEIR) with regards to the public utilities and service systems, specifically wastewater generation, collection, conveyance and treatment. The following comments from our review are provided. 6-67

Minor Clarifications

1. Include mention of the City of Patterson (COP) collection system deficiencies to be corrected prior to connecting to the City's system. The deficiencies are stated in Appendix H of the DEIR, but should be discussed in Section 2.6 Infrastructure Improvements of the DEIR.

2. Crows Landing Industrial Business Park (CLIBP) Phase 2 wastewater will need a permanent discharge to the South Patterson Trunk Sewer (SPTS) which has long term capacity for the project wastewater flows. 6-68

3. Appendix H, Table 6-2: Phase 1A lift station capacity is identified as 0.32 mgd. Table 4-5 of the DEIR states the capacity of this lift station is 0.065 mgd. Based on a review of the Phase 1A wastewater flow projections, it appears that Appendix H is correct. 6-69

4. Page 3.15-3, first sentence below Table 3.15-2. The City has not acquired land to expand the Water Quality Control Facility (WQCF) capacity. Sufficient land is available to treat and dispose of the planned future phased improvements to the WQCF identified by the Wastewater Master Plan. 6-70

Inaccuracies or Corrections

5. Appendix H, Section 6: Project Phasing Assumptions (p. 19). The following assumptions are questioned and need to be verified and/or clarified: 6-71
   - *Diablo Grande will generate approximately 1 MGD of sewage flow at buildout. There are currently reports of little to no peaking flow in the trunk. It is uncertain if this lack of peaking flow will continue.*
   - *The County will fund its fair share of the improvements needed in the COP sewer system due to impacts by the CLIBP through connection fees.* 6-72
   - *The COP will build the improvements needed to accommodate the CLIBP.* 6-73

1

I:\J16125 City of Patterson\Tasks\125-17B CLIBP Evaluation\Docs\125_17B DEIR Comments.docx

- *The COP will fix the known existing deficiency in the Ward trunk. The existing deficiency is at the intersection of Ward Ave and M Street. There is a pipe with reverse slope here that will need to be corrected.* 6-74

6. Clarify that the COP WQCF does not have capacity (current or planned) for projected CLIBP wastewater flows. The CLIBP will require the timing of planned WQCF expansions be accelerated and increased, or an addition expansion after Phase V as noted in the Black Water TM dated August 25, 2017. 6-75

7. Page 3.15-3, Table 3.15-2. The wastewater flows generated by the Diablo Grande community are significantly greater than previously reported. Actual flows recorded by the Western Hills Water District (WHWD) flow meter indicate flows ranging between 0.35 and 0.42 mgd are occurring in the WHWD Ward Avenue sewer trunk. 6-76

8. Appendix H, Section 3: Design Criteria used for projecting wastewater flows and loads are provided in Appendix H of the DEIR. It is stated that they are based on data from the City of Modesto 2000 Wastewater Collection System Master Plan and Metcalf & Eddy, 2003. These sources are not consistent with the wastewater flow and loading criterial used by the COP facilities. The DEIR should use applicable design criteria from the 2017 City of Patterson Wastewater Master Plan for the development of wastewater flow and loading projections that will impact COP facilities. 6-77

9. Appendix H, Table 3-7: ADWF data shown in this table are taken from the Technical Memorandum prepared by Black Water Consulting dated August 25, 2017. The data is inconsistent with the values shown in Table 3-5 of Appendix H. 6-78

10. Appendix H, Section 7.1.2: The following statement requires clarification, *"Completion of the Phase III and Phase IV expansion projects described in the City's latest WWMP are needed to accept the full buildout flows from the CLIBP."*
This statement is inaccurate. The acceptance of CLIBP flows will trigger an acceleration of planned phased improvements at the WQCF and require an additional expansion project after Phase V, as stated in the Black Water TM dated August 25, 2017. 6-79

11. The final bullet point of Appendix H Section 8.0 Overall Findings, states that *"Phased on-site community wastewater treatment and disposal facilities that discharge highly treated effluent to landscape irrigation and/or percolation are a feasible alternative to sending wastewater to the City of Patterson."* Has the State Water Resources Control Board been consulted with regards to this option? Prior to issuing a new discharge permit important factors to consider, besides percolation rates and effluent quality, include but are not limited to the potential for consolidation, planning and design, preparation of a Report of Waste Discharge, CEQA, and issuance of waste discharge requirement by the RWQCB. Operations of an on-site system will require the licensed plant operator and on-going sampling and reporting requirements of the permit. The timeline for completing the planning, construction, and permitting of such a facility may not coincide with the project proponent's development schedule. 6-80

Editorial Comments 6-81

a. Page 2-23, last sentence of the continued paragraph at the top of the page contains the duplicate phrase, *"and other relevant standards"*.
b. Page 3.15-1, last sentence of the last paragraph immediately preceding Table 3.15-1 contains a duplicate word, "*that*". 6-82
c. Page 3.15-2, last paragraph. Delete the word transmission from the sentence, "The WQCF provides wastewater ~~transmission~~, treatment, and disposal for both the City of Patterson and the community of Diablo Grande". 6-83
d. References to *Blackwater* Consulting Engineers should be "Black Water", two words. 6-84

Black Water Consulting appreciates the opportunity to provide these review comments and looks forward to continuing to assist with the progression of this project. If you have any questions or wish to discuss any of the comments, please contact me

EXHIBIT B

Technical Memorandum

BLACKWATER CONSULTING ENGINEERS, INC.

To: Ken Irwin, City Manager; Michael H. Willett, Director of Public Works
From: Alison Furuya, P.E.; Jeff Black, P.E.

Subject: Potential Impacts to Patterson Wastewater Facilities from Crows Landing Industrial Business Park

Date: August 25, 2017

INTRODUCTION

Stanislaus County (County) is proposing to reuse the former Crows Landing Air Facility property and develop the Crows Landing Industrial Business Park (CLIBP). The CLIBP is a planned 1,528 acre business park consisting of public facilities, logistics, industrial, business park, and general aviation land uses. The County is seeking permission to convey the wastewater from the CLIBP to City of Patterson (City) facilities for conveyance, treatment and disposal. This technical memorandum (TM) evaluates the potential impacts of the CLIBP project to the City wastewater collection system and Water Quality Control Facility (WQCF). The evaluation included: 6-85

1. A review of the City's Wastewater Master Plan WWMP) [1] and other recently completed documents related to the City's wastewater facilities.

2. A review of the Wastewater Flow and Load assumptions for the future Crows Landing Industrial Business Park development phases memorandum (CLIBP Wastewater Memo) [2], as well as previous documents relating to wastewater infrastructure for the CLIBP.

BACKGROUND

Crows Landing Industrial Business Park Project 6-86

The following is a brief summary of the wastewater information provided in the CLIBP Wastewater Memo. Wastewater flow and loading projections for the CLIBP were developed using the assumptions presented in Table 1.

Table 1 – CLIBP Wastewater Flow and Loading Assumptions

Parameter	Value
Airport Users - Dry Weather Loading Factor	4 gpc/day
General Land Users - Dry Weather Loading Factor	1,000 gpd/acre
Wet Weather Loading Factor, Infiltration/Inflow (I/I)	100 gpd/acre
Dry Weather Peaking Factor	3
Raw Wastewater Constituents	
Biochemical Oxygen Demand (BOD_5)	300 mg/L
Total Suspended Solids (TSS)	300 mg/L
Total Kjeldahl Nitrogen (TKN)	50 mg/L

6-86 Cont'd

The CLIBP plan area infrastructure and land use development is anticipated to occur over three ten-year phases. Table 2 summarizes the projected flows and loads associated with each phase and buildout of the CLIBP.

Table 2 – CLIBP Wastewater Flow and Load Projections

Parameter	Units	Phase 1 2018-2028	Phase 2 2029-2039	Phase 3 2049-2050	Total (Buildout)
Flow					
Average Dry Weather Flow (ADWF)	mgd	0.394	0.223	0.274	0.891
Peak Dry Weather Flow (PDWF)	mgd	1.182	0.669	0.822	2.673
Peak Wet Weather Flow (PWWF)	mgd	1.259	0.691	0.849	2.799
Loads					
Average BOD_5 Load	lbs/day	986	558	686	2,229
Peak BOD_5 Load	lbs/day	1,282	725	891	2,898
Average TSS Load	lbs/day	986	558	686	2,229
Peak TSS Load	lbs/day	1,282	725	891	2,898
Average TKN Load	lbs/day	164	93	114	372
Peak TKN Load	lbs/day	214	121	149	484

City of Patterson Historical Wastewater Flows and Loads

Wastewater flow and influent data for the past five years were reviewed and are summarized in Tables 3 and 4. Several influent BOD and TSS results were unusually high in 2015 and 2016. These results are not included in the data summarized in Table 5.

Table 3 – WQCF Average Dry Weather Flow Summary

	WQCF Influent Flow (mgd)				
Month	**2012**	**2013**	**2014**	**2015**	**2016**
June	1.55	1.41	1.45	1.42	1.41
July	1.38	1.41	1.48	1.49	1.39
August	1.43	1.45	1.48	1.41	1.43
Average	**1.45**	**1.42**	**1.47**	**1.44**	**1.41**
5-yr Average = 1.44 mgd					

Table 4 – WQCF Influent BOD and TSS Summary

Parameter	Units	2012	2013	2014	2015	2016	Average
BOD_5							
Average	mg/L	280	259	287	366	245	**287**
Minimum	mg/L	180	140	120	160	120	**144**
Maximum	mg/L	660	520	710	900	970	**752**
BOD_5 Load							
Average	lbs/d	3,331	3,121	3,500	4,315	2,876	**3,429**
Minimum	lbs/d	2,106	1,708	1,477	1,829	1,380	**1,700**
Maximum	lbs/d	7,211	6,462	8,379	9,833	10,792	**8,535**
TSS							
Average	mg/L	225	235	295	319	208	**256**
Minimum	mg/L	20	44	110	44	72	**58**
Maximum	mg/L	810	610	1,000	820	720	**792**
TSS Load							
Average	lbs/d	2,662	2,834	3,577	3,781	2,436	**3,058**
Minimum	lbs/d	228	522	1,336	540	862	**698**
Maximum	lbs/d	8,850	7,336	11,819	9,708	8,010	**9,145**

6-86 Cont'd

<u>City of Patterson Projected Growth</u>

For this evaluation, wastewater flow was estimated to increase at the same rate as projected population growth rates. The City 2015-2023 Housing Element Updated, adopted February 2016 [3] presented population projections and average annual growth rates for the City and Stanislaus County. These population projections are summarized in Table 5.

Table 5 – Patterson and Stanislaus County Population Projections

Year	Patterson Population	Patterson Average Annual Growth Rate	Stanislaus County Population	Stanislaus County Average Annual Growth Rate
2010	20,413		514,453	
2015	25,065	4.20%	551,668	1.40%
2020	30,375	3.90%	594,146	1.50%
2025	35,685	3.30%	636,625	1.40%
2030	40,995	2.80%	679,403	1.30%
2035	43,559	1.20%	721,582	1.20%
2040	46,124	1.20%	764,060	1.20%
Change/Average	25,711	2.8%	249,607	1.3%

Source: City of Patterson 2015-2023 Housing Element Updated, adopted February 2, 2016 [3]

Projected wastewater flows for the WQCF based on the growth rates presented in Table 5 for the City, with the addition of contributions from Diablo Grande and the CLIBP, are summarized in Table 6. A total ADWF of 1.47 mgd, the maximum ADWF measured for the past 5 years, was used as the starting condition. Average annual growth rates from year 2040-2050 were assumed to be consistent with the growth rate of 1.2% for 2036-2040. The projected buildout flow for the City is also included in the table, and is from the WWMP.

Table 6 – WQCF ADWF Flow Projections

Year/Condition	Average Annual Growth Rate [a]	Projected City ADWF (mgd)	Projected Diablo Grande ADWF (mgd)	Projected Total ADWF w/o CLIBP (mgd)	Projected CLIBP ADWF (mgd)	Projected Total ADWF with CLIBP (mgd)
Existing (2016)		1.40	0.04	1.44	-	1.44
2018	3.9%	1.51	0.05	1.56	0.39	1.96
2029	2.8 - 3.3%	2.15	0.11	2.25	0.62	2.87
2040	1.2 - 2.8%	2.49	0.16	2.65	0.89	3.54
2050	1.2%	2.80	0.22	3.02	0.89	3.91
Buildout	-	5.54	0.75	6.29	0.89	7.18

[a] Average annual growth rate assumptions are based on the average annual growth rates for Patterson presented in Table 6.
[b] Assumes an ADWF of 0.032 mgd for Diablo Grande in 2009-2010, with annual increases of 5,250 gpd per year.

The City receives wastewater from the Diablo Grande development, located west of the City limits. The WWMP reported an ADWF for Diablo Grande of 0.032 mgd, based on flow data from 2009-2010. This flow was used as a baseline and was increased by 5,250 gpd per year, based on the assumption that 30 housing units have been and will be added per year, with an average flow of 175 gallons per day (gpd) per unit. This growth assumption for Diablo Grande resulted in an estimated ADWF of 0.04 mgd for

6-86
Cont'd

Diablo Grande in 2016. The City is in the process of collecting flow data for Diablo Grande. The most recently collected data indicates that Diablo Grande is discharging average flows in the range of 350,000 to 420,000 gpd, which is significantly higher than the estimate shown in Table 6. 6-86 Cont'd

POTENTIAL IMPACTS TO COLLECTION SYSTEM

The CLIBP Wastewater Memo describes the installation of a temporary connection to the existing Western Hills Water District (WHWD) 18-inch sewer trunk line at the intersection of Ward Avenue and Marshall Road to convey CLIBP Phase 1 flows to the City collection system. This temporary connection will be replaced with a permanent connection to the proposed South Patterson Trunk Sewer (SPTS) at the intersection of Bartch Avenue and Ward Avenue, as part of CLIBP Phase 2.

The hydraulic model, developed as part of the WWMP, was evaluated for the existing trunk sewers on Ward Avenue, M Street and Ward Avenue (referred to as the Central Trunk Sewer (CTS) in this TM), and the proposed SPTS. The following two scenarios were executed to determine if the proposed CLIBP wastewater connections could be accommodated by the existing and proposed City collection system.

Scenario 1: CLIBP Phase 1 flows added to southern end of Ward Avenue Trunk Sewer. Diablo Grande ADWF of 0.10 mgd. Complete development of known potential developments in the City, as shown in Figure 1. The developments include: Villages of Patterson, Patterson Gardens, Keystone Business Park, West Ridge Business Park, Villa del Lago, Arambel Business Park, and other small developments. 6-87

Scenario 2: CLIBP Buildout flows added to the proposed SPTS. Diablo Grande buildout flows added to the proposed SPTS. Complete development of City General Plan areas.

The City wastewater loads assigned to the manholes were calculated using the method presented in the WWMP, which includes the use of a variable diurnal peaking factor (DPF) to calculate PDWF and an I/I factor based on area served to calculate PWWF. Consistent with the WWMP, Diablo Grande flows were assigned a constant peaking factor of 3.1 and an I/I factor of 300 gpd/ac over an area of 5,070 acres.

Detailed information regarding the hydraulic model, including a listing of the manhole IDs, wastewater loads, and capacity in the trunk sewers on Ward Avenue, Walnut Avenue, M Street, and the SPTS is provided in Appendix A. An overview of the hydraulic model results is provided below.

- As detailed in the WWMP, the hydraulic limitations of pipe segment E5-6:E5:5 on M Street due to a reverse slope were confirmed, and this pipe segment is recommended for replacement.
- The Ward Avenue trunk sewer does not have sufficient capacity to accommodate the known areas in Patterson for potential growth, shown in Figure 1, and the addition of CLIBP Phase 1 flows. To accommodate the CLIBP flows, the existing 21-inch sections would need to be upsized to 24-inches.
- PWWF from Diablo Grande and potential developments in the City are critical to determining the remaining available capacity in the Ward Avenue Trunk Sewer for the CLIBP.
- The SPTS, as proposed in the WWMP, has sufficient capacity to accommodate the projected CLIBP buildout flows. Projected d/D values in the SPTS range from 0.42-0.60.

POTENTIAL IMPACTS TO WASTEWATER QUALITY CONTROL FACILITY

The existing reliable capacity and projected capacity following the completion of future expansion phases for the WQCF are summarized in Table 8. This information originated from the WWMP, with slight adjustments to provide more detail on capacity impacts associated with decommissioning existing facilities as they become antiquated. Additionally, the existing reliable capacity for the WQCF differs from the permitted capacity. The WQCF is currently regulated under Regional Water Quality Control Board (Regional Board) Waste Discharge Requirements Order R5-2007-0147 (WDRs). The WDRs include effluent nitrogen limits which have been challenging for the older treatment facilities at the WQCF to meet. Therefore, the City considers the reliable capacity of the WQCF to be less than the permitted capacity to ensure compliance with the WDRs. Based on the information presented in Table 7, the addition of the CLIBP flows would require and additional expansion project after Phase V. 6-88

Table 7 – WQCF Existing and Anticipated Capacity

Condition	Reliable Capacity (mgd)	Total Reliable Capacity (mgd)
Existing		1.85
North Activated Sludge Treatment System	0.6	
Advanced Integrated Pond System	0	
South Activated Sludge Treatment System		
Treatment Train 1	1.25	
Completion of Phase III Expansion		3.1
North Activated Sludge Treatment System	0.6	
Advanced Integrated Pond System	0	
South Activated Sludge Treatment System		
Treatment Train 1	1.25	
Treatment Train 2	1.25	
Phase IV Expansion		4.25
North Activated Sludge Treatment System	0	
Advanced Integrated Pond System	0	
South Activated Sludge Treatment System		
Treatment Train 1	1.25	
Treatment Train 2	1.25	
Treatment Train 3	1.75	
Phase V Expansion		6.5
North Activated Sludge Treatment System	0	
Advanced Integrated Pond System	0	
South Activated Sludge Treatment System		
Treatment Train 1	1.25	
Treatment Train 2	1.25	
Treatment Train 3	2	
Treatment Train 4	2	

6-88 Cont'd

Expansion phases are recommended to begin design and permitting seven years prior to reaching the reliable capacity of the facility and construction five years prior to reaching the reliable capacity of the facility. Table 8 presents estimates for the recommended construction completion time for Phase III and IV expansions. The flows to the WQCF are projected to exceed the existing reliable capacity of 1.85 mgd ADWF within the next five years and acceptance of wastewater from the CLIBP is not recommended until construction of Phase III has started. WQCF flows and development projections should be regularly updated to refine the timing for implementation of expansion projects.

Table 8 – Estimated Timing for WQCF Expansion Projects

Expansion Phase	Total Reliable Capacity after Expansion Phase Completed (mgd)	Recommended Year to Complete Construction	
		w/out CLIBP	w/ CLIBP
Existing	1.85	-	-
Phase III	3.1	2018	2017
Phase IV	4.25	2045	2028

Projected BOD, TSS, and TKN strength for the CLIBP are similar to historical WQCF influent concentrations and are not anticipated to be an issue. 6-88 Cont'd

DEVELOPER IMPACT FEES AND COST SHARING

Collection System

The WWMP provided cost estimates for construction of the SPTS. These costs are summarized in Table 9. Table 10 provides a summary of the wastewater loads which the SPTS is planned to accept.

Table 9 – Costs for South Patterson Trunk Sewer Components

Project Components	Base Cost
Junction Structure[a]	495,000
South Patterson Trunk Sewer	3,897,000
South Patterson Pump Station	640,000
South Patterson Force Main	635,000
Base Construction Cost	5,700,000
Probable Construction Cost [b]	8,379,000

[a] Base cost listed is half of the total cost because the junction structure will be for the North Patterson Trunk Sewer as well.

[b] Probable construction cost includes applying contingencies for planning and design (10%), construction management (10%), and construction (20%), to the Base Construction Cost to obtain a subtotal cost. An additional 5% contingency for program administration is applied to the subtotal cost to obtain the Probable Construction Cost. 6-89

Table 10 – South Patterson Trunk Sewer Design Wastewater Loads

Development Area	ADWF (gpd)
Diablo Grande	750,000
Crows Landing Industrial Business Park	891,000
Development in south Patterson	823,060
Projected ADWF Capacity Increase	2,464,060

Based on this information, incremental capacity is being provided at an approximate cost of \$3.40/gpd ADWF. This unit cost can be used as an initial guide for developing impact fees for the collection system.

Wastewater Quality Control Facility

A conceptual list of components for the Phase IV expansion project is provided in Table 11. Budgetary costs are included with the list. The costs provided are based on cost estimates for the Phase III expansion project. The cost estimate indicates that expansion of treatment and disposal capacity is approximately \$30/gpd ADWF.

Table 11 – Budgetary Phase IV Expansion Project Costs

Project Components	**Probable Construction Cost (in \$1,000,000)**
Influent Pump Station	5.00
South Activated Sludge Treatment System, Unit 3	6.00
Solids Handling Facilities	5.50
Effluent Pumping Facilities	2.50
Plant Water System Improvements	0.50
Stormwater/Site Drainage Improvements	1.00
Electrical and Controls	4.00
Demolition of NASTS facilities	1.00
Site Piping	1.00
Site Grading and Surfacing Improvements	1.00
Tertiary Filters	3.00
Disinfection Facilities	2.00
Odor Control	1.00
Percolation Pond Expansion	2.00
Base Construction Cost	35.50
10% Planning and design contingency	*3.55*
10% Construction management contingency	*3.55*
20% Construction contingency	*7.10*
Subtotal	49.70
5% Program Administration contingency	2.49
Total Project Cost	52.19
WQCF Capacity Increase	1.75 mgd
Cost per gallon capacity	\$30

[a] Percolation Pond Expansion cost includes land acquisition.

CLIBP Wastewater Cost Share Estimate

Table 12 presents an estimated cost share for the CLIBP for expanding the wastewater collection and WQCF facilities to accommodate the projected flows from the project. The total estimated CLIBP cost

6-89
Cont'd

share is $29.8 million. The cost share does not include improvements to the existing City wastewater facilities that may be needed to accommodate CLIBP flows on a temporary basis. 6-89 Cont'd

Table 12 – Estimated CLIBP Cost Share for Expanding City Wastewater Facilities

Description	Value
Collection System Expansion Unit Cost	$3.40/gpd ADWF
WQCF Phase IV Expansion Project Unit Cost	$30/gpd ADWF
CLIBP Buildout ADWF	0.891 mgd
CLIBP Buildout Cost Share	$29.8M

SUMMARY

The findings from this evaluation are summarized below.

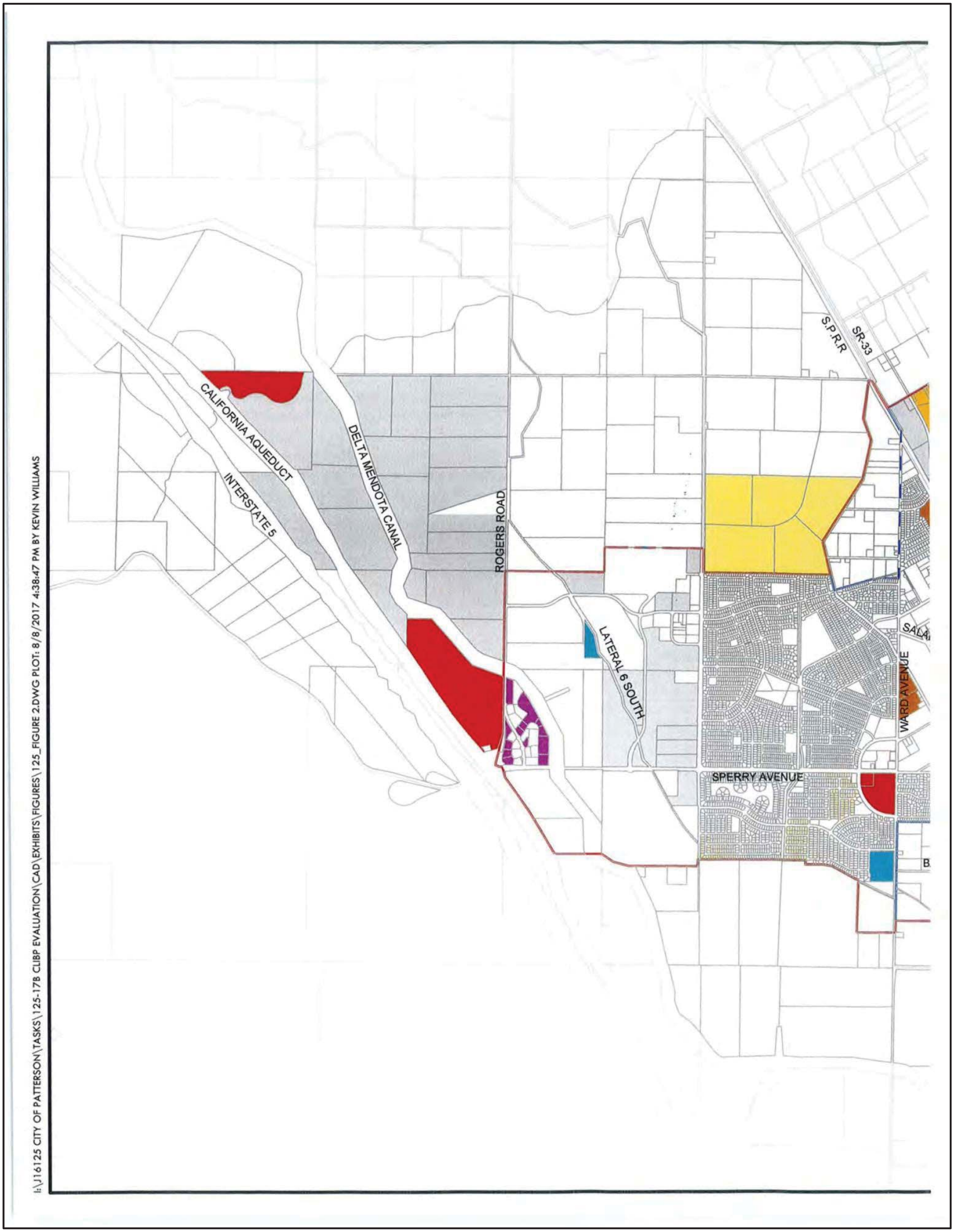
1. The existing collection system does not have sufficient capacity to accept the CLIBP Phase 1 flows and known potential developments in the City.
2. Recommended improvements to the collection system can be implemented to increase capacity in the existing system to accept CLIBP Phase 1 flows. These improvements include:
    a. Replacement of pipe segment E5-6:E5:5 on M Street, as previously identified in the WWMP.
    b. Upsizing of approximately 1,300 feet of 21-inch pipe in Ward Avenue. 6-90
3. The WQCF Phase III Expansion Project should be completed prior to accepting flow from the CLIBP. Accepting the CLIBP flows would be dependent on priority developments within the City.
4. The WQCF Phase IV Expansion Project should be planned for completion in the year 2028, if CLIBP wastewater is treated by the City.
5. The estimated CLIBP cost share for expanding the City wastewater facilities is $29.8 million.
6. The estimates presented in this TM are based on growth and flow assumptions. These assumptions should be reviewed regularly.

REFERENCES

[1] City of Patterson Wastewater Master Plan, prepared by Black Water Consulting Engineers, Inc. and NV5, April 2016

[2] Wastewater Flow and Load assumptions for the future Crows Landing Industrial Business Park development phases memorandum, prepared by AECOM, July 6, 2017

[3] City of Patterson 2015-2023 Housing Element Update, adopted February 2, 2016



I:\J16125 CITY OF PATTERSON\TASKS\125-17B CLIBP EVALUATION\CAD\EXHIBITS\FIGURES\125_FIGURE 2.DWG PLOT: 8/8/2017 4:38:47 PM BY KEVIN WILLIAMS
CALIFORNIA AQUEDUCT
INTERSTATE 5
DELTA MENDOTA CANAL
ROGERS ROAD
LATERAL 6 SOUTH
S.P.R.R
SR-33
SPERRY AVENUE
WARD AVENUE

EXHIBIT C

Stantec

March 9, 2018

Robin Baral, Partner
Churchwell White LLP

Dear Robin,

Reference: Peer Review of the "Public Review Draft Crows Landing Industrial Business Park Specific Plan Environmental Impact Report" dated January 2018

The purpose of this proposal is to conduct a peer review of the "Public Review Draft Crows Landing Industrial Business Park Specific Plan Environmental Impact Report" report dated January 2018. 6-91

The traffic section of the EIR, Section 3.14, 5-30 to 5-36 and the full transportation report contained in Appendix F were reviewed. The traffic report is more comprehensive than the EIR so is generally discussed in more detail below. The comments are divided into two categories: (1) Minor clarifications and (2) Errors, defects or inaccuracies requiring correction.

(1) Minor clarifications

i. On Page 8 of transportation report, it says "A Crows Landing Project-Specific Model was developed based on the latest Tri-County Travel Demand Model and City of Patterson Travel Demand Model". On Page 20, it says "TJKM used the most current StanCOG model for the study". Patterson Model was not mentioned. Information should be consistent. 6-92

ii. On the 5th paragraph of Page 20, it says "The calibration effort of the Patterson model was pursed with this goal in mind". Not sure if the statement is applicable in this report. The report should state whether the City of Patterson GP land use buildout has been incorporated into the model. 6-93

iii. E. Las Palmas / W. Main Street – SR 33 to S. Carpenter Road, page 39, states "This western section of this roadway – from SR 33 to Poplar Avenue – is approximately 13,200 feet in length and has three lanes." This roadway traversed a major corridor in the City so we have requested that the long segment be split into two sections. This was not updated as agreed previously. 6-94

iv. LOS Threshold criteria and Jurisdictions should be added for all the Intersection LOS tables 6-95

v. Page 33, Table VIII, there are a few typos in the table. 6-96

vi. Page 34, Table IX, there is a typo for the segment 18 row. It's inconsistent from Table XI. 6-97

vii. Page 37, Table XI, the segment 16 should not be shaded for 2035 plus Project conditions. Please correct. 6-98

Design with community in mind

Reference: Proposal to Conduct Peer Review of "Public Review Draft Crows Landing Industrial Business Park Specific Plan Environmental Impact Report"

viii. Generally, many of the Table numbers in the Table titles are incorrect due to formatting errors. 6-99

(2) Errors, defects or inaccuracies requiring correction

i. **Existing Condition,** page 13 of traffic report indicated that intersection counts were conducted in January 2014. Typically, the acceptable "age" of traffic counts deemed acceptable by industry standard is 2-years but no more than 3-years in an area without much development. The count is currently more than 4-years old. The City of Patterson has been experiencing much developments in the past 3-4 years and recent traffic counts have confirmed traffic growth. 6-100

For example, Table III on page 14 of the report (incorrectly shown as Table IIIII), the LOS of I-5 SB Ramps / Sperry Ave during the PM peak hour was shown as LOS C. Recent counts in August 2017 has shown the intersection to operate at LOS F during the PM hour.

We have seen much traffic growth on Sperry Avenue in the past 2-3 years due to development of projects such as Amazon Warehouse, Pilot Flying J and etc. For example, a recent August 1-3, 2017 ADT count on Sperry Avenue (west of Park Center Drive) showed 15,300 vpd. An ADT count at the same location that was also conducted in March 2016 showed the volumes to be approximately 11,420 vpd. [1] Therefore, traffic growth is approximately 3,880 vehicles per day (vpd) within the 1.5-year period or growth of approximately 34 percent.

ii. **For Existing plus Project Conditions scenario**, Mitigation measures were not provided for the following intersections which would deteriorate from acceptable LOS D or better condition to LOS E or worse conditions: 6-101

Page 29: *Ward Avenue / Sperry Avenue (#7)* – the intersection would deteriorate from Existing LOS C to LOS F under Existing plus Project Conditions.

Page 23: *Table VII - Ward Avenue / Las Palmas Avenue (#8)* - the intersection would deteriorate from Existing LOS B to LOS E under Existing plus Project Conditions.

iii. **For 2035 plus Project Conditions scenario**

Table 5-5 of page 5-32 of EIR, the following intersections would deteriorate from acceptable LOS under 2035 No Project to unacceptable LOS E/F conditions under 2035 No Project conditions: 6-102

- 22 Marshall Road / Ward Ave,
- Ike Crow Road / SR 33
- Fink Road / Bell Road

Mitigation measures were not provided.

[1] *March 8, 2016*

Design with community in mind

Reference: Proposal to Conduct Peer Review of "Public Review Draft Crows Landing Industrial Business Park Specific Plan Environmental Impact Report"

v. **Project Only Model plot** 6-103
The model plots included in the appendix of the report dated October 13, 2017 showed total trips instead of project-only trips. We have previously requested Project Only model plot for checking fair share contribution calculations.

vi. **Fair share contribution** 6-104
The traffic study notes a degradation of the LOS at several key City intersections including:

- I-5 ramps/Sperry
- Ward Ave/Sperry
- Ward Ave/Las Palmas
- Sperry Ave/SR 33

Attached color coded map is based on intersection Fair Share %, % Project Traffic and roadway segment fair share information contained in the traffic report and EIR. Several roadways could expect to see an increase of nearly 20% or more CLIBP traffic. Project fair share at several intersections are more than 50%. 6-105

The project should pay for its fair share for maintenance or widening for all impacted roadways in the City.

Lastly, the following intersections were shown to be operating at LOS E/F under the 2035 with Project and 2035 without Project conditions in the previous 2016 report but are now shown as operating at acceptable LOS C/D or better under the current updated report: 6-106

- Ward Avenue / M Street (#9) - LOS F in the 2016 report to LOS D in this report under 2035 without Project conditions.
- Las Palmas Avenue / SR 33 (#13) - LOS D in the 2016 report to LOS C in this report under 2035 without Project conditions
- Walnut Avenue / SR 33 (#12) - LOS F/E in the 2016 report to LOS D/D in this report under 2035 with Project conditions.

Not sure if the current report corrected previous errors resulting in the improved LOS. The detailed LOS Calculation sheets were not provided in the Technical Appendixes so we were not able to verify.

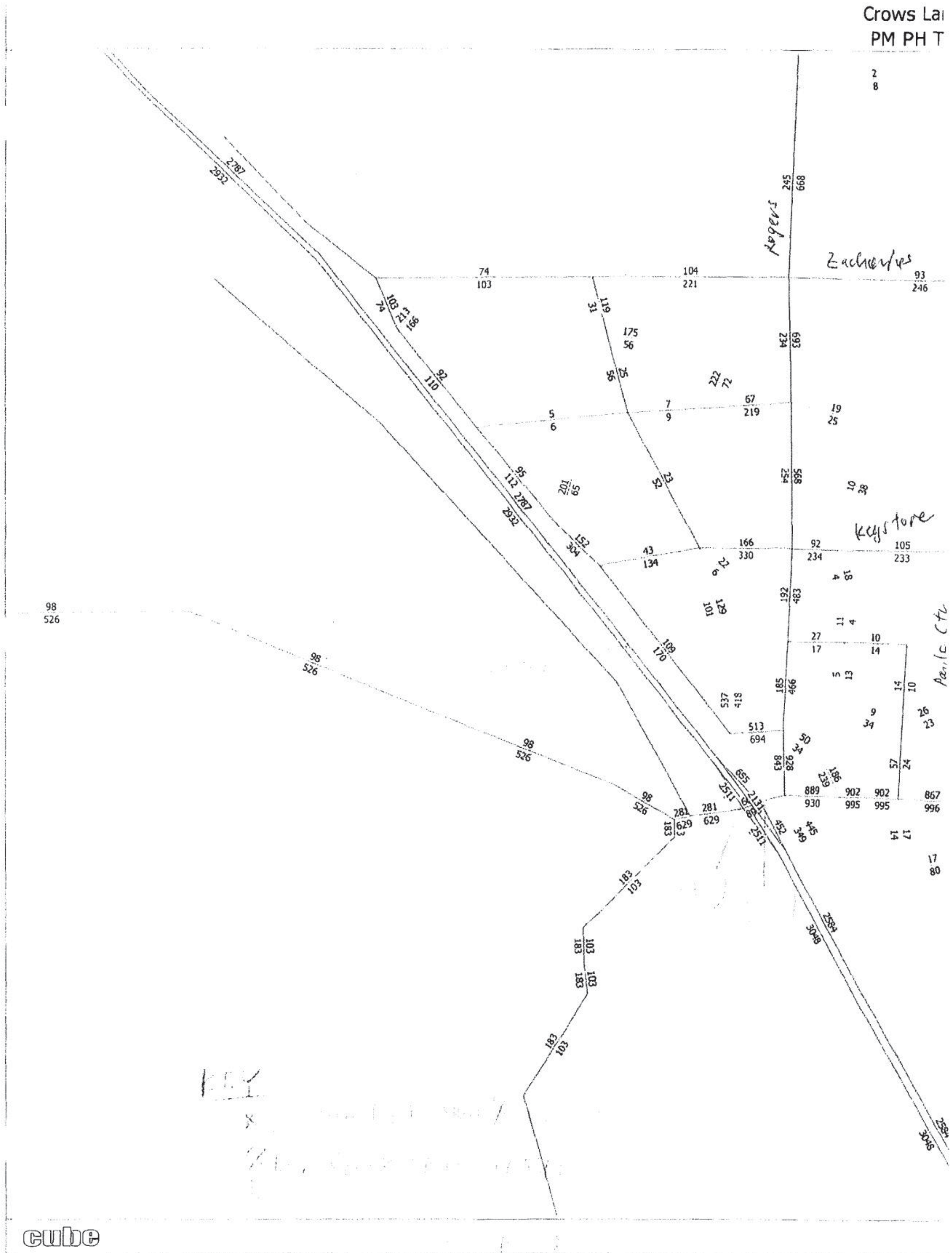
Please let me know if you have any questions.

Regards,

Christopher Thnay, PE, AICP
Senior Project Manager

ct v:\2073\active\2073015190\report\lr 030918 crows landing eir peer review.docx

Design with community in mind


Crows La
PM PH T
Rogers
Keystone
cube

Response to Comment Letter 6 – City of Patterson #2

Response to Comment 6-1

Beginning in early 2014, County staff reached out to the City and initiated regular meetings with City staff to discuss planning and anticipated projects in western Stanislaus County, as well as the Specific Plan. The County and City discussed regional coordination on planning, infrastructure improvements, and related topics. The County appreciates the amount of time invested in meeting and coordinating on these important topics. The County incorporated City input on the scope of analysis into the Draft EIR.

The County commissioned technical memoranda from City consultants and incorporated the information from this work into the Draft EIR, as well:

- Stantec. Tech Memo. *Peer Review of the Transportation Infrastructure Plan for the Crows Landing Industrial Business Park*. From Christopher Thnay, PE, AICP to Ken Irwin, City Manager, City of Patterson. August 22, 2017.

- Black Water Consulting Engineers, Inc. Technical Memorandum. *Potential Impacts to Patterson Wastewater Facilities from Crows Landing Industrial Business Park*. From Alison Furuya, P.E. and Jeff Black, P.E. to Ken Irwin, City Manager and Michael H. Willett, Director of Public Works [City of Patterson].

At the end of the initial public review period for the Draft EIR, the County received a request from the City to extend the comment period. The County extended the Draft EIR comment period at the City's request. The County was not aware of a future annexation to the City during these meetings or during the pre-project meetings or scoping for the Specific Plan and Specific Plan EIR. However, during the extended Draft EIR public review period, the City suggested that there could be an annexation proposal, and submitted a proposed Memorandum of Understanding to the County requesting that the County enter into a pre-annexation agreement and mutual waiver agreement.

The extensive City input into the Specific Plan and Specific Plan Draft EIR was helpful, and it is appropriate that both the EIR and the proposed Specific Plan reflect detailed analysis and input from City staff and the City's consultants. As detailed in the Draft EIR and Specific Plan, if the Specific Plan uses wastewater treatment capacity in the City's wastewater treatment facility, the County will coordinate closely with the City on the scope, cost, and timing of any required improvements. It is the County's desire to continue to work closely with the City to ensure mutually beneficial outcomes.

Following receipt of City comments on the Draft EIR, the County received a proposed Memorandum of Understanding (MOU) from the City that addressed transportation and wastewater services and did not identify any topics related to the adequacy of the Draft EIR for addressing adverse physical effects of the proposed Specific Plan. The County responded to the City's proposed MOU with a revised MOU on April 9, 2018. The County's proposed MOU outlines the understanding of the County regarding circumstances and conditions necessary for the City to provide wastewater treatment service to the Specific Plan Area, including fair-share contributions from the County for upgrades to City's WWTP necessary to serve the Specific Plan and wastewater infrastructure required to accommodate anticipated development in the Specific Plan.

See Responses to Comments 6-8 through 6-18 related to wastewater treatment. The Draft EIR includes Mitigation Measure 3.15-4 on page 3.15-17, which requires the County to demonstrate adequate wastewater treatment capacity prior to issuing any building permit for any project proposing to connect to public sewer or construct backbone sewer infrastructure connecting to the Western Hills Water District sewer line. The mitigation measure requires written documentation to verify that existing treatment capacity is, or will be, available to support the proposed development and that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy. Projects developed under the Specific Plan will be required to pay fair-share fees to the City of Patterson for wastewater treatment.

See Master Response 1 regarding the scope of analysis in the Draft EIR, including information related to employment associated with buildout of the Specific Plan. The Transportation Infrastructure Plan and Draft EIR Section 3.14 considered the impacts of both the Patterson General Plan buildout and the buildout of the Specific Plan in the analysis, and includes Mitigation Measure 3.14-1, which requires fair-share contributions to transportation improvements, including those in Patterson and serving traffic generated within, or attracted to uses in Patterson (page 3.14-16 of the Draft EIR).

Response to Comment 6-2

Please see Master Response 1 regarding the detailed project description, comprehensive and detailed analysis presented throughout the Draft EIR, and the analysis of possible growth inducing effects and cumulative effects related to full buildout of the Specific Plan. Please see Responses to Comments 6-49 and Comment 6-50 related to groundwater use, Responses to Comments 6-10 through 6-18 related to wastewater treatment and *Comment 6-58 related to alternatives.*

Response to Comment 6-3

Please see Responses to Comments 6-29 through 6-33, 6-34, and 6-43. Please also see Master Response 2.

Response to Comment 6-4

Responses to specific comments related to wastewater treatment, air quality, and traffic analysis are provided below and in Master Response 1. See Responses to Comments 6-29 through 6-33, 6-34, and 6-43 for a discussion of the detailed and comprehensive air quality analysis and mitigation included as a part of the Draft EIR. See Responses to Comments 6-10 through 6-18 related to wastewater treatment.

The comment is not specific to why the Specific Plan is inconsistent with Stanislaus County's agricultural mitigation policy.

See Responses to Comments 6-36 and 6-37 regarding agricultural resources.

Response to Comment 6-5

Recirculation of an EIR is required when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification (CEQA Guidelines Section15088.5). New information added to an EIR is not "significant" unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement.

"Significant new information" requiring recirculation includes, for example, a disclosure showing that:

1. (1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.

2. (2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.

3. (3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it.

4. (4) The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded. (*Mountain Lion Coalition v. Fish and Game Com.* (1989) 214 Cal.App.3d 1043).

Recirculation is not required where new information added to the EIR clarifies or amplifies or makes insignificant modification in an adequate EIR (CEQA Guidelines Section 15088.5(b)). Thus, recirculation is required only if changes are more than clarification or amplifications and rise to the level of significant new information outlined above. Chapter 3, "Errata," of this Final EIR corrects grammatical errors in the project description, the air quality section, and the utilities and service systems section; provides clarifications to the air quality and greenhouse gas methodology; provides clarifications and expands mitigation measures in the air quality section and utilities and service systems section; provides additional supportive information related to hazards associated with oil pipelines and wastewater infrastructure improvements; and updates air quality and greenhouse gas emissions modeling and electrical and natural gas demands. None of the revisions of the Draft EIR shown in Chapter 3 rise to the level of significant new information. Therefore, recirculation of the Draft EIR is not required. For the reasons stated in the Responses to Comments 6-7, 6-8, 6-9, 6-10, 6-15, 6-16, 6-17, 6-18, 6-21, 6-22, 6-23, 6-24, 6-26, 6-28, 6-29, 6-30, 6-31, 6-32, 6-33, 6-34, 6-35, 6-36, 6-37, 6.-38, 6-39, 6-40, 6-41, 6-42, 6-43, 6-44, 6-45, 6-46, 6-47, 6-48, 6-49, 6-50, 6-51, 6-52, 6-53, 6-54, 6-55, 6-56, 6-57, 6-58, 6-59, 6-60, 6-61, 6-64, 6-65, 6-66, 6-68, 6-71, 6-75, 6-76, 6-77, 6-79, 6-86, 6-87, 6-88, 6-92, 6-93, 6-94, 6-100, 6-101, 6-102, 6-105, and 6-106 below, no significant new information is required to be added to the EIR and recirculation is not required.

Response to Comment 6-6

This comment does not pertain to the analysis of impacts in the Draft EIR, but to the description of the project. Specific comments provided by the City of Patterson related to wastewater treatment are addressed in Responses to Comments 6-8 through 6-18, below.

Response to Comment 6-7

The type and placement of wastewater infrastructure, including wastewater treatment, are components of the proposed project, as identified in Chapter 2, "Project Description," Section 3.15, "Utilities and Service Systems," and are analyzed in the resource sections of the Draft EIR that analyze the project's significant environmental effects. Impact 3.15-3 describes the wastewater collection and conveyance infrastructure required to service the

Specific Plan and the potential use of on-site septic systems. As stated in Impact 3.15-3, each on-site septic system facility would need to be designed in accordance with Stanislaus County's Guidelines for Septic System Design, and the design would need to be approved by the County prior to the issuance of any building permits. The environmental impacts of construction and use of on-site septic systems, which are a component of the project, were analyzed in the Draft EIR as well. Where necessary, these sections identify mitigation measures to reduce or avoid the impacts of infrastructure construction and operation on the physical environment. Impact 3.15-4 discusses wastewater treatment for the Specific Plan's wastewater flows and acknowledges capacity improvements to the City's WQCF could involve environmental effects and provides a brief summary of those potential effects.

Please see Response to Comments 6-8 and 6-15 and Chapter 3, Errata." Please also see Master Response 1 for a description of the detailed project description and comprehensive and detailed analysis presented throughout the Draft EIR. Please also see Master Response 2 for a detailed discussion of mitigation.

Response to Comment 6-8

This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. A comprehensive analysis of wastewater treatment is provided in Section 3.15, "Utilities and Service Systems," of the Draft EIR. The Draft EIR includes Mitigation Measure 3.15-4 on page 3.15-17, which requires the County to demonstrate adequate wastewater treatment capacity prior to issuing any building permit for any project proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the Western Hills Water District sewer line. This mitigation measure requires written documentation to verify that existing treatment capacity is, or will be, available to support the proposed development and that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy. Projects developed under the Specific Plan will be required to pay fair-share fees to the City of Patterson for wastewater treatment.

The following revision has been made to the discussion of Impact 3.15-5 and Mitigation Measure 3.15-5 in Section 3.15, "Utilities and Service Systems," of the Draft EIR. Please see also Chapter 3 of this Final EIR, "Errata." These clarifications do not change the analysis or conclusions of the Draft EIR. Rather, these revisions clarify that written documentation showing proof that the Water Quality Control Facility (WQCF) has sufficient capacity will be provided to the satisfaction of the City. Therefore, recirculation of the EIR pursuant to CEQA Guidelines Section 15088.5 is not required.

IMPACT 3.15-5	Increased demand at City of Patterson Water Quality Control Facility (WQCF). *Implementation of the proposed project would result in an increase in wastewater flows that exceed the current City of Patterson WQCF design capacity. This impact is considered **significant**.*

Wastewater treatment for the proposed project is anticipated to be provided by the City of Patterson WQCF, which has a current design capacity of 2.25 million gallons per day (mgd) average dry-weather flow and a reliable treatment capacity of 1.85 mgd (~~Blackwater~~ Black Water Consulting Engineers 2017). As of 2016, the WQCF treats 1.44 mgd average dry-weather flow. The City has prepared improvement plans ~~and acquired land~~ for WQCF expansion to achieve a design capacity of 3.5 mgd, with a reliable capacity of 3.1 mgd.

Phases 1, 2, and 3 of the project could generate an average dry-weather flow of 0.394 mgd, 0.223 mgd, and 0.274 mgd, respectively, for a total of 0.891 mgd average dry-weather flow at site buildout (~~Blackwater~~ Black Water Consulting Engineers 2017). This estimate is based on accepted industry standard loading factors and input from the County of Stanislaus and the City of Modesto. The estimate is conservative and does not consider California Green Building Standards or the Specific Plan policies that reduce water use. Section 5.303 of the California Green Building Standards covers indoor water use and includes policies to reduce the overall use of potable water by 20 percent. Section 5.304 covers outdoor water use and requires irrigation controllers and sensors to reduce water use. Compliance with the California Green Building Standards would reduce water use and associated wastewater generation. The Specific Plan also promotes water efficiency and conservation, by encouraging energy star appliances, water sensitive design techniques, individual water metering, drought-tolerant and native plant landscaping, and by making reclaimed water available for cooling and other industrial uses.

The City of Patterson did not account for the project's wastewater flows in its planned design expansion to 3.5 mgd. Wastewater treatment capacity is allocated on a "first come, first serve" basis. Early phases of development would generate wastewater flows that could be accommodated by on-site septic systems as described above in Impact 3.15-4, or by the WQCF, if sufficient capacity is available. Because there are other approved and planned projects in the Patterson area, it is possible that capacity may need to be added to the WQCF to serve one or more phases of the proposed project, should these other projects break ground before the proposed project. The City's Wastewater Master Plan examines alternatives to expansion of the WQCF to handle 7.0 mgd and serve 76,000 residents, 675 acres of commercial development, and 2,227 acres of industrial development. Subsequent projects and leasehold development would be required to pay fair-share fees to the City of Patterson for wastewater treatment. Capacity expansion for the WQCF could be required to provide for the proposed project's long-term wastewater treatment demands. This impact is considered **significant**.

Mitigation Measure 3.15-5: Demonstrate Adequate Wastewater Treatment Capacity.

Before the County will issue any building permit for a use proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the WHWD sewer line, the project applicant ~~will~~ shall be required to provide written documentation to verify that existing treatment capacity is, or will be, available at the WQCF to support the proposed development. If treatment capacity is provided at the City of Patterson WQCF, projects within the Specific Plan Area shall contribute on a fair-share basis to the cost associated with such treatment capacity. Written documentation may include proof of executions of all financing agreements and/or other mechanisms, to the satisfaction of the City of Patterson, to ensure ~~and~~ that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy.

Implementation: Leaseholders/developers/contractors.

Timing: Prior to issuance of any building permits.

Enforcement: Stanislaus County.

Response to Comment 6-9

Appendix H is not an appendix to the Draft EIR; rather, Appendix H is an appendix to the Specific Plan.

As explained in the Sanitary Sewer Infrastructure and Facilities Study (see page 2), the County's Public Works Specifications require sewer systems to be designed according to the requirements of the sewer district in which the project is located. If the subject project is not in a sewer district, sewer systems must be designed using the City of Modesto's sanitary sewer standards, which serve as a proxy for design where there is no sewer district. As also stated, in cases where design guidelines and criteria are not provided by the City of Modesto, assumptions are made based on a comparative analysis of sewer generation rates for local cities and agencies, including the City of Modesto, and typical values published in the Wastewater Engineering Treatment and Reuse guidance document.

The City of Patterson's consultant, Black Water Consulting Engineers, provided a technical memorandum on August 25, 2017 that evaluated the potential impacts of the Specific Plan to the City's wastewater collection system and WQCF. The evaluation included a review of the City's Wastewater Master Plan dated April 2016 and other recently completed documents related to the City's wastewater facilities, and a review of the Wastewater Flow and Load assumptions for the future Crows Landing Industrial Business Park (CLIBP Wastewater Memo prepared by AECOM, July 2017). This Black Water Consulting Engineers technical memorandum does not mention the City of Modesto standards or recommend any changes to the wastewater flow assumptions underpinning the sewer analysis. Table 2 of the Black Water Consulting Engineers' August 25, 2017 Technical Memorandum provides an estimate of wastewater flow and load projections, with an average dry weather flow of 0.891 mgd, a peak dry weather flow of 2.673 mgd, and a peak wet weather flow of 2.799 mgd. These estimates are essentially the same as the estimates used in the Specific Plan analysis, as shown in the November 30, 2017 Crows Landing Industrial Park Sanitary Sewer Infrastructure and Facilities Study, which anticipates an average dry weather flow of 0.845 mgd, a peak dry weather flow of 2.537 mgd, and a peak wet weather flow of 2.663 mgd. The County believes the estimates used in the Specific Plan are more reasonable considering the range of uses planned, but Black Water's estimates are just 5 percent higher than the County's, and this would have no bearing on the infrastructure planned to serve the project at build out or any of the detailed environmental analysis in the EIR related to environmental effects associated with on- and off-site infrastructure improvements. Because the flow and load assumptions used by the County to identify infrastructure improvements were the nearly the same as anticipated by Black Water, presumably this is why Black Water's August 25, 2017 Technical Memorandum, which specifically reviewed the flow and load assumptions used by the County, does not recommend use of a different set of assumptions.

See Appendix G to this Final EIR, which is the Black Water Technical Memorandum reflecting the City of Patterson's consulting engineers' detailed review of the County's sewer analysis and master planning.

The analysis of wastewater collection, conveyance, and treatment impacts in Section 3.15, "Utilities and Service Systems," of the Draft EIR incorporates the findings of the Black Water memorandum. This comment does not affect the adequacy of the Draft EIR and does not change the conclusions of the Draft EIR. The Draft EIR contains a comprehensive analysis of significant environmental effects associated with all infrastructure improvements needed to serve the Specific Plan in the environmental analysis sections of Chapter 3. Specifically, the Draft EIR comprehensively analyzes potential effects associated with wastewater conveyance, including both on- and off-site components, as well as potential effects associated with improvements that may be needed at the City's wastewater treatment facility in Section 3.15, "Utilities and Service Systems." See Master Response 1 and pages 3.15-16 through 3.15-18 of the Draft EIR.

As stated in the Draft EIR, capacity improvements to the City's WQCF could involve environmental effects. Construction of new buildings or structures could change the aesthetic environment in the vicinity of the WQCF because new construction could involve additional lighting. If additional property is required to expand treatment capacity, this could convert farmland and conflict with Williamson Act contracts. It is possible that improvements could adversely affect Swainson's hawk foraging habitat, western pond turtle habitat, raptor nests, riparian woodland, or habitat for other rare plant and wildlife species. Construction and/or demolition activities could disturb previously unknown subsurface cultural resources and generate criteria air pollutant emissions, precursors, and greenhouse gas (GHG) emissions. Routine maintenance activities, ongoing operations, and employees commuting to the expanded facility would generate criteria air pollutant emissions, precursors, and GHG emissions, as well. It is possible that a capacity expansion could increase odor-generating potential. Existing regulations would likely prevent significant adverse effects to groundwater or surface water quality. It is possible that capacity expansion could be located in a floodplain. It is possible that a capacity expansion would require additional property. Depending on the design, location, phasing, and operations of the capacity expansion, there could be one or more direct or cumulative impacts.

In Section 3.2, Air Quality, the Draft EIR contains an analysis not only having to do with construction and operation of future land uses in the Specific Plan Area, but also construction of required transportation facilities, drainage facilities, and sewer conveyance and treatment facilities required to serve the Specific Plan Area.

Response to Comment 6-10

The commenter does not indicate the current wastewater flows treated at the WQCF and the Black Water memo also does not indicate the current wastewater flows treated at the WQCF; therefore, no revisions have been made to the Draft EIR to show the existing capacity is lower than the wastewater flows identified in Section 3.16, "Utilities and Service Systems," of the Draft EIR. See Response to Comment 6-9.

The City of Patterson WQCF has a current design capacity of 2.25 mgd average dry-weather flow and a reliable treatment capacity of 1.85 mgd (see page 3.15-16 of the Draft EIR). The WQCF treats 1.44 mgd average dry-weather flow and the City has prepared improvement plans for WQCF expansion to achieve a design capacity of 3.5 mgd, with a reliable capacity of 3.1 mgd (see page 3.15-16 of the Draft EIR). Phases 1, 2, and 3 of the project could generate an average dry-weather flow of 0.394 mgd, 0.223 mgd, and 0.274 mgd, respectively, for a total of 0.891 mgd average dry-weather flow at site buildout (Black Water Consulting Engineers 2017). Because there are other approved and planned projects in the Patterson area, it is possible that capacity may need to be added to the WQCF to serve one or more phases of the proposed project, should these other projects break ground before the proposed project. The City's Wastewater Master Plan examines alternatives to expansion of the WQCF to handle 7.0 mgd and serve 76,000 residents, 675 acres of commercial development, and 2,227 acres of industrial development. Subsequent projects and leasehold development would be required to pay fair-share fees to the City of Patterson for wastewater treatment. The WQCF may require additional capacity to provide for the proposed project's long-term wastewater treatment demands. Implementation of Mitigation Measure 3.15-5 ensures that adequate wastewater treatment capacity would be identified and documented for future projects under the Specific Plan.

Response to Comment 6-11

Impact 3.15-5 in Section 3.15, Utilities and Service Systems," of the Draft EIR states that subsequent projects and leasehold development would be required to pay fair-share fees to the City of Patterson for wastewater treatment, and Mitigation Measure 3.15-5 incorporates this requirement to ensure the funding is provided for any physical improvements to the WQCF. See Responses to Comments 6-8 through 6-18 related to wastewater treatment. See Response to Comment 6-9 for a discussion of the City's WQCF.

The Draft EIR includes Mitigation Measure 3.15-4 on page 3.15-17, which requires the County to demonstrate adequate wastewater treatment capacity prior to issuing any building permit for any project proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the Western Hills Water District sewer line. This mitigation measure requires written documentation to verify that existing treatment capacity is, or will be, available to support the proposed development, and that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy. Projects developed under the Specific Plan will be required to pay fair-share fees to the City of Patterson for wastewater treatment.

Response to Comment 6-12

Please see Response to Comment 6-15.

Response to Comment 6-13

Impact 3.15-4 in Section 3.15, Utilities and Service Systems," of the Draft EIR states that the County may allow tenants to construct on-site septic systems to accommodate their wastewater needs until wastewater treatment is available at the WQCF. In addition, Mitigation Measure 3.15-5 would ensure treatment capacity is, or will be, available at the WQCF to support the proposed development.

Please also see Response to Comment 6-8.

Response to Comment 6-14

Impact 3.15-5 in Section 3.15, Utilities and Service Systems," states the City has prepared improvement plans for WQCF expansion to achieve a design capacity of 3.5 mgd. Impact 3.15-5 further states that the City's Wastewater Master Plan examines alternatives to expansion of the WQCF to handle 7.0 mgd. There is no indication in Impact 3.15-5, or elsewhere in the Draft EIR, that the County is assuming the WQCF would be expanded beyond 3.5 mgd or that the City would implement the alternatives in the City's Wastewater Master Plan to expand the WQCF to 7.0 mgd to serve the Specific Plan Area. As stated on page 3.15-3 in Section 3.15, "Utilities and Service Systems," of the Draft EIR, additional WQCF expansion to 6.29 mgd will be required to treat wastewater flows at buildout of the city of Patterson and Diablo Grande.

Because there are other approved and planned projects in the Patterson area, it is possible that capacity may need to be added to the WQCF to serve one or more phases of the proposed project, should these other projects break ground before the proposed project (see p. 3.15-17 of the Draft EIR).

Response to Comment 6-15

The following revision has been made to Impact 3.15-4 in Section 3.15, "Utilities and Service Systems," of the Draft EIR in response to the Black Water comments. Please also see Response to Comment 6-8 and Chapter 3 of this Final EIR, "Errata." These edits clarify that temporary wastewater conveyance infrastructure will be used to serve the Specific Plan and do not change the analysis or conclusions of the Draft EIR. See Response to Comment 6-9 for a discussion of the City's WQCF.

IMPACT 3.15-4	**Increased demand for wastewater collection and conveyance facilities.** *Implementation of the proposed project would require the construction of on-site wastewater collection and conveyance facilities. The Specific Plan identifies the backbone infrastructure that will be provided by Stanislaus County. Subsequent projects and leasehold development in the Specific Plan Area will be required to demonstrate consistency with Specific Plan and County requirements as development occurs. The impact is* ***less than significant.***

Implementation of the proposed project would require construction of on-site wastewater collection and conveyance facilities. The *Crows Landing Industrial Business Park Sanitary Sewer Infrastructure and Facilities Study (*Sanitary Sewer Study*)* was prepared for the proposed project to identify wastewater collection and conveyance facilities design (VVH Consulting *Engineers* and AECOM 2016b).

Backbone wastewater collection and conveyance infrastructure facilities necessary to serve Phase 1 include gravity trunk mains, a 2.66-mgd sanitary sewer lift station southwest of the Marshall Road and State Route 33 intersection, a ~~0.065~~0.32-mgd sanitary lift station south of the airfield near the Delta Mendota Canal, and an 12-inch force main within Marshall Road to convey effluent to the existing off-site WHWD 18-inch trunk main in Ward Avenue. This temporary connection will be replaced with a permanent connection to the proposed South Patterson Trunk Sewer at the intersection of Bartch Avenue and Ward Avenue, as part of Phase 2. The gravity trunk mains, lift station, and force main would be sized to accommodate effluent from Phases 1, 2, and 3 (VVH Consulting Engineers and AECOM 2016b:9).

The proposed South Patterson Trunk Sewer would be designed to have sufficient capacity to accommodate flows at buildout of the Specific Plan. The City of Patterson would correct the pipeline deficiencies in the Ward Avenue trunk line at the intersection of Ward Avenue and M Street and upsize existing 21-inch sewer pipes to 24 inches prior to serving the Specific Plan (VVH Consulting *Engineers* and AECOM 2016b:19). New wastewater infrastructure would be constructed per design criteria identified in the City's Wastewater Master Plan.

During Phase 1A, the County may allow tenants to construct on-site septic systems to accommodate their wastewater needs until the backbone infrastructure has been completed. Each on-site septic system facility would need to be designed in accordance with Stanislaus County's Guidelines for Septic System Design, and the design would need to be approved by the County prior to the issuance of any building permits (See Section 3.8, "Geology, Soils, Minerals, and Paleontological Resources," for further discussion.) Backbone wastewater collection and conveyance infrastructure facilities required to serve Phases 2 and 3 include gravity trunk mains that will connect to existing sanitary sewer infrastructure constructed during Phase 1 (VVH Consulting Engineers and AECOM 2016b:9 and 10).

The Specific Plan identifies project buildout as it is envisioned to occur in three 10-year phases, and it describes the on- and off-site wastewater collection and conveyance facilities that will be required to support each phase. The County will construct backbone infrastructure to accommodate each phase of site development described in the Specific Plan. The County will not approve building permits for leaseholder development until infrastructure is available to support the proposed development.

The construction of the backbone infrastructure to be provided by the County has been considered as a component of the proposed project in the other sections of this EIR. Where necessary, these sections include mitigation measures to reduce or avoid the impacts of infrastructure construction and operation on the physical environment. No additional impacts will occur beyond those comprehensively considered throughout the other sections of this EIR. The impact is **less than significant.** No mitigation is required.

Response to Comment 6-16

Please see Response to Comments 6-9 and 6-15.

Response to Comment 6-17

The comment references Appendix H, as included in the Draft EIR; however, Appendix H is provided as part of the Specific Plan. Wastewater flows shown in Tables 3-5 and 3-7 of Appendix H are consistent with the wastewater flows shown Table 2 in the August 25, 2017 memo. No revisions are required to Tables 3-5 or 3-7 of Appendix H.

See Response to Comment 6-9 for a discussion of the City's WQCF.

Response to Comment 6-18

This comment does not affect the adequacy of the Draft EIR and does not change the conclusions of the Draft EIR. . However, this comment is published in this Response to Comments document for public disclosure and for decision maker consideration. The Draft EIR includes Mitigation Measure 3.15-4 on page 3.15-17, which requires the County to demonstrate adequate wastewater treatment capacity prior to issuing any building permit for any project proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the Western Hills Water District sewer line. The mitigation requires written documentation to verify that existing treatment capacity is, or will be, available to support the proposed development and that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy.

See also the Response to Comments 6-9 and 6-76 and Master Response 1.

Response to Comment 6-19

This comment does not affect the adequacy of the Draft EIR and does not change the conclusions of the Draft EIR. The Draft EIR includes comprehensive analysis of environmental effects associated with all infrastructure improvements needed to serve the Specific Plan throughout the environmental topic-specific sections of Chapter 3. More specifically, the Draft EIR comprehensively analyzes the potential effects associated with improvements that may be needed at the City's wastewater treatment facility in Section 3.15, "Utilities and Service Systems."

See Master Response 1 and pages 3.15-16 through 3.15-18 of the Draft EIR, in particular. Please also refer to Responses to Comments 6-1 and 6-9 above.

Response to Comment 6-20

All comments in the peer review of the Transportation Infrastructure Plan were addressed in the version of the Transportation Infrastructure Plan that was circulated at the same time as the Draft EIR, and any required revisions resulting from the peer review were included in the Draft EIR. Please see also Response to Comment 6-21, below.

Response to Comment 6-21

Although the report was prepared in 2014, the cumulative scenarios included the buildout of the most recent Patterson General Plan, which was adopted in 2010 and updated in 2014. The Specific Plan will build out over approximately 30 years, making the cumulative analysis central to understanding the project's transportation impacts and developing comprehensive mitigation. The use of cumulative analysis ensures that any projects constructed since 2014 have been accounted for in the Draft EIR analysis.

Response to Comment 6-22

All five locations referenced in the comment are study intersections analyzed in Section 3.14, "Traffic and Transportation," and/or Section 5.1, "Cumulative Impacts," in Chapter 5, "Other CEQA," of the Draft EIR. As discussed in those sections, some of those intersections have planned improvements or would be improved through implementation of mitigation measures. Where no improvements are needed, the LOS or other data supporting the recommendations are included in the Draft EIR (see Section 3.14, "Traffic and Transportation," of the Draft EIR) and the Transportation Infrastructure Plan, an updated version of which is Appendix A to this Final EIR. The transportation analysis in the Draft EIR is comprehensive and detailed, and Appendix A of this Final EIR provides additional detail on funding and implementation of necessary transportation improvements required to serve the Specific Plan at full buildout.

With regard to the specific intersections, (1) I-5 and Sperry Road is being planned for signalization; the traffic study identifies the Project fair share; (2) Ward Avenue and Sperry Avenue has no feasible mitigation due to the presence of residential development in the southeast quadrant – the traffic study indicates that the future South County Corridor (not accounted for in the analysis) will likely relieve Sperry Avenue congestion; (3) Ward Avenue and Las Palmas Avenue was recently improved and has no level of service issues in cumulative conditions; (4) Sperry Avenue and State Route 33 will require signalization, and the study identified the Specific Plan's fair share; and (5) Sperry Avenue and Rogers Road has no level of service issues.

The County commissioned the supplemental study by Stantec, which was developed under the City's direction, and the County's Specific Plan and Draft EIR incorporates each of the comments from this peer review. All appropriate revisions resulting from the peer review were included in the Draft EIR. Please see also Response to Comment 6-21.

Response to Comment 6-23

The Draft EIR includes analysis of the four intersections on Ward Avenue within the City of Patterson – at SR 33, at M Street, at Las Palmas Avenue, and at Sperry Avenue. The Draft EIR considers roadway segment levels of service at these intersections in Impact 3.14-1 in Section 3.14, "Traffic and Transportation," of the Draft EIR. The intersection levels of service and roadway segment levels of service without and with the project are shown in Tables 3.14-4 and 3.14-5, respectively. The portion of Ward Avenue in the County will not require widening beyond two lanes; within the City Limits the section between Las Palmas Avenue and Sperry Road can currently accommodate four lanes. South of Las Palmas Avenue the existing curb to curb width can accommodate a three-lane cross section. No additional widening should be required due to the project.

Please also see Master Response 1.

Response to Comment 6-24

The Transportation Infrastructure Plan considered the impacts of both the Patterson General Plan buildout and the buildout of the Specific Plan. As stated in Mitigation Measures 3.14-1 and 3.14-2 in Section 3.14, "Traffic and Transportation," of the Draft EIR, leaseholders/developers/contractors will contribute on a fair-share basis to fees to reimburse for off-site improvements and implementation will be directed by Stanislaus County. Project traffic impacts are accounted for on a fair-share basis; therefore project impacts would be fully mitigated. However, the County cannot guarantee that any improvement within the City of Patterson would be implemented because this decision would be within the jurisdiction of the City of Patterson. As a result the impacts are significant and unavoidable.

Please also see Response to Comment 6-20 and Master Response 1.

Response to Comment 6-25

The following revision has been made to Mitigation Measure 3.14-1 in in Section 3.14, "Traffic and Transportation," of the Draft EIR. Please see also Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR. Rather, these revisions clarify that the Sperry Avenue/SR 33 intersection is with the jurisdiction of Caltrans.

> Mitigation Measure 3.14-1: Off-site Traffic Signal or Roundabout Installations and Intersection Improvements.
>
> The following intersections are expected to meet signal warrants during peak-hour periods when the project is in place. The impact can be alleviated by installing traffic signals at the intersections where LOS would be degraded in exceedance of relevant thresholds. The affected jurisdictions can consider roundabouts as an alternative to traffic signals. The project shall contribute on a fair-share basis to the following improvements.
>
> <u>Phase 1</u>

- Signalize Intersection 14. Sperry Avenue / SR 33 (~~City of Patterson~~ Caltrans)
- Signalize Intersection 24. West Ike Crow Road / SR 33 (Stanislaus County)
- Signalize Intersection 26. Fink Road / Bell Road (Stanislaus County)
- Signalize Project Entrance / Fink Road (Stanislaus County)

Fink Road Interchange – Contribute on a fair-share basis to the improvement of the Fink Road interchange. Improvements recommended for the Fink Road interchange include signalizing the northbound ramps prior to completion of Phase 1 and widening the roadway beneath the freeway to create a westbound left turn lane at the southbound ramps intersection.

Phase 2

- Signalize Intersection 22. Marshall Road / SR 33 (Caltrans)
- Signalize Intersection 25. Fink Road at SR 33 (Stanislaus County)

Implementation: Leaseholders/developers/contractors will contribute on a fair-share basis to fee to reimburse for off-site improvements and implementation will be directed by Stanislaus County.

Timing: Prior to completion of Phase 1 and Phase 2, as specified.

Enforcement: Stanislaus County.

Significance after Mitigation

With the signalization of Intersections 24, 26, Project Entrance, 22, and 25, the resultant LOS would be LOS C or better. The impact at these intersections is considered **less than significant** with mitigation.

For Intersection 14, signalization would allow LOS of D or better. However, the County cannot guarantee that this improvement would be implemented since this would be under the jurisdiction of ~~the City of Patterson~~ Caltrans. This impact is **significant and unavoidable**.

The City mistakenly conflates the notation having to do with City versus Caltrans jurisdiction with substantial evidence supporting the Draft EIR conclusion. When mitigation measures call for improvements outside the lead agency's jurisdiction, often, it is not possible for the lead agency to guarantee their implementation, or to guarantee their implementation in a form that would address the impact at hand. This is true for this Draft EIR whether that outside agency is Caltrans or whether that is the City of Patterson. Making this editorial revision is irrelevant to the Draft EIR findings and the adequacy of the Draft EIR for addressing potential impacts associated with buildout of the Specific Plan. Based on the County's experience, it is likely that the improvements under Caltrans' jurisdiction can be successfully implemented, and therefore the EIR's finding could be considered conservative (i.e., would tend to overestimate the actual level of impact).

Response to Comment 6-26

The proposed Crows Landing Airport would be located outside of the city of Patterson, but a portion of the city would be located within the Airport Influence Area, as defined in the proposed Airport Land Use Compatibility Plan (ALUCP) Amendment, which was presented as Appendix C to the Draft EIR. See Appendix C, which includes the Airport Layout Plan and Narrative Report and the Proposed Compatibility Policies and Policy Maps to Amend the ALUCP.

The potential effect of adopting the proposed ALUCP on future development within the city of Patterson was considered in a detailed displacement analysis performed in support of the Draft EIR. The displacement analysis concluded that impacts would be less than significant. Refer in particular to pages 5-18 through 5-20 of the Draft EIR.

The City comment states that "the City must amend its general Plan and zoning to allow airport land users and comply with the Airport Land Use Compatibility Plan that was proposed." In effect, the City would be required only to amend its General Plan to be consistent with, not identical to, the ALUCP following adoption by the Airport Land Use Commission (ALUC). Government Code Section 65302.3 establishes that each county and city affected by an airport land use compatibility plan must make its general plan and any applicable specific plans consistent with the ALUC's compatibility plan. The City can make its General Plan consistent by adopting applicable ALUCP policies in one of the following ways: incorporate the ALUCP policies into existing General Plan elements; adopt relevant portions of the ALUCP as a stand-alone document, specifically the policies and maps; or create a separate General Plan ALUCP element or overlay zone.

A portion of the City lies within the Airport Influence Area (AIA) associated with the proposed Crows Landing Airport. The ALUC policies that apply to the AIA do not propose changes to the City's General Plan or Zoning code that would expose City residents to noise, light or other impacts from aviation uses. Rather, the goal of ALUC policies as defined by the State Aeronautics Act is "...to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses."

ALUCP policies address four compatibility factors: Noise, Safety, Airspace, and Overflight. As discussed in Draft EIR Section 3.12, "Noise and Vibration," and illustrated on ALUCP Map CRO-2, Noise Policy Map, the City does not include areas that would be exposed to aircraft noise above regulatory thresholds. See page 5-27 of the Draft EIR.

As shown on ALUCP Map CRO-3, ALUCP policies associated with safety zones also only apply to areas outside of the city of Patterson. Only policies associated with airspace protection and aircraft overflight would apply within the city limits. The portion of the city, including its General Plan area that is within the AIA occurs in Referral Area 2. Referral Area 2 includes locations where airspace and overflight may pose compatibility concerns, but not noise and safety (ALUC policy 1.3.2(b)).

- **Airspace.** ALUCP airspace protection policies seek to prevent the creation of land use features that can pose hazards to the airspace required by aircraft in flight and have the potential for causing an aircraft accident (see ALUCP Map CRO 4, Airspace Protection Policy Areas), such as tall structures and land uses that produce smoke, glare etc. (see ALUCP policy 3.4). The portion of the city's planning area within the AIA would be subject to airspace protection policies.

- **Overflight**. The overflight area encompasses locations over which approximately 80% or more of the aircraft fly. Overflight areas are not associated with aircraft noise exposure above regulatory thresholds or safety criteria. Overflight policies do not impose land use restrictions but require land owners to be notified about the presence of the airport or avigation easements may be required (see ALUC Policy 3.5 and ALUCP Map CRO 5, Overflight Zones Policy Map).

Only certain projects proposed within Referral Area 2 must be reviewed by the ALUC, such as those with the potential to could create obstructions to navigable airspace, create features that would increase wildlife hazards to aircraft operations, or create impaired visibility or electronic interference. ALUCP Policy 1.5.4, Major Land Use Actions, identifies proposed projects within Referral Area 2 that that will require ALUC review.

As noted, the Draft EIR considers potential displacement that would occur with the development of the ultimate airport buildout. No restrictions on residential development or residential displacement would occur within the City of Patterson.

Following adoption of the proposed ALUCP amendment to include the proposed airport, the City will be required to make its General Plan consistent with the ALUCP within 180 days to prevent future land use conflicts. Alternatively, the City may also overrule the ALUC policies based by a two-thirds vote of the City Council after it prepares specific findings to show that the City's plans are consistent with the intent of state airport land use planning statutes in the Aeronautics Act. If the City chooses to overrule the ALUCP, it must provide both the ALUC and the California Department of Transportation, Division of Aeronautics, with a copy of the local agency's proposed decision and findings at least 45 days in advance of its decision to overrule and must hold a public hearing on the proposed overruling (Public Utilities Code Section 21676(a) and (b)). The ALUC and the Division of Aeronautics may provide comments to the local agency within 30 days of receiving the proposed decision and findings. If comments are submitted, the local agency must include them in the public record of the final decision to overrule the ALUC (Sections 21676, 21676.5 and 21677). To overrule an ALUC decision, the local agency's governing body to make specific findings that show the project is consistent with the purpose of Article 3.5 of the State Aeronautics Act (SAA).

Response to Comment 6-27

As stated in Impact 3.11-3, in Section 3.11, "Land Use and Planning and Population, Housing, and Employment," of the Draft EIR, existing residents who are employed in the construction industry, as well as new residents that move to the area for other reasons, may be available to construct projects proposed under the Specific Plan during buildout (see p. 3.11-20 of the Draft EIR). According to labor data available from the U.S. Census Bureau's American Community Survey, 14,164 residents of Stanislaus County were employed in the construction industry in 2014 (p. 3.11-18 of the Draft EIR). The number of residents in Stanislaus County were employed in the construction industry has increased to 15,627 in 2016 (U.S. Census Bureau 2016.)

The duration of construction activities would vary over the 30-year Specific Plan buildout period. If construction workers residing outside the region were employed in the Specific Plan Area, the temporary nature of the work suggests that it would be unlikely that workers would change their residence to work at the proposed project site. Many construction workers opt to stay in hotels, rent individual rooms, or enter into short-term leases during the construction period. This is addressed in the Draft EIR and no additional information is necessary to address this topic as a part of the Final EIR.

Please refer to Response to Comment 6-28 and Master Response 1 for further discussion of potential housing impacts associated with implementation of the Specific Plan.

Response to Comment 6-28

Refer to Master Response 1 for a description of the detailed analysis presented throughout the Draft EIR and the analysis of possible growth inducing effects related to full buildout of the Specific Plan. While job growth in the city of Patterson has outpaced the nation by approximately 14 percent between 2012 and 2017, population growth itself was relatively low at approximately 3 percent over the same period of time (Emsi 2018). In 2015, approximately 72 percent of all employees working in Patterson lived outside of Patterson, with approximately 28 percent of all employees (all job categories) both living and working in Patterson. Therefore, while jobs have been created in the city, residents are not necessarily moving to Patterson to take those jobs.

The decision in *Napa Citizens for Honest Government v. Napa County Bd. of Supervisors*, 91 Cal.App.4th at p. 342 (2001), held that the potential physical impact of new housing related to a job-rich project, (i.e., a specific plan for a 2,000-acre industrial/business park near Napa County Airport) is a topic for consideration in an EIR. That court found that the business park's Final Subsequent EIR (FSEIR) was "required to discuss such housing needs as reasonably might be generated by the project, but not in great detail." The court concluded that:

> "… in order to fulfill its purpose as an informational document, the FSEIR should, at a minimum, identify the number and type of housing units that persons working within the Project area can be anticipated to require, and identify the probable location of those units. The FSEIR also should consider whether the identified communities have sufficient housing units and sufficient services to accommodate the anticipated increase in population. If it is concluded that the communities lack sufficient units and/or services, the FSEIR should identify that fact and explain that action will need to be taken to provide those units or services, or both. Because it cannot be known if the Project will cause growth in any particular area, and because the Project most likely will not be the sole contributor to growth in any particular area, it is not, however, reasonable to require the FSEIR to undertake a detailed analysis of the results of such growth."

The Draft EIR evaluates the impacts associated with projected employment growth under the proposed project, but it is outside of the scope of the Draft EIR to attempt to predict certain details about future employees. Approximately 17,000 workers from the manufacturing, transportation, and wholesale sectors live within a 30-minute drive of the site. The proposed project would provide over 60,000 residents in the Stanislaus, San Joaquin, and Merced Counties with an alternative to traveling to distant work centers in the Bay Area, Sacramento, or elsewhere. It is not possible for the County to determine the location or extent of possible future residential development associated with project-related employment and it would be speculative to determine such details. Some future employees of the Specific Plan Area may live in existing housing and others may live in newly constructed housing. Some may choose to live close to the Specific Plan Area and some at a greater distance. Therefore, the Draft EIR concluded no additional feasible mitigation is available to reduce this impact to a less-than-significant level without changing the purposes of the proposed Specific Plan, and the impact is considered significant and unavoidable (p. 3.11-2 of the Draft EIR).

In addition, please refer to Master Response 1, which provides additional updated detail on planned and forecast housing and employment in the region. Please refer also to the County's General Plan policies, which are referenced throughout Chapters 3 and 5 of the Draft EIR, and include policies that would reduce potential environmental effects associated with future development throughout the unincorporated County, including future housing development.

Response to Comment 6-29

To support economic development in Stanislaus County, the CLIBP Specific Plan promotes the development of land uses that will support job creation in several of the industries that currently cause its residents to commute. The Specific Plan promotes flexibility in the types of permitted land uses, as well as the size and location of those land uses. The CLIBP is envisioned primarily as a mixed-use industrial business park designed to support a variety of light industrial, logistics, warehouse, distribution, office, and aviation-related land uses. The Specific Plan identifies land uses permitted within each broader land use category. Only the general aviation airport, which will be constructed to reuse a former military runway (Runway 12-30), is fixed by size and location. Section 2.2 of the Specific Plan (pages 2-1 through 2-7) details allowable land use for the Specific Plan, and more specific permitted uses can be reviewed in detail in Appendix B to the CLIBP Specific Plan (Tables B-1 and B-2). Considering the array of allowable uses, as specified within Appendix B to the CLIBP Specific Plan, it is reasonably conservative to assume that up to 20 percent of the trucks supporting General Light Industrial land uses would be equipped with transport refrigeration units. In addition, because some of the potential future land uses (*e.g.*, distribution centers, light industrial) could involve vehicle fleets (*i.e.*, heavy duty trucks for operations) that differ from the Stanislaus County average vehicle fleet, the analysis summarized in the Draft EIR increased the heavy-duty truck percentage of those land uses, to further ensure the analysis did not underestimate these mobile source emissions.

Upon further consideration of the assumption of transport refrigeration unit use in trucks associated with the Refrigerated Warehouse land uses, the assumption of 60 percent is still considered high. However, to be even more conservative, the analysis was revised to assume that 100 percent of trucks associated with the Refrigerated Warehouse land use would be equipped with transport refrigeration units. The assumptions, analysis, and emissions estimates have been updated in the EIR to reflect the revision to this assumption. This updated assumption has been revised on page 3.2-21 of the EIR (Section 3.2.3, "Methodology" of the Air Quality section of the Draft EIR). In addition, the operational air pollutant emissions estimates have been revised in Table 3.2-9 to reflect this revised assumption (see pages 3.2-29 to 3.2-30 of the Draft EIR). The revised assumption does not change the impact findings or mitigation of the Draft EIR. Please see also Chapter 3 of this Final EIR, "Errata."

Response to Comment 6-30

The unemployment rate in Stanislaus County has been higher than the statewide average for many years. Many residents commute to distant job centers outside of the County, frequently traveling to Sacramento and the San Francisco Bay Area (Bay Area). A 2014 analysis of commuting patterns in the northern San Joaquin Valley, which includes San Joaquin, Stanislaus, and Merced counties, indicated that approximately 23 percent of Stanislaus County's employed residents commute outside of the County, and 9 percent commute to San Francisco Bay Area communities (University of the Pacific 2014). The five employment sectors with the highest proportion of residents traveling outside of the County to work were construction; transportation, warehousing and utilities; public administration; wholesale trade; and manufacturing. The County's intent is to facilitate employment development and Objective 2 of the Specific Plan is to "Create a regional employment center on the former Crows Landing Air Facility property, conveyed to Stanislaus County through Public Law 106-82, that will promote development, and reduce greenhouse gas emissions by bringing jobs closer to County residents." The Specific Plan could accommodate employment options in three of the five industries where there is the most out-commuting by residents: industrial uses, including manufacturing and assembly; transportation and warehousing (logistics); and public administration/facilities, including public administration offices, law enforcement, and public safety services.

While it was estimated that the development of these specifically identified employment opportunities within the Specific Plan area could help reduce commute distances by 50 percent for 50 percent of the future employees of the project, this discussion of reduced commutes was provided for contextual narrative of an objective of implementation of the Specific Plan, but was not used for quantitative analysis of air quality impacts. The analysis of operational air pollutant emissions presented under Impact 3.2-1 (page 3.2-28 through 3.2-32) explains that, while the project may provide air quality benefits by reducing the amount of commute-related vehicle miles traveled (VMT) by Stanislaus County residents who would choose to work at the CLIBP instead of more distant locations, it is not possible to quantify these benefits for the purposes of the transportation, energy, greenhouse gas emissions, or air quality analysis presented in the Draft EIR, as neither the specific land uses nor the location of future employees of the CLIBP are currently known. The VMT used to estimate emissions associated with the Specific Plan was not discounted to reflect the potential jobs-housing balance benefits of the Specific Plan (refer to Appendix F for details on the assumptions used for greenhouse gas and criteria air pollutant emissions analysis). Therefore, the operational air pollutant emissions results presented within the Draft EIR might overestimate the actual impact of the project. The Draft EIR analysis on this topic is conservative.

An objective of the Specific Plan and specific policies associated with implementation of the Specific Plan would reduce regional VMT, but to maintain a more conservative analysis, a reduction in VMT was not considered for the purposes of quantifying air pollutant emissions within the Draft EIR. It would not be appropriate to make any revision to the EIR. As with the balance of the Draft EIR, the approach to VMT-related impacts was conservative (tending to overstate potential effects). The actual VMT and VMT reduction benefits of the Specific Plan will be influenced by congestion, commute times, the price of fuel, housing prices and availability, wages, and other social and economic factors over which the County does not have control. VMT can be an indicator of potential adverse physical environmental effects. Please refer also to Section 3.2 of the Draft EIR, "Air Quality," which comprehensively analyzes and provides feasible mitigation for air pollutant emissions related to VMT; Section 3.7, "Greenhouse Gas Emissions," which comprehensively analyzes and provides feasible mitigation for greenhouse gas (GHG) GHG emissions associated with VMT; and Section 3.12, "Noise and Vibration," which comprehensively analyzes and provides feasible mitigation for noise and vibration impacts associated with VMT. Please also see the discussion of transportation energy use in Section 3.6 of the Draft EIR, "Energy."

Response to Comment 6-31

The description of odor emissions and how they would "move around the project site" is in the context of the discussion of construction-related odor emissions under Impact 3.2-4 (page 3.2-30 of the EIR). The assumption only applies to construction activities, which are of finite duration and would occur in different locations throughout the Specific Plan Area as development occurs over time. The Impact 3.2-4 discussion explains the assumption and its applicability to the analysis and provides additional justification for the significance findings, including the requirement that all projects would be required to comply with San Joaquin Valley Air Pollution Control District Rules and Regulations pertaining to odorous emissions. It would not be appropriate to make any revision to the EIR.

Response to Comment 6-32

Please refer to Response to Comment 6-29, Response to Comment 6-30, and Response to Comment 6-31.

Response to Comment 6-33

Mitigation Measure 3.2-1b (page 3.2-30 of the Draft EIR, now labeled Mitigation Measure 3.2-1c) is to "*Reduce the Single Occupant Vehicle Commute*," and Mitigation Measure 3.2-2b is to "*Implement Mitigation Measure 3.2-1b*." Mitigation Measure 3.2-1b identifies specific actions, including participation in a Transportation Demand Management (TDM) or similar program by all employers operating within the Specific Plan Area. Consistent with this mitigation measure, Section 4.2.4, *Transportation Demand Management*, of the Specific Plan describes the Transportation Demand Management (TDM) program that will be prepared for the operations within the Specific Plan Area. As described in the Specific Plan, participation in the TDM program will be mandatory for all employers operating within the Specific Plan, thereby resulting in greater use of alternative modes of transportation (to use of single occupant vehicles) for commuting to work and promoting overall more sustainable transportation modes within the Specific Plan Area and surrounding community. This program is specifically identified as Transportation Policy TP 11 of the Specific Plan. This action would be enforceable by Stanislaus County as a Specific Plan policy and Mitigation Measure 3.2-1b will be enforced through the Mitigation Monitoring Program and the requirement to demonstrate compliance with this mitigation prior to issuance of a business license to any employer within the Specific Plan Area (see the revised version of Mitigation Measure 3.2-1c in Chapter 3 of this Final EIR).

In addition, as part of this Mitigation Measure 3.2-1b, the County will provide transit service to the Specific Plan Area. As the County oversees implementation of local transit services, this action is within the jurisdiction of Stanislaus County to enforce.

As detailed in Chapter 3 of this Final EIR, Mitigation Measure 3.2-1a has been split into two separate mitigation measures to clarify enforcement responsibilities for two distinct parts of the previous Mitigation Measure 3.2-1a. Mitigation Measure 3.2-1a from the Draft EIR is now Mitigation Measures 3.2-1a and 3.2-1b. Compliance with requirements of the Air District's Rule 9510 is under Mitigation Measure 3.2-1a, with the Air District responsible for enforcement oversight. The newly labeled Mitigation Measure 3.2-1b addresses the types of construction equipment used, and the County would be responsible for enforcement oversight. As a result, the Draft EIR's Mitigation Measure 3.2-1b, "*Reduce the Single Occupant Vehicle Commute*," is now labeled as Mitigation Measure 3.2-1c and the mitigation language has been revised, as shown in Chapter 3 of this Final EIR.

In addition, the County has added Mitigation Measure 3.2-1d, "*Provide Transit to the Workplace*." This new mitigation measure requires the County to provide transit service to the Specific Plan Area.

Although TDM programs have been shown to be effective in reducing VMT (Federal Highway Administration 2012), the County acknowledges that, while it can enforce implementation of the actions identified within Mitigation Measure 3.2-1b, such enforcement does not guarantee choices made by employees and residents to use proposed programs and services. The impact discussions, and particularly discussions of significance after mitigation for Impact 3.2-1 and Impact 3.2-2 (pages 3.2-28 through 3.2-34 of the Draft EIR), provide more extensive detail on how this mitigation was applied to the analysis of air quality impacts. The analysis qualitatively discusses potential emissions reduction with implementation of the referenced mitigation measures. However, the analysis ultimately states that it is not possible to accurately quantify the potential emission reductions, and impacts are found to be significant and unavoidable. The intent of these mitigation measures is for the County to mitigate potential impacts, even if it cannot avoid or control them in all cases. It would not be appropriate to make any revision to the Draft EIR, other than the above described revisions to the mitigation measures.

Response to Comment 6-34

Impact 3.2-3 in Section 3.2, "Air Quality," of the Draft EIR provides detailed analysis of the potential operational emissions of TACs, including stationary sources, manufacturing processes, diesel-fueled heavy-duty trucks associated with goods distribution, and commuter trips involving diesel-fueled vehicles. See pages 3.2-34 through 3.2-39 of the Draft EIR. Potential sensitive receptors identified in the analysis include potential future daycare centers for employees' children and existing sensitive land uses, such as residences, near the project site. The analysis of potential exposure of sensitive receptors to potential future sources of TACs included use of ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (ARB 2005), ARB regulatory and incentive programs to reduce diesel PM emissions throughout the state, and San Joaquin Valley Air Pollution Control District Rules and Regulations; these policies and regulations are further detailed in Section 3.2.2, *Regulatory Framework*, of the Draft EIR.

Note that, contrary to the commenter's statement, the Specific Plan does not provide connection to the rail and is not anticipated to result in increased rail trips to serve the Specific Plan Area. Therefore, no such emissions estimates were included in the Air Quality analysis. The proposed Specific Plan does not include a rail terminal, spur, or other infrastructure/connection to the off-site rail line (east side of State Route 33). Although previous project designs (prior to development of the Specific Plan) had considered a potential connection, that idea was eliminated based on a desire to provide a project footprint that remained within the boundaries of the former military site.

Mitigation Measure 3.2-3a and Mitigation Measure 3.3-2b are included to minimize potential exposure of sensitive receptors to TACs from future operational activities. Mitigation Measure 3.2-3b ensures that projects proposed within 1,000 feet of an existing daycare or an off-site residence are required to analyze and report on potential health risk impacts of $PM_{2.5}$ and TAC concentrations from long-term operations prior to the issuance of a building permit for new construction, tenant improvement, or change of use. If health risk impacts are determined to exceed District thresholds of significance under any potential operational exposure scenario, projects shall implement Mitigation Measure 3.2-3c, which requires identification and implementation of strategies to reduce impacts below applicable District thresholds of significance.

Regarding future aircraft use of the existing runway, the analysis has been revised to more clearly identify this emission source as a potential source of TACs and discuss associated impacts (see Chapter 3 of this Final EIR, "Errata," for specific clarifications). The County has clarified the analysis related to aircraft emissions and the potential level of operations that could take place at the proposed airport. Analysis of potential health impacts associated with these emissions has been added to the impact discussion. Impact 3.2-3 was considered potentially significant in the Draft EIR and mitigation was provided to identify TAC impacts associated with operational activities and specific performance criteria to ensure that impacts would be less than significant with mitigation. Mitigation as proposed within the Draft EIR applies to the discussion of aircraft operations as well, and remains applicable to the revised discussion. This edit does not change the impact findings or mitigation of the Draft EIR.

Please also refer to Master Response 2.

Response to Comment 6-35

The emissions estimates for construction-related and operational activities associated with implementation of the Specific Plan have been revised using the most recent CalEEMod Version 2016.3.2. This revision does not change the analysis or conclusions of the Draft EIR. Please refer to Response to Comment 7-2 and Chapter 3 of this Final EIR, "Errata," shows text revisions that indicate the most recent CalEEMod Version 2016.3.2 was used in the analysis)

Response to Comment 6-36

As discussed in Section 3.3, "Agricultural Resources," of the Draft EIR, pursuant to Objective Number 2.4 of the County's Agricultural Element, under CEQA the County has "discretion in determining whether the conversion of agricultural land will have a significant adverse effect on the environment" (page VII-23 of the County's Agricultural Element). The County's policy approach in relation to agricultural conservation easements is particularly focused on residential development that converts agricultural land. In establishing the agricultural easements that would be used for residential projects, but not for non-residential projects, the County's General Plan policies indicate that this particular tool is not appropriate for use in projects that would result in employment.

While the County supports the establishment of agricultural conservation easements as a complement to its suite of policies that promote the agricultural economy and agricultural conservation, the County is also obligated to balance agricultural conservation strategies with other objectives, such as economic development (in non-agricultural sectors) and local job growth. The additional cost associated with agricultural conservation easements would represent a constraint to employment development, which is another policy priority of Stanislaus County, and is therefore infeasible. Therefore, the County has not proposed mitigation for the conversion of agricultural land to non-agricultural uses.

Please also see Response to Comment 6-62.

Response to Comment 6-37

Please see Response to Comment 6-28, Comment 6-61, and Master Response 1.

Response to Comment 6-38

The Specific Plan would not "cause changes in migration and the flight path of avian species in the area" as stated by the commenter. The Specific Plan does not include elements that would attract wildlife, as explained in Section 3.9, "Hazards and Hazardous Materials." As discussed in Impact 3.4-3, the 2016 ALUCP provides countywide policies for Airspace Protection, including Policy 3.4.3, "Other Flight Hazards (glare, distracting lights, dust, steam, electrical interference, wildlife hazards)," which further ensures against impacts raised by the commenter.

The ALUCP also includes procedural policy 1.5.4, which would require the ALUCs to review major land use actions that would create habitat or other attractants to birds and other wildlife.

> Policy 1.5.4. Major Land Use Actions

The scope or character of certain Major Land Use Actions, as listed below in Paragraphs (a) through (e), is such that their compatibility with Airport activity is a potential concern. Even though these actions may be basically consistent with the local general plan or specific plan, sufficient detail may not be known to enable a full airport compatibility evaluation at the time that the general plan or specific plan is reviewed. To enable better assessment of compliance with the compatibility criteria set forth herein, ALUC review of these actions may be warranted. The circumstances under which the ALUC review of these actions is to be conducted are in Policies 1.5.2 and 1.5.3 above.

a. Actions Affecting Land Uses within Referral Area 1: (Thirteen land use actions are listed, no. 11 applies)

(11) Any project or plan (e.g., Habitat Conservation Plan) proposing open water areas or landscaping features having the potential to cause an increase in the attraction of birds or other wildlife that can be hazardous to aircraft operations in the vicinity of the airport.

b. Actions Affecting Land Uses within Referral Area 2: Only the actions listed in Paragraphs (a) (10) through (a) (13) apply.

The ALUCP also includes procedural policy 2.3.1, which would require project applicants to identify project features that have the potential to attract hazardous wildlife.

2.3 Review Process for Major Land Use Actions

Policy 2.3.1 Required Submittal Information: A proposed Major Land Use Action referred to for ALUC (or ALUC Secretary) shall review the following information to the extent applicable…

(e) Identification of any features, during or following construction, that would increase the attraction of birds or cause other wildlife hazards to aircraft operations at the Airport or intis environs (see Policy 3.4.3) Such features include, but are not limited to the following:

(1) Open water areas

(2) Sediment ponds, retention basins

(3) Detention basins that hold water for more than 48 hours

(4) Artificial wetlands

The application of ALUCP policies would prevent conflicts with proposed land uses with regard new hazards to flight associated with airspace/obstructions, wildlife, and other flight hazards.

As discussed on page 3.4-26 in Section 3.4," Biological Resources," of the Draft EIR, no established migratory routes have been identified on the project site Biologists surveyed the site on November 26 and December 26, 2013, and on October 18, 2016, and determined that the project site and off-site improvement areas provide only low value habitat for most wildlife species because of an overall lack of native vegetation and natural communities, and a high level of disturbance. The bird species most likely to use the project site and off-site improvement areas are primarily common species that are adapted to highly disturbed, ruderal, or agricultural environments. Agricultural fields on the project site provide foraging opportunities for a number of raptor species, and scattered trees remaining on site also offer nesting opportunities for raptors and other birds. However, the site does not provide connections between areas of natural habitat that would affect avian flight paths, nor is the site within any avian migratory routes.. Studies of raptor responses to airport noise and disturbance do not support the conclusion that regular use of the airport at the project site would adversely affect resident and wintering hawks, owls, and vultures. Manci et al. 1998 and Ellis et al. 1991 found that most raptors did not show a negative response to overflights, and did not find detrimental effects of aircraft use on raptor distribution, breeding success, or behavior.

Response to Comment 6-39

The Control Tower was evaluated in 1998 as part of the Inventory and Evaluation of Cold War Era Historical Resources, NASA Crows Landing (SAIC 1999). At the time, it did not meet any National Register of Historic Places (NRHP) criteria (A-D) in specific relation to the Cold War-era military development and operations context. The previous study also did not indicate any potential for future significance of the resource after it turned 50 (i.e., it did not indicate any significance, including any significance that would qualify it for additional evaluation under Criteria Consideration G as a resource less than 50 years old). Based on updated research (2015), the recent survey and evaluation of historical resources for this Draft EIR did not identify any additional contexts that could apply to this resource. Therefore, there are no new criteria that may apply. The reporting states: "Similar to the previous NRHP evaluation, the control tower presently does not meet the criteria for the California Register of Historical Resources (CRHR) or as a historical resource for purposes of CEQA because it lacks integrity." An architectural historian who meets the qualifications of the Secretary of the Interior's Professional Qualifications Standards (36 C.F.R. Part 61) conducted the 2015 survey. Based on the condition of the resource and the substantial alteration of the resource's setting, the architectural historian determined that the Control Tower lacked integrity, which is a requirement to be eligible for the CRHR. The architectural historian identified five aspects of diminished integrity: design, setting, materials, feeling and association. The 2015 criteria evaluation and integrity assessment are sufficient for the purposes of this project, as there was no indication through research and survey that the Control Tower had accumulated additional historical significance since it was recorded in 1998 that would make the diminished level of integrity sufficient for eligibility or warrant a comprehensive evaluation effort under each CRHR criterion. Hence, the Control Tower is not eligible for the CRHR because it exhibits no new significance in relation to the established Cold War context or to any newly identified contexts to be eligible under any of the NRHP/CRHR criteria, and because it does not retain sufficient integrity to be eligible.

Response to Comment 6-40

The Draft EIR both evaluates energy demand of the Specific Plan at buildout to existing conditions *and* evaluates the relative energy efficiency of the Specific Plan at buildout, as clearly summarized throughout Section 3.6 of the Draft EIR. See in particular pages 3.6-7 through 3.6-10 of the Draft EIR.

CEQA Guidelines, Appendix F, provides guidance for assessing impacts related to energy supplies, focusing on the goal of conserving energy by ensuring that projects use energy wisely and efficiently. Appendix F requires the potentially significant energy implications of the project to be considered in an EIR to the extent feasible, and provides a list of energy impact possibilities and potential conservation mitigation measures. As noted in Appendix F, the discussion in the EIR should have a particular emphasis on inefficient, wasteful and unnecessary consumption of energy.

In accordance with this guidance, energy impacts in the Draft EIR are considered significant if the proposed project would “develop land uses and patterns that cause wasteful, inefficient, and unnecessary consumption of energy” or “encroach on the Fink Road landfill and waste-to-energy plant in a way that would adversely affect operations or ability to expand.” Impact 3.6-1 includes detailed analysis of building energy consumption (pages 3.6-7 through 3.6-9). In addition, appropriate to the guidance outlined in Appendix F of the CEQA Guidelines, the impact analysis identifies characteristics of the proposed future development that relate to energy efficiency, including identification of design goals of the Specific Plan (D20 and D21) that are additional energy efficiency measures beyond those quantified by the land use modeling done for the DEIR. The discussion also identified State regulations focused on development within California that would increase energy efficiency of future buildings as compared to existing buildings by increasing the percentage of energy generated by renewable sources.

The physical impacts associated with the generation and use of energy are documented in detail throughout the Draft EIR. For example, generation of non-renewable electricity is an indirect source of criteria air pollutant and greenhouse gas emissions, and these impacts are analyzed, reported, and mitigated as a part of the County’s development of Sections 3.2 (Air Quality) and 3.7 (Greenhouse Gas Emissions).

The analysis of energy use is consistent with CEQA and the CEQA Guidelines; therefore, it is not necessary and would not be appropriate to make any change to the EIR.

Response to Comment 6-41

As stated in Section 3.6.3, *Impacts and Mitigation – Methods of* Analysis, future energy demand was calculated based on proposed land uses within the Specific Plan and modeling conducted using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use. The model was developed for the California Air Pollution Officers Association (CAPCOA) in collaboration with the California Air Districts. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California Air Districts to account for local requirements and conditions. CalEEMod is recommended for use by the San Joaquin Valley Air Pollution Control District.

Impacts related to energy demand that would result from implementation of the proposed project were identified by evaluating the proposed project’s total demand at full buildout. As further described in Section 3.7.3, which is referenced in the methodology section of the energy analysis, the average warehouse size in California, which was based on the California Energy Commission’s (CEC) *Benchmarking Study of the Refrigerated Warehouse Industry Sector in California* study, was used to estimate the number of warehouse facilities that could be developed within the Specific Plan Area. Please see Section 3.6.3 of the Draft EIR for the complete description of analysis methodology. It would not be appropriate to make any change to the EIR.

Response to Comment 6-42

Refer to Response to Comment 6-33 and Master Response 1. While the discussion of potential reduced VMT is important for the Specific Plan, as clearly stated in the Draft EIR, the analysis makes the conservative assumption that no benefit to emissions or energy use occurs from the Specific Plan. Rather, the analysis conservatively assumes no reduced transportation demands from the Specific Plan. See pages 3.2-29 and 3.2-30.

As stated in the Draft EIR, the unemployment rate in Stanislaus County has been higher than the statewide average for many years. The five employment sectors with the highest proportion of residents traveling outside of the County to work are construction; transportation, warehousing and utilities; public administration; wholesale trade; and manufacturing. The Specific Plan is designed to accommodate employment options in three of the five industries where there is the most out-commuting by residents: industrial uses, including manufacturing and assembly; transportation and warehousing (logistics); and public administration/facilities, including public administration offices, law enforcement, and public safety services. However, the transportation analysis that supports the Specific Plan and the Draft EIR does not assume a reduction in commute distances as a part of the impact analysis. While the Specific Plan is designed to provide air quality benefits by reducing the amount of commute-related VMT by Stanislaus County residents who would choose to work in the Specific Plan Area instead of more distant locations, it is not possible to quantify these benefits for the purposes of the transportation, energy, greenhouse gas emissions, or air quality analysis. Therefore, the analysis may overestimate the actual impact of the Specific Plan. However, the County has elected to keep the conservative analysis in the Draft EIR.

Response to Comment 6-43

Refer to Master Response 1, Response to Comment 6-33, and Response to Comment 6-42.

The Draft EIR assumes that no benefit to emissions or energy use would occur from the Specific Plan. For example, the analysis conservatively assumes that there would be no reduced transportation demands from the Specific Plan. Greenhouse gas emissions estimates are based upon modeled outputs from the California Emissions Estimator Model (CalEEMod). CalEEMod estimates use the inputs provided of proposed land use types and amounts contained in Chapter 2 of the Draft EIR, "Project Description," and the model contains data regarding average trip distance and trip type based upon the geographical area and land use types. The vehicle miles traveled (VMT) estimated by CalEEMod was used to calculate mobile-source related air pollutant emissions using the ARB on-road mobile source emission inventory model, EMFAC. Because some of the potential future land uses (e.g., distribution centers, light industrial) could involve vehicle fleets (i.e., heavy duty trucks for operations) that differ from the Stanislaus County average vehicle fleet, the analysis summarized in the Draft EIR adjusted the heavy-duty truck percentage of those land uses. CalEEMod suggests that for these types of uses, a higher percentage of heavy-duty trucks should be used for the vehicle fleet. Please refer to Section 3.7.3 (page 3.7-11 of the EIR) and Impact 3.7-1 (pages 3.7-16 through 3.7-22 of the EIR) of the EIR for the complete discussion of methodology and analysis used to quantify greenhouse gases.

While the Specific Plan is designed and located to create a regional employment center that will promote development and reduce greenhouse gas emissions by bringing jobs closer to the County residents (see Objective 2 of the Specific Plan), this is not used as the bases for the analysis of greenhouse gas emissions. However, the County has elected to keep the conservative analysis in the Draft EIR.

Response to Comment 6-44

Refer to Master Response 1, Response to Comment 6-33, Response to Comment 6-42, and Response to Comment 6-43.

Construction-related and operational emissions of greenhouse gases (GHGs) were assessed in accordance with methodologies recommended by ARB and SJVAPCD. Emissions were modeled for construction and operations of proposed land uses contained in Chapter 2, "Project Description," and vehicle trip generation data from the traffic study prepared to support the Draft EIR (TJKM 2018), as well as for all infrastructure needed to serve the Specific Plan at full buildout. The Draft EIR analysis considers different sources of operational emissions including area, energy, mobile, waste, water, transportation refrigeration units, high-global warming potential refrigerants, and aircraft activity emissions. Please see Section 3.7.3, *Methodology*, (pages 3.7-10 to 3.7-11) of the Greenhouse Gas Emissions chapter of the Draft EIR for more detailed information regarding modeling programs used and data sources that served as inputs to the modeling process. As explained in this section, the emissions estimating methodology is consistent with that described in Section 3.2, "Air Quality."

The thresholds of significance used to determine if the project's GHG emissions would have a significant impact on the environment are based upon SJVAPD guidance for assessing the impact of GHG emissions (SJVAPCD 2015, page 112). Ultimately, California's statewide GHG reduction targets are used by the County to establish the framework for GHG analysis in the Draft EIR, including what level of GHG emissions would be cumulatively considerable. A detailed discussion of the SJVAPCD GHG analysis requirements and the significance threshold used for impact determination are provided in Section 3.7.3, *Thresholds of Significance*, (pages 3.7-11 through 3.1-16) of the Draft EIR.

To maintain a more "conservative" analysis, the emissions estimates do not include existing emissions associated with on-site agricultural uses or the existing use of the site by the County Sheriff. The analysis presents emissions for the Specific Plan at buildout without subtracting out the existing emissions on-site that would discontinue with development of the Specific Plan Area. The results are "conservative," meaning the results would tend to overestimate the actual net change in emissions compared to existing conditions. However, the County has elected to keep the conservative analysis in the Draft EIR.

Response to Comment 6-45

Refer to Response to Comment 7-2.

Response to Comment 6-46

As stated on Draft EIR page 3.8-15 (Section 3.8, "Geology, Soils, Minerals, and Paleontological Resources"), the analysis related to geology and soils relied in part on information contained in the following report: "Preliminary Geotechnical Engineering Report and Geologic Investigation Hazard Report, West Park Project, Stanislaus County, California," which was prepared by the geotechnical engineering firm of Wallace Kuhl & Associates (Wallace Kuhl) in 2007. The results of this geotechnical study related to soils, seismicity, and other geologic hazards, such as unstable soils, are presented throughout Draft EIR Section 3.8 of the Draft EIR, "Geology, Soils, Minerals, and Paleontological Resources." Based on the results of the investigation, Wallace Kuhl & Associates reached the following conclusion: "It is our opinion, based on the review of available geological, soil, and geotechnical data, that the project site is suitable for the proposed construction from a geotechnical and engineering geological standpoint" (Wallace Kuhl 2007:12).

The Wallace Kuhl geotechnical report goes on to suggest site-specific measures that could be incorporated into future project designs to reduce the potential impacts from geologic hazards. For example, page 14 of the Wallace Kuhl (2007) report suggests alternatives that can be used to "…mitigate effects on highly compressible soils on the proposed foundations, including but not limited to: (1) ground modification such as over-excavation of the compressible soils and replacement with properly compacted engineered fill; (2) support the proposed structures on a deep foundation system, extending below zones with compressible soils; and, (3) reinforced shallow foundations capable to withstand significant total and differential settlements (grade beams, reinforced or post-tensioned slab or mat, rigid raft foundation)."

Page 15 of the Wallace Kuhl (2007) report addresses soil expansion potential, and states that:

> "Depending on the actual expansion potential of the on-site clays soils, several alternatives can be employed to mitigate the effects of expansive soils on concrete slab-on-grade and exterior flat work, including: (1) moisture-conditioning of the clay soils to above optimum moisture content; (2) removal and replacement of the clay soils beneath the slabs and exterior flatwork with nonexpansive engineered fill; and, (3) chemical amendment (lime-treatment) of the clay soils to amend the soils to low expansion potential materials."

See also additional site-specific geotechnical and engineering design specifications that would reduce effects from geologic hazards on page 15 (pavement subgrade and soil permeability), and page 16 (soil corrosion potential) of the Wallace Kuhl (2007) report.

Because Draft EIR Mitigation Measures 3.8-2a, 3.8-2b, and 3.8-2c contain specific, enforceable performance standards in compliance with the California Building Standards Code that would mitigate the significant effects of the project (CEQA Guidelines Section 15126.4[a][1][B]), and because the Wallace Kuhl 2007 geotechnical report determined that the Specific Plan Area is suitable for the proposed construction from a geotechnical and engineering geological standpoint, no changes to the impact analysis are warranted and no further studies are required.

Please also see Master Response 2.

For information regarding subsidence that could result from groundwater withdrawal, the commenter is directed to Pages 3-7, 5-2, and 5-3 of the Groundwater Resources Impact Assessment (GRIA) prepared to support the Draft EIR (included in Appendix B to the Final EIR), and to pages 3.8-19 and 3.8-20 of the Draft EIR. As discussed, the Delta-Mendota Groundwater Subbasin (DMGS), in which the Specific Plan Area is located, has been designated as being in a state of critical overdraft primarily due to subsidence south of Stanislaus County, and has been designated as a whole to have a high potential for future subsidence. However, very little subsidence has occurred within the County. The maximum amount of subsidence near the Specific Plan Area (1 to 2.5 inches) is reported by the Department of Water Resources to be recorded at Continuous Survey Station P259, located near the northeast corner of the Specific Plan area, at the intersection of Marshall Road and State Highway 33. The maximum predicted drawdown as a result of Specific Plan groundwater pumping is 3 to 13 feet southwest of the Specific Plan Area, near the Delta-Mendota Canal. Given the limited amount of drawdown that is predicted and that only 1 to 2.5 inches of subsidence has been reported near the Specific Plan Area as a result of historical drawdown to date, the likelihood that groundwater withdrawal for the Specific Plan will result in subsidence that substantially interferes with surface land uses and infrastructure is very small. Nevertheless, the Draft EIR identified Mitigation Measure 3.8-2c (page 3.8-20 of the Draft EIR), which requires subsidence monitoring in the vicinity of the Specific Plan area in coordination with the local Groundwater Sustainability Agency (GSA), and appropriate actions to prevent significant subsidence associated with the project based on the monitoring results.

Independent of the Specific Plan, Stanislaus County has a Groundwater Ordinance (Chapter 9.37 of the Stanislaus County Code) and associated well permitting program. Under the Groundwater Ordinance, permits to extract groundwater for the Specific Plan Area will be issued for terms that coincide with the adoption of a Groundwater Sustainability Plan (GSP) for the area, and every five years thereafter, coinciding with required updates to the GSP. Under the Groundwater Ordinance and the GSP, prevention of subsidence will be a precondition to renewal of the groundwater extraction permits for the project. In addition, Government Code Section 65352.5 requires consultation with the GSA as part of the environmental review process for site-specific approvals, and for the GSA to report on the anticipated effects of those approvals on implementation of the GSP.

Response to Comment 6-47

The Specific Plan Area is located approximately 1 mile east of Interstate 5 (I-5), and is south of the Patterson City limits. The proposed project includes improvements to the existing Fink Road/I-5 interchange, which will serve as the primary point of entry into the Specific Plan (Draft EIR Chapter 2, "Project Description," page 2-19). Material deliveries to and from the Specific Plan will use I-5 via Fink Road. Heavy-duty truck drivers carrying hazardous materials would exit I-5 six miles north of the Specific Plan Area, travel on surface streets through the city of Patterson at slow speeds through numerous traffic lights, then travel south through the city for approximately 6 miles on additional surface streets at very slow speeds and through numerous traffic lights, and finally access the Specific Plan Area from the north via West Marshall Road. While it is likely that future Specific Plan Area employees who reside in the city would travel on surface streets through the city from their homes during their daily commute, commercial truck drivers (including those hauling hazardous materials) would use the I-5/Fink Road interchange, which provides the fastest and most direct mode of access.

Furthermore, as discussed in Draft EIR Impact 3.9-1 in Section 3.9, "Hazards and Hazardous Materials" (pages 3.9-17 an 3.9-18), the transport, use, and storage of hazardous materials is heavily regulated at the federal, State, and local level. Some of the numerous regulatory controls over hazardous materials are presented in detail on Draft EIR pages 3.9-10 through 3.9-15.

The Stanislaus County Department of Environmental Resources (DER) is the lead local regulatory agency (i.e., Certified Unified Program Agency [CUPA]) and is responsible for a variety of tasks related to the storage, handling, and management of hazardous materials. The County DER performs the following functions (among others):

- prepares and implements the County's Hazardous Waste Management Plan;
- implements hazardous materials disclosure laws (business plan programs) to ensure public access to information about chemicals handled by businesses;
- reviews procedures for storage, treatment, and disposal of hazardous wastes;
- implements risk management and prevention laws to minimize chemical releases in the community;
- maintains a hazardous materials response team to assist police and fire agencies during transportation and industrial accidents involving chemical spills; and

- prepares and implements the county's Area Plan for emergency response to chemical spills in the community. [Stanislaus County DER 2018.]

Project-related heavy-duty truck traffic is unlikely to travel through the city; therefore, it is unlikely to result in ongoing changes to traffic patterns and other complications that could result in an accidental spill or exposure of hazardous materials in the city. Furthermore, the County DER is already responsible for preparing and implementing an Area Plan for emergency response to chemical spills (as requested by the commenter). Although the impact is less than significant, the County has identified the following mitigation measure to formalize the official route for trucking access to the Specific Plan Area.

Mitigation Measure 3.9-1: Designate Official Trucking Route.

The County shall designate the official trucking terminal access route for the Specific Plan from the Fink Road/Interstate 5 interchange directly to the Specific Plan Area. This trucking route shall apply to large trucks regulated by the Surface Transportation Assistance Act, referred to as STAA trucks.

Implementation: Leaseholders/developers/contractors.

Timing: Establish prior to construction and enforce during construction and operation of projects implemented within the Specific Plan Area.

Enforcement: Stanislaus County.

Please refer also to Chapter 3 of this Final EIR, which summarizes revisions to the Draft EIR.

Response to Comment 6-48

The Draft EIR analyzes each of the topics raised in this comment. The Draft EIR Section 3.9, "Hazards and Hazardous Materials," states that since 1987, numerous subsurface investigations were conducted to evaluate the extent of soil and groundwater contamination from previous activities at the former Crows Landing Flight Facility. These investigations determined that various areas of the project site contained contaminated soils. However, these sites have been fully remediated, and no further action is required. The only remaining area is the "Site 17 Administration Area Groundwater Plume (Parcel C)." Detailed information related to the Site 17 Administration Area contaminated groundwater plume is presented in Draft EIR Section 3.9, "Hazards and Hazardous Materials," on pages 3.9-5 and 3.9-6. Draft EIR Table 3.9-2 (page 3.9-5) lists the groundwater zones, depths below the ground surface, and the associated chemical constituents of concern in the groundwater plume. The California Department of Toxic Substances Control (DTSC) and the Central Valley Regional Water Quality Control Board (CVRWQCB) have the statutory and regulatory oversight for both cleanup activities and future land uses at the project site. As stated on Draft EIR page 3.9-5, in 2012, the Navy executed and published its *Final Record of Decision Site 17 Administration Area Groundwater Plume* (ROD), which evaluated and summarized several alternatives to remediate the contaminated groundwater. DTSC and CVRWQCB concurred with the selected alternative for remediation of groundwater, as described in the ROD. As further stated on Draft EIR page 3.9-6, land use controls (LUCs) have been, and will continue to be used to restrict on-site groundwater use. The LUCs were then recorded by DTSC and CVRWQCB in compliance with the ROD. The LUCs will remain in effect until the remedial goals for groundwater are achieved. The LUCs are enforced through the fully executed ROD (Navy 2012) and by the Central Valley RWQCB through the legally binding *Covenant to Restrict Use of Property-Water Use Restriction dated October 26, 2004, by and between the County and Central Valley RWQCB* ("Covenant"). As stated in the Covenant, the uses and activities described below are prohibited within the Restricted Area (i.e., a 2,000-foot pumping exclusion buffer zone around the contaminated groundwater plume, as shown on Exhibit A of the *Covenant to Restrict Use of Property-Water Use Restriction* and shown in Draft EIR Exhibit 3.9-1 [page 3.9-20]) without the express written permission of the Central Valley RWQCB[1]:

- Use of existing supply wells or the drilling of any new wells within the Restricted Area, except as expressly stated in the LUC;
- Construction of groundwater wells for injection or extraction and utilization or consumption of any groundwater within the boundary of the Restricted Area, except as expressly stated in the LUC;
- Any other activity on the Restricted Area that would interfere with or adversely affect any groundwater remediation system or cause the contaminated groundwater to migrate or spread from the Restricted Area or result in the creation of a groundwater recharge area (e.g., unlined surface impoundments or disposal trenches). Normal landscaping and irrigation activities within the Restricted Area, including routine irrigation practices, are not prohibited activities.
- The use of groundwater within the Restricted Area is prohibited for 8 years following the execution of the ROD [Record of Decision], i.e., until approximately 2024 (which is the length of time anticipated to achieve the remediation goals) (Draft EIR, page 3.9-6).

The ROD also states that after the remediation system is operating as intended, 5-year reviews (Interim Remedial Action Completion Reports) will be prepared and submitted to stakeholders. These reports will document the groundwater remediation activities, including waste characterization and laboratory analyses (Draft EIR page 3.9-6). Therefore, DTSC and CVRWQCB have determined that the 2,000-foot buffer zone around the groundwater plume is sufficient to protect adjacent groundwater resources.

Draft EIR Impact 3.9-2 (pages 3.9-18 through 3.9-2) evaluates the project's potential effects on the contaminated groundwater plume. In addition to the LUCs that prohibit on-site pumping of groundwater within the 2,000-foot Restricted Area as discussed above, Impact 3.9-2 (page 3.9-21) also states that, as discussed in the ROD (Navy 2012), which was prepared in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300, *et seq.*), the actions being taken at the project site to remediate contaminated groundwater meet the statutory requirements of Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and, therefore, as determined by DTSC and CVRWQCB, will achieve adequate protection of human health and the environment, comply with Applicable or Relevant and Appropriate Requirements (ARARs) of both federal and state laws and regulations, be cost effective, and use, to the maximum extent practicable, permanent solutions and alternative treatment or resource recovery technologies.

Therefore, as stated on Draft EIR page 3.9-22, because the legally binding LUCs will continue to be used to restrict on-site groundwater use, including a 2,000-foot pumping exclusion buffer zone around the contaminated groundwater plume, and with implementation of the required Interim Remedial Action Completion Reports that

[1] The following activities are not prohibited, however: (i) the use of on-site water supply well #6/8-17R(NASA) when used for emergency or fire suppression purposes only, (ii) uses of groundwater to which the CVRWQCB concurs, and (iii) uses of groundwater after the LUCs are terminated.

will document groundwater remediation (including any potential interaction between proposed groundwater pumping outside the 2,000-foot buffer zone and plume remediation) and will be prepared and submitted to DTSC and CVRWQCB for review every 5 years, the impact is considered less than significant. The Draft EIR contains an appropriate analysis of this potential impact and is based on substantial evidence including facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Guidelines Section 15384). No change to the Draft EIR is required.

Response to Comment 6-49

The comment states the proposed increase in groundwater demand by the project "absorbs all of the total available water supply in the aquifer;" however, in fact, the "total available supply in the aquifer" has not been established for the Delta-Mendota Groundwater Subbasin (DMGS) or the vicinity of the Specific Plan Area. Moreover, CEQA does not require an analysis of the total available supply, only a determination that a sufficient supply exists, and an evaluation of the potential environmental impacts that are associated with using that water supply.

Based on the CEQA Guidelines, Appendix G, the Specific Plan would result in a significant impact related to groundwater if it would

- "[S]ubstantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a substantial lowering of the level of the local groundwater table."

SGMA is much more specific in its terminology, and defines the sustainable yield of the aquifer as "[t]he maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result."

The sustainable yield defined by SGMA would be equivalent to the "total available water supply in the aquifer" cited by the commenter. To that end, both the SGMA and the Stanislaus County Groundwater Ordinance define undesirable results, as the following:

a. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

b. Significant and unreasonable reduction of groundwater storage.

c. Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.

d. Significant and unreasonable land subsidence that substantially interferes with surface land uses.

e. Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

These undesirable results are aligned with several checklist questions contained in Appendix G to the CEQA Guidelines, including the question quoted above. An evaluation of the potential impacts of developing the water supply for the Specific Plan compared to these checklist questions and undesirable results as defined in SGMA was presented on Pages 5-1 to 5-7 of the Groundwater Resources Impact Assessment that was prepared to support the Draft EIR. This assessment concluded that no undesirable results as defined by SGMA or significant impacts under the Appendix G checklist questions would occur. A sufficient water supply exists for the Specific Plan, even if the sustainable yield for the basin or aquifer as a whole or in the vicinity of the Specific Plan Area have not yet been established.

As stated in the Hydrology and Water Quality section of Draft EIR (page 3.10-43) and the Groundwater Resources Impact Assessment (page 5-3; JJ&A, 2016):

> "The worst case predicted Project-induced drawdown in the confined aquifer at full build-out is approximately 13 feet. This is less than 10 percent of the available drawdown above the top of the confined aquifer and is unlikely to result in a significant depletion in regional supplies."

See Appendix B to this Final EIR, which is the Groundwater Impact Assessment.

In addition:

> "[a] drawdown of less than 20 feet would not be expected to result in a significant diminution in the yield in a production well, as it typically represents less than 10 percent of the available drawdown. Drawdown in the shallow aquifer from pumping in the confined aquifer is expected to be negligible. The Project will not result in any net increase in groundwater demand from the shallow aquifer; however, if shallow Project wells located near the Site boundary are pumped excessively, nearby existing off-site domestic wells could experience drawdown in excess of 5 feet, which could potentially result in a significant diminution in yield in a very shallow well."

The Draft EIR identifies Mitigation Measure 3.10-4a to place new shallow wells at least 250 feet from the nearest Specific Plan Area boundary. In addition, to prevent potential adverse effects to domestic wells, Mitigation Measure 3.10-4b is proposed to implement a groundwater level monitoring program and curtail pumping of nearby Specific Plan Area wells if drawdown in excess of 5 feet is observed near an existing off-site domestic well. Mitigation Measure 3.10-4b also requires the County to coordinate with the Groundwater Sustainability Agency to prepare on groundwater monitoring conducted as a part of implementation of the Groundwater Sustainability Plan for the vicinity of the Specific Plan Area. Groundwater level monitoring activities, findings, and reporting schedule will also be defined in the Groundwater Sustainability Plan, along with the Minimum Thresholds and Measurable Objectives required in a Groundwater Sustainability Plan that govern when investigation and intervention is required and what adjustments to well field operation or other actions are required to avoid effects to existing off-site wells. With these measures in place, impacts will be less than significant and undesirable results as defined in SGMA will not occur as a result of pumping.

The Groundwater Resources Impact Assessment and the Draft EIR indicate that an operational yield study by the City of Patterson estimated that the City could pump up to 12,000 AFY without significantly impacting the use of groundwater resources in the area surrounding Patterson's sphere of influence (RMC 2016), and that the City of Newman pumped approximately 4,200 acre-feet of water in 2012 (KDSA 2013). As stated in the Groundwater Resources Impact Assessment, a study of groundwater level trends from 1993 to 2008 found that groundwater levels in northern portions of the Delta-Mendota Groundwater Subbasin were generally hydrologically balanced (AECOM 2016). The study found minimal net change in groundwater elevations, which indicates that there is an overall equilibrium between groundwater discharge (including pumping) and recharge in this region.

Water levels near the Specific Plan Area have overall been stable over the period of record (since 2011), which indicates recent pumping rates near the Specific Plan Area have been sustainable on an annual basis, even during the drought (JJ&A 2016: 3-4). A review of several hydrographs in the DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) for wells located near the Specific Plan Area indicates that groundwater levels, while still variable, have shown an overall increasing trend after the recent drought through the present. Based on the above information, undesirable results as defined in SGMA are not occurring or anticipated in this area. (Draft EIR pages 5-16 and 5-17). Based on the information discussed above, there is not a deficiency in the water supply of the aquifer, and mitigation measures were identified in the Draft EIR to protect shallow domestic wells from the worst case predicted in the drawdown analysis. Significant impacts as defined in CEQA and undesirable results as defined in SGMA are not reasonably anticipated.

See also the Response to Comment 6-65.

Response to Comment 6-50

As stated on page 3.10-45 in Section 3.10, "Hydrology and Water Quality," of the Draft EIR and discussed in Response to Comment 6-49, there are adequate groundwater supplies in both the shallow and confined aquifers available beneath the Specific Plan Area to serve the Specific Plan without contributing to undesirable results as defined by SGMA, the Stanislaus County Groundwater Ordinance, or the California Water Code.

SGMA requires that local Groundwater Sustainability Agencies be formed and develop a Groundwater Sustainability Plan to regulate sustainable groundwater management. Groundwater Sustainability Agencies will have 20 years to fully implement Groundwater Sustainability Plans after the plans have been adopted. The "DM-II" Groundwater Sustainability Agencies (GSAs) includes the Specific Plan Area and will implement a Groundwater Sustainability Plan that is currently being developed for the area collaboratively with several other GSAs by the Northern Delta-Mendota Management Committee and the Central Delta-Mendota Management Committee.[2] The Groundwater Sustainability Plan is required to be completed by 2020 and to be fully implemented by 2042, before full buildout of the Specific Plan. This Groundwater Sustainability Plan will be used to manage groundwater in the Delta-Mendota Groundwater Subbasin. There is no need to develop another plan to manage groundwater for the Specific Plan Area.

As stated in Response to Comment 6-49, the Groundwater Resources Impact Assessment prepared as part of the analysis in the Draft EIR (included as Appendix B to the Final EIR) considered implementation of the Specific Plan and evaluated whether it will lead to undesirable results as defined by SGMA (which will be addressed in the future Groundwater Sustainability Plan), or to potentially significant impacts related to the applicable checklist questions in Appendix G of the CEQA Guidelines. As explained on page 3.10-43 in Section 3.10, "Hydrology and Water Quality," of the Draft EIR, Specific Plan-related groundwater pumping will not result in significant impacts or cause undesirable results; therefore, the water supply to serve the Specific Plan Area is considered adequate and there are no current or reasonably foreseeable future requirements that would restrict its use of groundwater.

2 "DM-II" is the name of the Delta-Mendota Subbasin Groundwater Sustainability Agency that includes the Specific Plan Area, and includes Del Puerto Water District and Oak Flat Water District.

As stated on page 3.10-46 of the Draft EIR, under the Stanislaus County Groundwater Ordinance, prior to issuing a permit to construct a new groundwater supply well, the County must review information and make a determination whether it constitutes substantial evidence that the proposed groundwater extraction will not cause or contribute to one or more of the above undesirable results. The *Groundwater Resources Impact Assessment* is substantial evidence demonstrating that the Specific Plan will comply with the sustainable groundwater management requirements in the Stanislaus County Groundwater Ordinance. The Assessment is Appendix B to this Final EIR.

Nevertheless, because specific future requirements imposed through implementation of SGMA and the Groundwater Sustainability Plan cannot be completely guaranteed at this time, the Stanislaus County Groundwater Ordinance requires that groundwater extraction permits must be renewed when a Groundwater Sustainability Plan is adopted, and every five years thereafter, when the GSP is required under SGMA to be updated. Under the Groundwater Ordinance and the Groundwater Sustainability Plan, prevention of undesirable results will be a precondition to renewal of the groundwater extraction permits for the Specific Plan Area. In addition, Government Code Section 65352.5 requires consultation with the Groundwater Sustainability Agency as part of the environmental review process for site-specific approvals, and for the Groundwater Sustainability Agency to report on the anticipated effects of those approvals on implementation of the Groundwater Sustainability Plan.

Based on the above information, there is no reasonable expectation that the groundwater supply for the Specific Plan area will become unavailable, and existing plans, policies, and procedures exist to ensure compliance with SGMA.

Please also refer to Responses to Comments 14-5, 6-49, and 6-61.

Response to Comment 6-51

The exact height of the levee along Davis Road must be determined in the future at the time when site-specific development proposals are brought forward, and following a review by the California Department of Water Resources (DWR) Division of Safety of Dams (DSOD). As discussed in Draft EIR Impact 3.10-6 (pages 3.10-53 and 3.10-54), DSOD must make a determination as to whether or not the Davis Road levee will fall within its jurisdiction. If so, then the levee design will be subject to DSOD criteria. If not, then the levee design will fall under the jurisdiction of DWR's Urban Levee Design Criteria (ULDC). It is not possible at this time for the EIR to specify the exact site-specific design details, such as the height of the levee road, crown width, or side slopes. Mitigation Measure 3.10-6 (DEIR pages 3.10-53 and 3.10-54) requires preparation of a site-specific levee design report and incorporation of "appropriate design and engineering recommendations" such as "those contained in USACE Engineering Manual 1110-2-1913 *Design and Construction of Levees* (USACE 2000), Engineering Technical Letter (ETL) 1110-2-569, *Design Guidance for Levee Underseepage* (USACE 2005), and ETL 1110-2-555, *Design Guidance on Levees* (USACE 1997)." These manuals and ETLs are industry-standard publications that guide the design and construction of levees in California.

DSOD and ULDC levee criteria have been designed to provide protection from the 100-year (0.01 annual exceedance probability [AEP]) storm event. Mitigation Measure 3.10-6 (Draft EIR pages 3.10-53 and 3.10-54) requires preparation of a site-specific levee design report and incorporation of design and engineering recommendations that are appropriate depending on the type of levee, the division of DWR that will have regulatory oversight of the levee, and the design and construction parameters needed to comply with DSOD and

ULDC criteria. Therefore, Mitigation Measure 3.10-6 contains specific, enforceable performance standards that would mitigate the significant effects of the project (CEQA Guidelines Section 15126.4[a][1][B]); thus, the less-than-significant impact conclusion after implementation of mitigation (for Draft EIR Impact 3.10-6) is appropriate.

See also Master Response Master Response 2.

Response to Comment 6-52

Mitigation Measure 3.12-4 requires additional actions that would further reduce impacts beyond what is required by the County's Noise Ordinance. With implementation of Mitigation Measure 3.12-4, construction activities would be limited to daytime hours (would not take place between 7 p.m. and 7 a.m.) and would not be allowed on weekends and holidays. Construction equipment would be properly maintained and equipped with noise control components, such as mufflers, in accordance with manufacturers' specifications. As concluded on page 3.12-37 of the Draft EIR, there is no additional feasible mitigation to avoid, or reduce this impact to a less-than-significant level. As a result, this impact would remain significant and unavoidable.

Response to Comment 6-53

Section 3.12, "Noise and Vibration," of the Draft EIR included an analysis of aircraft noise exposure, which identified the geographic area that would be subject to aircraft noise at levels exceeding regulatory thresholds at airport opening and during its first 30 years of operation. The Draft EIR assumed all aircraft operations ceased at the Naval Auxiliary Airfield with site closure and there is no existing aircraft noise (page 3.12-11 of the Draft EIR). Existing baseline conditions assume no airport, as explained on pages 3.12-7 through 3.12-12 of the Draft EIR.

As discussed on page 3.12-26 in Section 3.12 of the Draft EIR, the operational forecasts and likely fleet mix were considered to identify aircraft noise exposure. Other factors considered in the analysis of aircraft noise exposure included:

- Distribution of aircraft operations by time of day for each aircraft type
- Amount of noise transmitted by operations by time of day for each aircraft type
- Average takeoff profile, and standard slope used by each aircraft type
- Amount of noise transmitted by each aircraft type measured at various distances from the aircraft.
- Runway configuration and length
- Runway utilization distribution by aircraft type and time of day
- Geometry of common aircraft flight tracks
- Distribution of operations for each flight track.

Using this data and FAA's Integrated Noise Model, noise contours were generated to identify areas that would be affected by aircraft noise. Operational forecasts were developed as part of the ALP to identify potential aircraft noise exposure, as measured using the Community Noise Equivalent Level (CNEL). The results of the CNEL calculations were depicted by a series of points representing points of equal noise exposure in 5dB increments from 50dB to 65dB CNEL (see Exhibit 3.12-6 of the Draft EIR).

The proposed project would include an ALUCP amendment to address airport-specific policies for the new Crows Landing Airport and planned airport development, as identified in the ALP. The ALUCP amendment would provide a new airport noise policy map that reflects the anticipated aircraft noise contours shown in Exhibit 3.12-7 in Section 3.12 of the Draft EIR and a revised Airport Influence Area to which all county-wide ALUCP policies will apply.

As stated in Impact 3.12-5, the Specific Plan can accommodate a variety of land uses that would occur outside of the 55 CNEL noise exposure contour. None of CLIBP site or off-site areas within the current ALUCP planning boundaries would be exposed to aircraft noise at unacceptable levels, and all proposed uses would be normally compatible with applicable noise policies. At full buildout, the 55 CNEL contour would extend off-site to adjacent agricultural land. Agricultural land, with the exception of new residences and grazing land, would be consistent with the county-wide ALUCP noise policies. The city of Patterson is located outside of the 55 CNEL noise contour, as shown in Exhibits 3.12-6 and 3.12-7 of Section 3.12.

Response to Comment 6-54

The Specific Plan does not propose a rail terminal, spur or other infrastructure/connection to the off-site rail line on the east side of State Route 33. Although previous project designs, prior to development of the Specific Plan, had considered a potential connection, that idea was eliminated based on a desire to provide a project footprint that remained within the boundaries of the former military site and the extent of additional infrastructure that would be required to extend the track from the east side of State Route 33 to the project site, provide loading and roll-off facilities, etc. The proposed Specific Plan does not include facilities to provide a connection to the adjacent rail line. Truck/rail intermodal facilities are available along Interstate 5 (Lathrop).

Response to Comment 6-55

Baseline conditions as documented to support the Draft EIR are representative of the existing environment that would be affected by the implementation of the Specific Plan. The Notice of Preparation for the EIR was released in October of 2014. See CEQA Guidelines Section 15125(a) (the environmental setting at the time the NOP is published will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant). No updates to noise modeling or noise impacts in the Draft EIR are required.

Please also see Response to Comment 6-54.

Response to Comment 6-56

Based on Appendix G of the CEQA Guidelines, an impact related to public services is considered significant if a proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives. Changes in service ratios, response time, and performance objectives or costs to provide services are not physical environmental impacts on the environment. Nonetheless, as discussed in Section 3.13, “Public Services,” of the Draft EIR, a detailed discussion of impacts on fire and police protection is provided. Implementation of State and local regulations, including General Plan policies and implementation measures, ensure adequate levels of service are provided to residents and businesses throughout the County, including the Specific Plan Area.

Impact 3.13-1 concludes that incorporation of all California Fire Code, County Fire Protection District, and West Stanislaus Fire District requirements into the designs of project buildings would reduce the dependence on fire department equipment and personnel by reducing fire hazards. In addition, Impact 3.13-1 states that the project would be required to pay its fair share of the costs of fire protection services and facilities through payment of the County's development impact fees; therefore, services and personnel would be available to serve the proposed project. Because the project would be required to pay its fair share of the costs of fire protection services and facilities through payment of the County's development impact fees, the analysis of Impact 3.13-2 concludes that sufficient police protection services and personnel would be available to serve the proposed project. As discussed in further detail in Section 3.13, the Specific Plan would not affect fire protection or police protection service ratios, response times, and other performance objectives. While fire and police assistance from the City may occasionally be required, this assistance would not substantially affect the level of service for the City's fire and police providers.

Approximately 15 acres in the southernmost portion of the Public Facilities area located west of the intersection of Ike Crow Road and Bell Road have been designated as an appropriate location for the development of on-site fire and law enforcement facilities (Phase 1). Physical impacts associated with construction and operation of fire and law enforcement facilities are evaluated in the other sections of the Draft EIR. There are no additional significant impacts associated with construction of on-site facilities beyond those comprehensively considered throughout the other sections of the Draft EIR.

Please see Response to 12-5 for further discussion of traffic accidents and public safety. Please also see Master Response 1.

Response to Comment 6-57

Please see Master Response 1 and Responses to Comments 6-61, 6-64, 13-5, and 13-6.

Response to Comment 6-58

Each alternative was evaluated according to the "rule of reason" and general feasibility criteria suggested by the CEQA Guidelines Section 15126.6, as follows:

> The range of alternatives required in an EIR is governed by a 'rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

The County has considered a range of alternatives that could feasibly attain most of the basic project objectives and avoid or substantially lessen one or more significant effects. Alternatives were selected for evaluation in the Draft EIR based on criteria in the CEQA Guidelines Section 15126.6, which are summarized above. These criteria are:

- Ability of the alternative to attain most of the basic project objectives;

- Feasibility of the alternative; and
- Ability of the alternative to avoid or substantially reduce one or more significant environmental effects of the proposed project.

The County's primary goal in proposing the Crows Landing Industrial Business Park (CLIBP) is to reuse the former military property to create a regional employment center that would provide its residents and those living in nearby Central Valley communities with opportunities to obtain sustainable-wage jobs that do not require long commute distances (as also reflected in the Project Objectives listed starting on page 2-3, subsection 2.3 of the Draft EIR). Development of the project site with employment-generating uses is supportive of the County's General Plan and the Comprehensive Economic Development Strategy, the focus of which is to begin to overcome the dramatic disparity between employment rates in Stanislaus County and state and national rates (Stanislaus County Economic Development Action Committee 2017).[3] As explained in this Economic Development Strategy:[4]

> Stanislaus County suffers from continuously high unemployment. Between 2010 and 2016, local job growth remained challenged with a slight 5.4% population increase. Payroll job creation has languished even as the population expanded. American Community Survey data averaged for the two years of 2015 and 2016 puts the Stanislaus unemployment rate at 8.7% of the labor force, compared to 4.65% for the nation as a whole. Current preliminary unemployment for December 2016 remains at 8.3% while California and total U.S. are at 5.0% and 4.5% respectively. Rankings produced by the State of California's Employment Development Department show Stanislaus County's unemployment rate as recently ranking 37th out of 46 regions in California. (Stanislaus County Stanislaus County Economic Development Action Committee 2017, page 4).

The Economic Development Strategy is Appendix E to this Final EIR.

This focus on employment development is important for the location and design of the proposed project, as is the County's flexible approach to land use that is intended to facilitate a range of development and end users. Specific objectives of the Specific Plan are provided on page 4-2 in Chapter 4, "Alternatives," of the Draft EIR.

The proposed Specific Plan would provide for a mix of allowable uses that, while consistent with general aviation, would also provide flexibility for variety of uses to promote economic development and local job creation. While the County acknowledges the NOP comment that site be designated as a multi-activity entertainment center including vehicle racing, it did not consider this as feasible alternative because such a use would require a large portion of, or the entire 1,528-acre site and therefore would not meet the basic project objectives. While an entertainment complex could provide additional jobs to County residents, it could not do so to the extent that it would fulfill the County's goal of creating a regional job center and this alternative would not substantially avoid or reduce any environmental impacts compared to the proposed project.

Please also see Response to Comment 6-62.

---

3 For more detail, please see the County's Comprehensive Economic Development Strategy, available online at: http://www.stancounty.com/ceo/econ-dev/pdf/ceds.pdf.

4 For more detail, please see the County's Comprehensive Economic Development Strategy, available online at: http://www.stancounty.com/ceo/econ-dev/pdf/ceds.pdf.

Response to Comment 6-59

Alternative 2 would reduce the scale of the Specific Plan and, consequently, wastewater demand requiring treatment at the City's WQCF. Table 4-5 in Chapter 4, "Alternatives," of the Draft EIR has been revised accordingly (see revisions provided below). The commenter does not provide facts or evidence to support the statement that reducing the project size would subsequently reduce the need for some expansion of the City's WQCF. As stated in Section 3.15, "Utilities and Service Systems," of the Draft EIR, the City has prepared improvement plans for WQCF expansion to achieve a design capacity of 3.5 mgd. The City's Wastewater Master Plan examines alternatives to expansion of the WQCF to handle 7.0 mgd to service future, planned development. As stated on page 3.15-3 in Section 3.15, "Utilities and Service Systems," of the Draft EIR, additional WQCF expansion to 7.0 mgd will be required to treat wastewater flows at buildout of the city of Patterson and Diablo Grande. Therefore, a reduced Specific Plan scale would not reduce the amount of wastewater flow such that an expansion of the WQCF would not be required. Therefore, no additional analysis is required.

Please see also Chapter 3 of this Final EIR, "Errata." This edit does not change the analysis or conclusions of the Draft EIR.

Table 4-5
Comparison of Infrastructure Improvements Needed

Type	Alternative 2	Proposed Project
Dry Utilities (Electricity, Natural Gas, Communications)	Utility service would be provided by Pacific Gas & Electric Company (PG&E) (natural gas), Turlock Irrigation District (TID, electric) and AT&T (communications). Utilities would be located in joint trenches along the western or southern sides of on-site roadways.	Same as Alternative 2.
Sewer	Alternative 2 would require the construction of gravity trunk mains, a 2.66-Million Gallons per Day (MGD) sanitary sewer lift station southwest of the Marshall Road and State Route 33 intersection, a ~~0.065~~0.32-MGD sanitary lift station south of the airfield near the Delta Mendota Canal, and a force main within Marshall Road to convey effluent to the existing Western Hills Water District (WHWD) trunk main in Ward Avenue. Less development under Alternative 2 would generate less wastewater as compared to the proposed project.	Same as Alternative 2, plus the construction of a force main to convey sewage from the site to the City of Patterson wastewater treatment facility.
Storm Drainage	To accommodate flows on Little Salado Creek, an existing channel south of the airport would be improved. The existing box culverts would be replaced by three 4-by-8-foot box culverts to convey flows beneath the runway.	Same as Alternative 2, plus the creation of a detention basin in the northeast corner of the project site to detain flows.
Water	On-site groundwater wells and wellhead treatment would fulfill site demand. Under Alternative 2, existing on-site groundwater wells would be developed with a wellhead treatment system to provide water to the Fink Road Corridor, Bell Road Corridor, airport, and 15 acres of the Public Facilities area. Infrastructure development would include distribution pipes and valves, the construction of a water storage tank east of the intersection of Davis and Fink roads, and a well booster pump station. As with the proposed project, Alternative 2 could potentially connect with the City of Patterson water system or the Crows Landing Community Services District for blending or redundancy, but not for water supply.	Same as Alternative 2, plus additional infrastructure (pipes, valves, a water tank, and pump station). The project could potentially connect with the City of Patterson water system or the Crows Landing Community Services District for blending or redundancy, but not for water supply.
Roadways	See above under the heading "Traffic and Transportation."	See above under the

Table 4-5 Comparison of Infrastructure Improvements Needed		
Type	Alternative 2	Proposed Project
		heading "Traffic and Transportation."

Response to Comment 6-60

Please see Responses to Comments 6-58 and 6-62.

Response to Comment 6-61

See Response to Comment 6-28 and Master Responses 1 and 2.

Draft EIR Table 2-1 (page 2-12) lists each type of projected land use at the project site, along with a brief description of what that land use would entail, and then specifies the acreage at the project site that would be devoted to each land use. The land uses are described on Draft EIR pages 2-12, 2-15, and 2-15, and are shown graphically in Exhibit 2-5 (page 2-13). As stated on Draft EIR page 2-11, "[T]hese land uses would be developed in three 10-year phases to provide the opportunity for approximately 14,000 to 15,000 jobs at full buildout." Therefore, the Draft EIR has clearly identified and described the types of land uses that would occur, the locations where such land uses would occur, and has stated the number of expected new jobs.

For a more comprehensive explanation of the potential effects associated with long-term groundwater pumping the commenter is referred to Responses to Comments 6-49 and 6-50. The specific evaluations required to issue permits for construction and operation of groundwater supply wells are detailed in the Draft EIR and in the Groundwater Resources Impact Assessment (JJ&A 2016:2-4). Nevertheless, under the Groundwater Ordinance, permits to extract groundwater for the project will be issued for terms that coincide with the adoption of a Groundwater Sustainability Plan, and every five years thereafter, coinciding with required updates to the Groundwater Sustainability Plan. Under the Groundwater Ordinance and the Groundwater Sustainability Plan, prevention of undesirable results will be a precondition to renewal of the groundwater extraction permits for the Specific Plan Area.

As detailed on pages 1-2 and 1-3, the Specific Plan and EIR anticipate the effects of subsequent projects proposed within the Specific Plan Area, as well as infrastructure improvements needed to support future development with the Specific Plan Area. Future projects that are consistent with the Specific Plan would either require no further environmental analysis or focused environmental analysis. The County will evaluate proposed projects to determine whether additional CEQA analysis will be necessary. This EIR will be used for the tiering of later project-specific reviews. In examining the appropriate approach to providing CEQA analysis for subsequent project approvals, the County will assess, among other things, whether the significant environmental impacts identified in this EIR have been adequately addressed. Therefore, new or additional analyses performed for subsequent site-specific actions would focus on impacts that cannot be "avoided or mitigated" through policies, design guidelines, and development standards adopted as a part of the Specific Plan or mitigation measures identified in this EIR.

Future environmental review can also be streamlined pursuant to Public Resources Code Section 21083.3 and the *CEQA Guidelines*, Section 15183. The provisions of the Public Resources Code are similar, but not identical to the previously described tiering provisions. Public Resources Code Section 21083.3 limits the scope of environmental review for site-specific approvals following the preparation of an EIR for a zoning action, community plan, or General Plan (including the Specific Plan). For later site-specific approvals, CEQA review is only required for impacts that are "peculiar to the parcel or to the project" and have not been previously disclosed, except where "substantial new information" shows that previously identified impacts would be more significant than previously assumed.

Response to Comment 6-62

Stanislaus County has pursued development at the former Crows Landing Air Facility since the late 1990s, when it convened a task force to investigate site reuse and the development of a general aviation airport. The County acceptance of the property in 2004 for the sole purpose of economic development and job creation through the development of a general aviation airport and other appropriate, aviation-compatible land uses. The City's allegation that the project description is overly narrow and limited does not take into account the County's long-term efforts to identify the highest and best use of the former military property since conveyance, the types of land uses most appropriate for the site based on its location, the historically high employment rates in Stanislaus County, and identified economic development trends.

The County's project description was based on several important considerations and milestones summarized below:

- **2000:** The County convened a Crows Landing Steering Committee to identify potential reuse opportunities for the former Crows Landing Naval Facility, which had been decommissioned by the Base Closure and Realignment (BRAC) Commission.

- **2001:** The Board of Supervisors adopted a reuse plan prepared by the Crows Landing Steering committee that recommended the development of a general aviation facility to help offset the County's persistent jobs-to-housing imbalance.

- **2004:** The Board of Supervisors accepted conveyance of 1,352 acres of the 1,528-acre former of the military pursuant to Public Law 106-82 for the purpose of economic development.

- **2005:** The County identified a vision for site development that would "Create a regional job center that provides good-paying job opportunities for Stanislaus County residents and for the region" (Stanislaus County Board of Supervisors 2005).[5] Since that time, one of the County's chief priorities has been to create employment for the local work force through local economic growth and the attraction of new industries to the community (Stanislaus County Board of Supervisors 2006).[6]

- **2006:** The County hired an aviation consultant to conduct outreach and consider three potential reuse scenarios for the former Crows Landing site. The consultant recommended that the county retain only the crosswind runway for potential GA development. Retaining the primary runway or both runways would not provide sufficient land for the development of aviation-compatible uses in accordance with the County's

5 Stanislaus County, 2005. Crows Landing Air Facility: A Redevelopment Option. Modesto CA.

6 Stanislaus County, 2006a. Crows Landing Air Facility and Industrial Business Park: Master Development Plan Concept Review. August 2006. Modesto, California. Stanislaus County, 2006b. The Board of Supervisors of the County of Stanislaus Action Agenda Summary, Board Agenda No. B-8, September 26, 2006. Modesto CA.

vision for site reuse and the guiding principles established by its steering committee, among them to protect the airfield from encroachment while capitalizing on the site's proximity to Interstate-5.

Following the economic downturn of 2008, the County re-invigorated its site development efforts by serving as a Master Developer: it began to identify infrastructure needs and initiated environmental studies to support CEQA compliance and entitlement. In doing so, the County considered the lessons learned while working with a private developer from 2006 through 2012, who had proposed the acquisition of additional agricultural property to the west and the development of an inland port with an on-site rail spur. When proposing the Crows Landing Industrial Business Park, the County reconfigured site development to reflect recent economic trends and public comments, which supported reuse of the former Crows Landing site but did not support the acquisition of additional off-site property or the development of an inland port. The project description for subsequent CEQA efforts was revised to exclude the use of rail and focus on the types of development that were most likely to be successful, compatible with a general aviation airport, and benefit from proximity to I-5.

The proposed Specific Plan for the Crows Landing industrial business park does not represent a narrow use, but a reasonable alternative that would provide for a suite of allowable uses that, while consistent with general aviation, provides flexibility for variety of uses to promote economic development and local job creation.

Response to Comment 6-63

Please see Responses to Comment 6-58 and Comment 6-62.

Response to Comment 6-64

CEQA Guidelines Section 15130(b)(1), identifies two approaches to analyzing cumulative impacts: the first approach is the "list approach," in which a list of past, present, and probable future projects producing related or cumulative impacts is considered for analysis and the second approach is the "summary of projections "approach (also known as the "plan" approach), whereby projections contained in adopted local, regional or statewide plans, or planning documents that evaluate conditions which could contribute to cumulative effects are summarized. As stated in Chapter 5, Other CEQA," the Draft EIR, the plan approach is used to assess the changes due to the proposed project, in combination with past, present and probable future projects, in this EIR that could contribute to potential cumulative effects.

The cumulative impact analysis presented in Section 5.1, "Cumulative Impacts," in Chapter 5, "Other CEQA," of the Draft EIR incorporates the *Stanislaus County 2014 Regional Transportation Plan/Sustainable Communities Strategy* (2014 RTP/SCS), which includes the City of Patterson's projected growth, by reference. StanCOG prepared an EIR to analyze the impacts of regional land use change assumed under the RTP/SCS (State Clearinghouse Number 2013012012) (StanCOG 2014). The 2014 RTP/SCS assumes land use changes and increases in population, housing and employment for unincorporated Stanislaus County, as well as development in the cities of Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock, and Waterford through 2040.

Section 5.1, "Cumulative Impacts," in Chapter 5, "Other CEQA," of the Draft EIR describes the traffic and transportation Cumulative plus Project Conditions scenario. The City of Patterson requested that additional roadway segments in or near the City be evaluated under 2035 conditions. These are described on page 5-36 of the Draft EIR.

The Tri-County Traffic Model for travel demand forecasts was used in the analysis. The model geographically covers the counties of San Joaquin, Stanislaus, and Merced. It was developed by the San Joaquin Council of Governments (SJCOG) and recalibrated so that it closely replicated the existing conditions. In addition, three new traffic analysis zones (TAZs) were developed for the project area, and loaded with the ITE trip generation into the model for trip distribution and assignment. The model integrates the network and land use information from the StanCOG model, the SJCOG travel demand forecasting model, and the Merced County Association of Governments (MCAG) travel demand forecasting model. The combined model provides good coverage of the study area, extending from Tracy-Stockton to the north to Los Banos to the south including the Patterson area. The model was used to forecast A.M. and P.M. peak-hour and daily trips. Therefore, this methodology provides a comprehensive forecast for the analysis of Cumulative plus Project Conditions.

Future development in the Stanislaus County would increase demand for public services and recreation. In terms of cumulative impacts, appropriate service providers are responsible for ensuring adequate provision of public services within their service boundaries. Please also see Response to Comment 6-56.

The commenter is referred to the water demand information presented on Page 3-6 of the Groundwater Resources Impact Assessment, the impact analysis on Pages 5-1 to 5-5 of the Groundwater Resources Impact Assessment and the Responses to Comments 6-49 and 6-50 above, as these responses discuss the current and reasonably foreseeable water demand in the Specific Plan Area, the adequacy of the groundwater supply for the Specific Plan Area, and related impacts. The impact analysis considered future groundwater extractions by the cities of Patterson, Newman, and community of Crows Landing in combination with groundwater demand of 2,819 AFY associated with the implementation of the Specific Plan at buildout. The potential offsetting effect of agricultural land conversion to urban use was also considered. As discussed previously, the worst-case predicted Specific Plan-induced drawdown in the confined aquifer at full build-out in 2046 is approximately 13 feet. This is less than 10 percent of the available drawdown above the top of the confined aquifer and is unlikely to result in a significant depletion in regional supplies or other undesirable results. The Draft EIR identifies Mitigation Measure 3.10-4a to place new shallow wells at least 250 feet from the nearest Specific Plan Area boundary. In addition, to prevent potential adverse effects to domestic wells, Mitigation Measure 3.10-4b is proposed to implement a groundwater level monitoring program and curtail pumping of nearby Specific Plan Area wells if drawdown in excess of 5 feet is observed near an existing off-site domestic well. Mitigation Measure 3.10-4b also requires the County to coordinate with the Groundwater Sustainability Agency on groundwater monitoring conducted as a part of implementation of the Groundwater Sustainability Plan for the vicinity of the Specific Plan Area. The Specific Plan also includes Water Policy WP 4 "*Groundwater for potable and non-potable use shall result in a sustainable yield through both water conservation and groundwater recharge measures*." The Draft EIR has considered reasonably foreseeable developments overlying the Delta-Mendota Groundwater Subbasin at and near the Specific Plan Area, and properly evaluated potential cumulative impacts associated with planned future land use changes and growth.

Please see Responses to Comments 6-28, 6-65, and 6-66, as well as Master Responses 1 and 2.

Response to Comment 6-65

The comment discusses two separate but related topics: groundwater levels and water supply. These topics are analyzed in detail throughout the Draft EIR, including in Section 3.10 (Hydrology and Water Quality) and Section 3.15 (Utilities and Service Systems) of Chapter 3, and in the cumulative impact analysis presented in Chapter 5.

As discussed below, Chapter 5 of the Draft EIR has been revised to further clarify the distinction between these two topics and the nature of the cumulative impact findings in Chapter 5. These edits are presented in Chapter 3 of the Final EIR, "Errata."

The two topics of groundwater levels and water supplies are embodied in the following threshold questions:

1. Will the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

2. Will the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Question 1 concerns potential groundwater resource-related effects from groundwater extraction, including groundwater level decline and storage depletion. Potential impacts addressed under this question include adverse effects on existing wells, economic effects related to the need for deeper pumping levels and wells, and depletion of groundwater storage, which can affect the availability of groundwater supplies. The availability of groundwater supplies is also relevant to Question 2. Question 2 concerns Utilities and Service systems, and includes effects related to decreases or changes in the available supply, the need for additional water entitlements, or the need for new or upgraded water treatment, storage, or conveyance facilities. Groundwater supplies are only one consideration under Question 2, which also considers surface water supplies and all other aspects of water utility service systems.

For the project-level analysis detailed in Chapter 3 of the Draft EIR, the County has presented substantial evidence that the Specific Plan would have a less-than-significant impact for both Questions 1 and 2, as they relate to Hydrology and Water Quality (Section 3.10) and to Utilities and Service Systems (Section 3.15). The commenter is referred to pages 3.10-40 through 3.10-46 of the Draft EIR for Question 1, and pages 3.15-11 through 3.15-13 of the Draft EIR for Question 2. The commenter is also referred to the Responses to Comments 6-49 and 6-50 for additional information regarding the potential effect of the Specific Plan on groundwater levels, the analysis of potential environmental impacts that could result from groundwater drawdown, and the adequacy of the water supply for the Specific Plan, which is reliant entirely on groundwater.

The Draft EIR also presents a cumulative assessment for Questions 1 and 2 and associated environmental resource areas in Chapter 5. In this assessment, the Draft EIR takes into account not just the impacts of the Specific Plan, but impacts of past, present, and reasonably foreseeable future plans, projects, actions, and related trends that may combine with the Specific Plan to create cumulative impacts. The County has conservatively developed a broad and long-range cumulative context to ensure comprehensive treatment of any cumulative impact that could foreseeably be related to the Specific Plan. The Draft EIR considers the Stanislaus Council of Governments Regional Transportation Plan/Sustainable Communities Strategy, which was developed at the regional level and considers proposed land use changes in San Joaquin County and Merced County, as well as Stanislaus County (both incorporated and unincorporated areas), as well as the County's General Plan to establish the overall cumulative context. For the resource areas of Hydrology and Water Quality and Utilities and Service Systems, the Draft EIR and the Groundwater Resource Impact Assessment prepared to support it (which is included as Appendix B of the Final EIR) also considered historical groundwater level trends and water demand forecasts in Urban Water Management Plans and planning studies in the area that could be affected by drawdown from the Specific Plan wells. In addition, implementation of the Sustainable Groundwater Management Act (SGMA) and potential future changes in agricultural water demand and surface water deliveries were considered.

Since the circulation of the Draft EIR (on June 26, 2018), the County certified the "Final Program Environmental Impact Report for the Stanislaus County Discretionary Well Permitting and Management Program" (JJ&A 2018), hereby incorporated by reference, which is the program under which the Specific Plan wells will be permitted. The Well Permitting Program EIR includes a County-wide cumulative impact assessment based on the results of an extensive regional groundwater modeling study. A numerical groundwater flow model was constructed to simulate a range of future groundwater pumping changes that could result from growth and development, and the resulting urban water demand growth, rural domestic demand growth, and agricultural groundwater demand changes. As discussed below, the findings of this study further corroborate the impact findings contained in the Draft EIR related to groundwater levels.

With respect to Question 1 and the groundwater supply aspects of Question 2, both the Draft EIR and the Well Permitting Program EIR evaluate whether increases in groundwater demand in the region would have the potential to lower groundwater levels or decrease the amount of usable groundwater supplies in storage. The Delta-Mendota Subbasin has been designated as critically overdrafted by the Department of Water Resources, largely due to pumping-induced land subsidence south of Stanislaus County. The impact analyses in both the Draft EIR and Well Permitting Program EIR evaluate the concern that increased reliance on groundwater could occur due to population changes, changes in agricultural land use and irrigation practices, and decreased surface water deliveries due to persistent drought conditions and changing surface water allocations. Both this EIR and the Well Permitting Program EIR conclude that these impacts will be less than cumulatively considerable, as discussed further below.

Current and historical groundwater level trends provide an important context when evaluating cumulative impacts related to groundwater levels. The Groundwater Resources Impact Assessment prepared to support the Draft EIR states that groundwater levels in northern portions of the Delta-Mendota Groundwater Subbasin were generally hydrologically balanced from 1993 to 2008. A study found minimal apparent net change in groundwater elevations, which indicates that there is an overall equilibrium between groundwater discharge (including pumping) and recharge in this region. Furthermore, water levels near the Specific Plan Area were found to be stable over the period of record (since 2011), which indicates recent pumping rates near the Specific Plan Area have been sustainable on an annual basis, even during the recent drought. A review of several hydrographs in the DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) for wells located near the Specific Plan Area indicates groundwater levels, while still variable, have shown an overall increasing trend after the recent drought through the present. This is consistent with observations for a study conducted further to the north in the Delta-Mendota Subbasin (JJ&A 2015). Based on this information, the Specific Plan Area is not experiencing overdraft, and the proposed pumping will not contribute to any ongoing adverse groundwater effects or cumulatively considerable impacts in the Specific Plan Area that are resulting from current groundwater management conditions.

When assessing future cumulative impacts under Question 1 and the groundwater supply aspects of Question 2, it is important to note that long-term groundwater demand conditions are currently uncertain because the Groundwater Sustainability Plans (GSPs) required to comply with the SGMA are still being developed, and the outcome of other regulatory requirements that could profoundly affect the nature of water supply availability in the area (i.e., the Bay-Delta Water Quality Control Plan amendments proposed by the State Water Resources Control Board) are currently uncertain. Simulation of a range of long-term groundwater demand trends for the Well Permitting Program EIR indicates that, in the absence of GSP implementation, there is a theoretical potential for groundwater levels to decline by tens of feet in some areas, depending on the amount and distribution of future groundwater extraction increases. Under such a scenario, the use of some existing wells could be adversely affected, groundwater supplies could become less economical and less available, and other adverse environmental, economic and societal effects could occur. However, development and implementation of GSPs under SGMA is required to mitigate such adverse effects, and to prevent "Undesirable Results," as defined in SGMA and in the County Groundwater Ordinance. As discussed in the Response to Comment 6-49, these "Undesirable Results" relate directly to Questions 1 and 2, above, as well as several other groundwater-related impact threshold questions examined in the Draft EIR. GSPs will define the sustainable yield of the subbasin, identify any special management areas, define management objectives, criteria and thresholds, and establish monitoring networks. After GSPs are adopted, GSAs will be responsible for their implementation and enforcement, with specific requirements for future Undesirable Results to be avoided, and any existing Undesirable Results to be ameliorated by 2042 in accordance with defined milestones. If GSAs fail to adopt adequate GSPs or fail to adequately implement them, the SGMA requires the State to intervene to ensure that the required sustainability goals are met.

The County Groundwater Ordinance also allows the County to intervene and regulate unsustainable groundwater extraction prior to State intervention, providing an additional safeguard against unsustainable groundwater extraction.

For these reasons, although the precise nature of the measures contained in local GSPs cannot yet be known, their effect on cumulative environmental impacts related to groundwater level decline and storage depletion are a regulatory certainty that will be enforced by both the State and the County. The actions required to be implemented by GSAs to comply with SGMA are reasonably expected to decrease any cumulative effects resulting from groundwater extraction, so that there would be no significant cumulative impact.

However, as stated above, Question 2 is related to water supply in a broader context than groundwater alone, and the County conservatively treated the cumulative impact assessment to Utilities and Service Systems at a broader scale, presenting details on water supply and demand related to the city of Patterson, city of Newman, Del Puerto Water District, Westley Community Services District, Patterson Irrigation District, Oak Flat Water District, Western Hills Water District, Crows Landing Community Services District, West Stanislaus Irrigation District, Eastin Water District, Central California Irrigation District, and El Solyo Water District. As a whole, these service systems depend not only on the availability of groundwater, but on surface water deliveries from the State and federal water projects, diversions from the San Joaquin River, and reclaimed water. In addition, water deliveries may be affected by water exchange agreements between districts or their customers that include surface, as well as groundwater, and by water transfers under the Warren Act.[7] This regional interdependence of supply and demand is made more complicated by the fact that the proposed amendments to the Bay Delta Water Quality Control Plan are not yet finalized, and their potential effects on regional supply and demand relationships are not

[7] The Warren Act of February 21, 1911, authorizes the Bureau of Reclamation to execute contracts for the conveyance and storage of non-Central Valley Project (CVP) water in Federal facilities when excess capacity exists. In addition to the Warren Act, Reclamation also uses the authority of §14 of the Reclamation Project Act of 1939 and §3408(c) of Central Valley Project Improvement Act (CVPIA) to facilitate the conveyance of non-CVP water and "water rights water" from willing sellers to willing buyers. Reclamation routinely facilitates such water transfers.

yet known. As such, the County conservatively determined that the Specific Plan's water demand could result in a significant cumulative impact to water service systems in the region, by indirectly adding to future effects on the water demand those systems must serve, or the amount of and sources of water supplies available to them**.** While the project-level impact related to groundwater demand is demonstrated to be less than significant in Chapter 3.15 of the Draft EIR based on a detailed water supply assessment (see Draft EIR, pages 3.15-11 through 3.15-13), the potential interplay between a water demand of the scale of the Specific Plan with future demand and supply changes in the area cannot be reliably predicted at this time, and could incrementally contribute to adverse water supply and demand changes affecting the cities, community service districts, water districts, and irrigation districts in the area. This is conservatively assumed to be a cumulatively considerable impact.

The Specific Plan includes goals, policies, and design guidelines, including goals to incorporate water-sensitive site design principles in the landscape, infrastructure, and building design, including on-site stormwater management. As stated in Chapter 5 of the Draft EIR, there is no additional feasible mitigation that can be identified at this time to allow the County to achieve the basic project objectives and further reduce water demand. It is not possible to predict if an increase in groundwater demand for a Specific Plan of this size would be less than cumulatively considerable within the cumulative context described above; therefore, the impact is conservatively assumed to be significant and unavoidable.

Response to Comment 6-66

See Master Response 1, which provides an overview of the extensive analysis provided in the Draft EIR related to growth inducement.

As *Napa Citizens for Honest Government v. Napa County Bd. of Supervisors*, 91 Cal. App.4th at p. 20 (2001) explains, the level of detail required for growth-inducing impacts is less than what is required for a project's direct impacts on the environment:

> "Nothing in the Guidelines, or in the cases, requires more than a general analysis of projected growth. The detail required in any particular case necessarily depends on a multitude of factors, including, but not limited to, the nature of the project, the directness or indirectness of the contemplated impact and the ability to forecast the actual effects the project will have on the physical environment."

As a result, the court in Napa Citizens concluded that it would not be reasonable to require the EIR to "undertake a detailed analysis of the results of such growth" [91 Cal. App.4th at p. 369]. A generalized analysis of growth-inducing impacts was also upheld in *Clover Valley Foundation v. City of Rocklin*, 197 Cal. App. 4th, 200, 227 (2011).

The requirements to provide a generalized discussion of a project's growth-inducing impacts should not be confused with CEQA's requirements for mitigation. As stated in *Napa Citizens* [91 Cal. App.4th at p. 371]

> "Neither CEQA itself, nor the cases that have interpreted it, require an EIR to anticipate and mitigate the effects of a particular project on growth on other areas. In circumstances such as these, we think that it is enough that the FSEIR warns interested persons and governing bodies of the probability that additional housing will be needed so that they can take steps to prepare for or address that probability. The FSEIR need not forecast the impact that the housing will have on as

> yet unidentified areas and propose measures to mitigate that impact. That process is best reserved until such time as a particular housing project is proposed."

Thus, pursuant to *Napa Citizens*, growth-inducing effects of proposed projects should be acknowledged but discussed in less detail than other, more direct effects resulting from projects (see also *Defend the Bay*, 119 Cal.App.4th at pp. 1261, 1266 ["If a project will create jobs and bring people into the area, the EIR must discuss the resulting housing needs, but not in minute detail. It is enough to identify the housing required and its probable location"]). The analysis of growth-inducing impacts, therefore, is necessarily unique and distinct from the analysis in the individual impact chapters. This is because creating demand for growth does not in and of itself cause a direct physical impact; only a proposed project at a specific location would create physical impacts. Thus, no revisions to the Draft EIR are necessary based upon the comments.

Response to Comment 6-67

Section 2.6 of Chapter 2, "Project Description," of the Draft EIR provides a brief overview of the necessary sewer infrastructure improvements. A detailed discussion is provided in in Section 3.15, "Utilities and Service Systems," of the Draft EIR, and revisions are shown in Response to Comment 6-15 above.

See also Master Response 1.

Response to Comment 6-68

Please see Response to Comment 6-15.

Response to Comment 6-69

Please see Response to Comment 6-15.

Response to Comment 6-70

The following revision has been made on page 3.15-3 of the Draft EIR, the following text has been revised. The sentence referenced by the commenter has been revised. Please see Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR.

> The City has prepared improvement plans ~~and acquired land~~ to expand the WQCF capacity. WQCF expansion, generally referred to as the Phase III Expansion, would increase the plant capacity by 1.25 mgd to bring the total plant capacity to 3.5 mgd with a reliable treatment capacity of 3.1 mgd (Central Valley Regional Water Quality Control Board 2007, ~~Blackwater~~ Black Water Consulting Engineers 2017). The Central Valley Regional Water Quality Control Board has already authorized expansion of the facility under Order R5-2007-0147, which was issued in November of 2007 (Central Valley Regional Water Quality Control Board 2007). Additional WQCF expansion will be required to treat wastewater flows at buildout of the City of Patterson and Diablo Grande. Phase IV and Phase V expansions would increase the WQCF reliable treatment capacity to 4.25 mgd and 6.5 mgd, respectively (~~Blackwater~~ Black Water Consulting Engineers 2017). It is expected that future expansions would occur before the WQCF exceeds reliable capacity.

Response to Comment 6-71

The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the environmental impact analysis in the Draft EIR. The comment is noted and no further response is required.

Response to Comment 6-72

Please refer to Response to Comment 6-8.

Response to Comment 6-73

Please refer to Response to Comment 6-8.

Response to Comment 6-74

Please refer to Response to Comment 6-15.

Response to Comment 6-75

See Responses to Comments 6-10 through 6-18 related to wastewater treatment.

Response to Comment 6-76

WHWD flows would be verified at the time of design of Specific Plan wastewater infrastructure. However, the Specific Plan contemplates construction of a separate new pipeline on Ward Avenue and therefore, there will not ultimately be any relationship to these flows. Project cost estimates in Appendix H of the Specific Plan include construction of this sewer pipeline.

Response to Comment 6-77

Please see Response to Comment 6-9.

Response to Comment 6-78

Please see Response to Comment 6-17.

Response to Comment 6-79

The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. As stated in Response to Comment 6-15, to the text of Impact 3.15-4 in Section 3.15, "Utilities and Service Systems," of the Draft EIR has been revised. Please also see Response to Comment 6-8 and Chapter 3 of this Final EIR, "Errata." These edits clarify that temporary wastewater conveyance infrastructure required to serve the Specific Plan and do not change the analysis or conclusions of the Draft EIR. See Response to Comment 6-9 for a discussion of the City's WQCF.

Response to Comment 6-80

The State Water Quality Control Board supports the use of recycled water to promote water conservation in the Policy for Water Quality Control for Recycled Water (Recycled Water Policy). The purpose of the Recycled Water Policy is to increase the use of recycled wastewater from wastewater sources, including greywater, agricultural return water, industrial wastewater, and water produced from oil field operations. These types of water reuse are regulated through other programs. The Recycled Water Policy provides goals for recycled water use in California, guidance for use of recycled water that considers protection of water quality, criteria for streamlined permitting of recycled water projects, and requirements for monitoring recycled water for constituents of emerging concern. To the extent that future permits are required for this activity, and as relevant, the County will consult with other agencies. Response to Comment 6-81

The commenter states that Page 2-23 of the Draft EIR contains the duplicate phrase, "and other relevant standards." The phrase "and other relevant standards" has been deleted on page 2-23 of Chapter 2, "Project Description," of the Draft EIR. Please also see Response to Comment 6-8 and Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR.

Response to Comment 6-82

The duplicate word has been deleted on Page 3.15-1 in Section 3.15, "Utilities and Service Systems," of the Draft EIR. Please see Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR.

Response to Comment 6-83

The word "transmission" has been deleted from the last sentence on page 3.15-2 in Section 3.15, "Utilities and Service Systems," of the Draft EIR. Please see Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR.

Response to Comment 6-84

"Black Water" has been revised throughout Section 3.15, "Utilities and Service Systems," of the Draft EIR to reflect the company name is two words instead of one word.

Response to Comment 6-85

The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. The comment is noted and no further response is required.

Response to Comment 6-86

The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. The comment is noted and no further response is required.

Response to Comment 6-87

The comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. The comment is noted and no further response is required.

Response to Comment 6-88

The data provided in this comment are summarized in Impacts 3.15-4 and 3.15-5 in Section 3.15, “Utilities and Service Systems,” of the Draft EIR. Please see Responses to Comments 6-8 and 6-15 above.

Response to Comment 6-89

The comment letter identifies impact fees and cost sharing estimates identified in the Black Water Engineers Consultants technical memorandum. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. However, this comment is published in this Response to Comments document for public disclosure and for decision maker consideration.

Response to Comment 6-90

These findings are summarized in Section 3.15, “Utilities and Service Systems,” of the Draft EIR. The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project.

Response to Comment 6-91

The comment does not specify additional information needed in the Draft EIR and the comment does not pertain to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. See Appendix A of this Final EIR, which is the Transportation Infrastructure Plan.

Response to Comment 6-92

When the study included in the Draft EIR was prepared, it utilized the “Patterson Traffic Model”, which was the most recent version of the StanCOG model with the land use and roadway network contained in the Patterson General Plan.

Response to Comment 6-93

Please see Response to Comment 6-92.

Response to Comment 6-94

The comment applies to the transportation infrastructure plan. Although this is a long analysis segment, it was discovered that splitting the section into smaller subsections would not change the results or recommendations.

This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the Specific Plan.

Response to Comment 6-95

The transportation infrastructure plan has been revised, as suggested. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. Appendix A to this Final EIR is the Transportation Infrastructure Plan.

Response to Comment 6-96

The transportation infrastructure plan has been revised to correct the typographical errors in Table VIII. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. No further response is required. Appendix A to this Final EIR is the Transportation Infrastructure Plan.

Response to Comment 6-97

The transportation infrastructure plan has been revised to correct the error in Table IX. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project. No further response is required.

Response to Comment 6-98

The transportation infrastructure plan has been revised to correct the error in Table XI. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project.

Response to Comment 6-99

The transportation infrastructure plan has been revised to correct these formatting errors. This comment does not raise questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project.

Response to Comment 6-100

The commenter discusses the age of the data used in the traffic report and provides information on recent traffic growth and provides examples of increased vehicles per day and percent growth on Sperry Avenue. The project impacts, mitigation measures, and fair-share analyses are based on the cumulative and cumulative plus project scenarios, which include all land use in the Patterson General Plan, including developments that have occurred since 2014. Therefore, the findings and conclusions of the Transportation Infrastructure Plan, upon which the Draft EIR is based, are relevant. Refer also to the Response to Comment 6-55.

Response to Comment 6-101

As explained in Response to Comment 6-22, Ward Avenue and Sperry Avenue has no feasible mitigation due to the presence of residential development in the southeast quadrant of the intersection – the traffic study indicates that the future South County Corridor (not accounted for in the analysis) will likely relieve Sperry Avenue congestion. The intersection of Ward Avenue and Las Palmas Avenue was recently improved and has no level of service issues in cumulative conditions.

Response to Comment 6-102

Please see Mitigation Measure 3.14-1 on page 3.14-16 of the Draft EIR, which requires signalization of Ike Crow Road/SR 33 and Fink Road/Bell Road. The EIR has been revised to add the requirement to signalize intersection #22, Marshall Road/Ward Avenue, too. These signalizations would provide LOS of at least C in cumulative plus project conditions. This revision is also shown in Chapter 3 of this Final EIR.

Response to Comment 6-103

Two versions of the October 13, 2017 Transportation Infrastructure Plan were produced, one with the project-only trips and another one that shows total trips. The County has included a PDF showing project-only morning and afternoon peak-hour trips as Appendix D.

Response to Comment 6-104

The traffic study notes a degradation of the LOS at several key City intersections including: I-5 ramps/Sperry, Ward Ave/Sperry, Ward Ave/Las Palmas, and Sperry Ave/SR 33.

The comment letter identifies degradation of LOS at key City intersections. These intersections are discussed in Section 3.14, "Traffic and Transportation," of the Draft EIR.

Response to Comment 6-105

Impact 3.14-1 in Section 3.14, "Traffic and Transportation," of the Draft EIR discuss the Specific Plan's impacts on study area intersections. Mitigation Measure 3.14-1 requires that the City would contribute its fair share to the intersection improvements that would operate at a LOS that would exceed a jurisdiction's thresholds (see p. 3.14-16 of the Draft EIR).

Response to Comment 6-106

On page 5-32, Table 5-5, the following revisions have been made to Intersections 9 and 13:

Table 5-5
Intersection Level of Service: 2035 No-Project and 2035 plus Project Conditions

Intersection		Traffic Control Type	2035 No-Project				2035 plus Project			
			A.M. Peak		P.M. Peak		A.M. Peak		P.M. Peak	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9	Ward Avenue / M Street	Signalized	35.5	D	33.3	C	48.0	D	~~97~~38.9	~~F~~D
13	Las Palmas Avenue / SR 33	Signalized	21.0	C	21.0	C	30.6~~6.0~~	C	24.1	C

This does not affect the findings or mitigation measures in the Draft EIR. This is shown also in Chapter 3 of this Final EIR.

2.3.7 LETTER 7, CHEVRON, DATED MARCH 6, 2018

Letter 7

Rachel Wyse - Crows Landing Industrial Business Park Draft Environmental Impact Report - Comment Lettter

From:	"Anzelon, Danny B."
To:	"Wyse, Rachel"
Date:	3/6/2018 2:36 PM
Subject:	Crows Landing Industrial Business Park Draft Environmental Impact Report - Comment Lettter
CC:	"Hoang, Tan T.", "Hurd, Michael T."
Attachments:	Crows Landing DEIR Comment Letter.pdf

Good afternoon, Rachel.

On behalf of Chevron Environmental Management Company (CEMC), please see the attached comment letter for Crows Landing Industrial Business Park Draft Environmental Impact Report. This letter describes the background of inactive, historic crude-oil pipelines in Stanislaus County, including one map showing the approximate location of the former Old Valley Pipeline (OVP) and Tidewater Associated Oil Company (TAOC) alignments with respect to the proposed phasing plan (Figure 1). 7-1

Please let me know if you have any questions. A hard copy of this letter will also be mailed to your office.

Thank you.

-Danny

Daniel Anzelon | Leidos
Project Geologist | Environmental Restoration Division
leidos.com/infrastructure

Mike N. Oliphant
Project Manager
Mining and Specialty
Portfolio

Chevron Environmental
Management Company

March 6, 2018

Stakeholder Communication – Stanislaus County

Ms. Rachel Wyse
Associate Planner
Stanislaus County Planning & Community Development

Subject: **Comments on the Crows Landing Industrial Business Park Specific Plan Draft Environmental Impact Report**
Chevron Environmental Management Company
Historical Pipeline Portfolio–Bakersfield to Richmond

Dear Ms. Wyse:

On behalf of Chevron Environmental Management Company (CEMC), Leidos, Inc. (Leidos; CEMC contract consultant) recently reviewed the Crows Landing Industrial Business Park Specific Plan Draft Environmental Impact Report. The information contained in this letter may help you to understand something about Chevron's former pipeline operations in Stanislaus County, as residual weathered crude oil, abandoned pipeline, and asbestos-containing materials (ACM) could potentially be encountered during subsurface construction activities in the vicinity of these former pipeline locations within the existing former pipeline rights of way (ROWs).

Portions of the former Old Valley Pipeline (OVP) and Tidewater Associated Oil Company (TAOC) pipelines existed within the vicinity of the proposed planning area. These formerly active pipelines were constructed in the early 1900s and carried crude oil from the southern San Joaquin Valley to the San Francisco Bay Area. Pipeline operations for the OVP ceased in the 1940s, and in the 1970s for the TAOC pipelines. When pipeline operations ceased, the pipelines were taken out of commission. The degree and method of decommissioning varied: in some instances the pipelines were removed, while in others they remained in place. Because these pipelines have been decommissioned, with the majority of pipelines having been removed, they are not readily identified as underground utilities through the Underground Service Alert North System or utility surveys. Figure 1 illustrates the location of the former OVP and TAOC ROWs with respect to the proposed planning area. The locations of the pipelines shown on Figure 1 are based on historical as-built drawings and the approximated positional accuracy of the alignments is generally +/- 50 feet. The OVP and TAOC pipelines were installed at depths of up to 10 feet below ground surface. The steel pipelines were typically encased in a protective coating composed of coal tar and ACM. 7-2

Working under the direction of State regulatory agencies, CEMC conducted risk assessments at numerous locations with known historical crude-oil release points along the former OVP and TAOC pipelines. Analytical results from these risk assessments indicated that the crude-contaminated soil was non-hazardous. Accordingly, it is likely that if soil affected by the historical release of crude oil from these former pipelines is encountered during construction 7-3 activities it may be reused as backfill on site. Properly abandoned crude-oil pipeline may be left in the ground. Parties conducting construction activities in the vicinity of these former pipeline ROWs may wish to use the information provided in this letter to help prepare for the possibility of encountering abandoned pipelines and pipeline-related ACM during the course of their work. 7-3 Cont'd

For more information regarding these historic pipelines, please visit http://www.hppinfo.com/. If you would like additional information, or would like to request more detailed maps, please contact Leidos consultants Mike Hurd at (510) 466-7161 or Daniel Anzelon

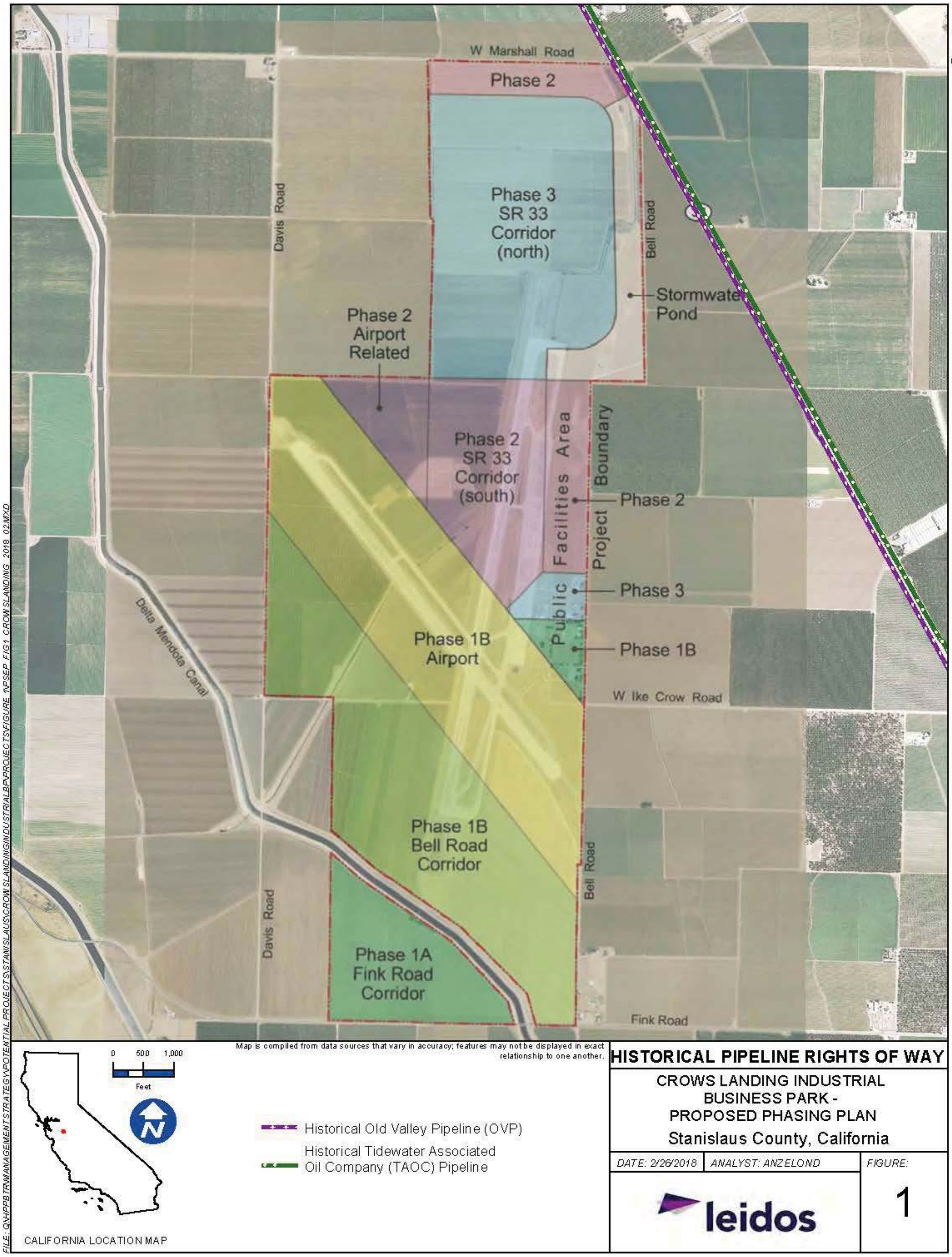
Sincerely,

Mike Oliphant

MO/klg

Enclosure:
Figure 1. Historical Pipeline Rights of Way – Crows Landing Industrial Business Park – Proposed Phasing Plan

cc: Mr. Mike Hurd – Leidos


W Marshall Road
Phase 2
Phase 3
SR 33
Corridor
(north)
Davis Road
Bell Road
Stormwater
Pond
Phase 2
Airport
Related
Phase 2
SR 33
Corridor
(south)
Public Facilities Area
Project Boundary
Phase 2
Phase 3
Phase 1B
Delta Mendota Canal
Phase 1B
Airport
W Ike Crow Road
Phase 1B
Bell Road
Corridor
Bell Road
Davis Road
Phase 1A
Fink Road
Corridor
Fink Road
0 500 1,000
Feet
Map is compiled from data sources that vary in accuracy; features may not be displayed in exact relationship to one another.
Historical Old Valley Pipeline (OVP)
Historical Tidewater Associated Oil Company (TAOC) Pipeline
CALIFORNIA LOCATION MAP
HISTORICAL PIPELINE RIGHTS OF WAY
CROWS LANDING INDUSTRIAL BUSINESS PARK - PROPOSED PHASING PLAN
Stanislaus County, California
DATE: 2/26/2018
ANALYST: ANZELOND
FIGURE:
1
leidos

7-2
Cont'd

RESPONSE TO COMMENT LETTER 6 – CHEVRON

Response to Comment 7-1

See Responses to Comments 7-2 and 7-3.

Response to Comment 7-2

The County appreciates the information provided by Chevron related to the former OVP and TAOC pipelines. Given that earthmoving activities in the northeastern portion of the project site have the potential to encounter these former pipelines, information related to the existence and location these pipelines has been added to the "Environmental Setting" subsection of Draft EIR Section 3.9, "Hazards and Hazardous Materials," as shown in Chapter 3, "Errata," of this Final EIR.

Response to Comment 7-3

The County appreciates the information provided by Chevron related to the former OVP and TAOC pipelines. Given that earthmoving activities in the northeastern portion of the project site have the potential to encounter these former pipelines, information related to the results of Chevron's former analytical results has been added to Draft EIR Impact 3.9-2 in Section 3.9, "Hazards and Hazardous Materials," as shown in Chapter 3, "Errata," of this Final EIR. Because the materials have been determined to be non-hazardous, impacts from encountering these former pipelines would be less than significant, and no mitigation is required.

This page intentionally left blank

2.3.8 LETTER 8, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, DATED MARCH 6, 2018

Letter 8

Rachel Wyse - SJVAPCD Comment Letter for the Crows Landing Industrial Business Park Specific Plan EIR

From: Sharla Yang
To: Rachel Wyse, Stan County Planning, 3/6/2018 2:32 PM
Date: SJVAPCD Comment Letter for the Crows Landing Industrial Business Park Specific
Subject: Plan EIR

Attachments: 20180043 Comment Letter.pdf

Good afternoon,

Attached is a copy of the District's comment letter for the Crows Landing Industrial Business Park Specific Plan EIR. The original signed copy will follow in the mail. Please feel free to contact me should you have any questions or concerns.

Thank you,

Sharla Yang
Air Quality Specialist
San Joaquin Valley Air Pollution Control District

STAR - Service & Teamwork & Attitude & Respect

HEALTHY AIR LIVING
www.healthyairliving.com
Make one change for clean air!

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

MAR 06 2018

RECEIVED
MAR 8 2018
STANISLAUS CO. PLANNING & COMMUNITY DEVELOPMENT DEPT.

Rachel Wyse
County of Stanislaus
Planning & Community Development Department

Project: Draft Environmental Impact Report (EIR) for the Crows Landing Industrial Business Park Specific Plan

District CEQA Reference No: 20180043

Dear Ms. Wyse:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Draft Environmental Impact Report (EIR) for the Crows Landing Industrial Business Park project. The proposed project consists of a request to adopt a Specific Plan allowing for the development of a 1,528 acre project site to support a mix of aviation-compatible industrial and business park uses, general aviation, aviation-related land uses, public facilities, a multimodal (bicycle/pedestrian) transportation corridor, and supportive infrastructure. The proposed project is anticipated to be developed in three phases over 30-years with a 370 acre public-use airport and 14 million square feet of building space with the potential to generate 14,500 jobs (Project). The Project is located approximately 1.5 mile east of Interstate 5 (I-5) and 2.5 miles west of the community of Crows Landing in an unincorporated portion of western Stanislaus County. The District offers the following comments: 8-1

1. <u>California Emissions Estimator Model (CalEEMod)</u> 8-2

The District recommends that future environmental documents use the current version of CalEEMod to analyze criteria pollutant emissions.

On December 1, 2017, the District transitioned from the use of the California Emissions Estimator Model (CalEEMod) version 2013.2.2 to the recently updated CalEEMod version 2016.3.2 when reviewing or preparing air impact assessments in compliance with provisions with District Rule 9510 (Indirect Source Review), California Environmental Quality Act (CEQA), and National Environmental Policy Act (NEPA) within the San Joaquin Valley Air Basin.

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region | Central Region (Main Office) | Southern Region

www.valleyair.org www.healthyairliving.com

Printed on recycled paper.

- As of December 1, 2017, the District requires the use of CalEEMod version 2016.3.2 when reviewing or preparing air impact assessment in compliance with CEQA. 8-2 Cont'd

- If your agency has not already signed up to the District's listserv to receive notices for advisories related to CEQA, the District recommends subscribing to the CEQA listserv at http://www.valleyair.org/lists/list.htm.

2. Significance Threshold for Toxic Air Contaminants (TACs)

The District recommends updating the Toxic Air Contaminants (TACs) significance threshold to 20 in one million for carcinogenic risk.

On Page 3.2-23, the Draft EIR list the thresholds of significance for toxic air contaminants in Table 3.2-6. The table lists a significance threshold of 10 in one million for carcinogenic risk. The District would like to clarify that the District's current significance threshold for carcinogenic risk is 20 in one million. Therefore, the District recommends the table be updated to show the correct significance threshold for carcinogenic risk. Current District thresholds of significance can be found online at: http://www.valleyair.org/transportation/ceqa_idx.htm. 8-3

3. Mitigation Measure 3.2-1a

The District recommends compliance with Rule 9510 and using all Tier 4 construction equipment listed in Mitigation Measure 3.2-1a be separated into two separate mitigation measures. 8-4

On Page 3.2-27, the Draft EIR's Mitigation Measure 3.2-1a states:

> *"As applicable, based on the project size thresholds specified in Rule 9510 (Indirect Source Review), projects within the Specific Plan Area shall comply with SJVAPCD's Rule 9510 Indirect Source Review (ISR). Site developers/leaseholders/project applicants who wish to develop facilities in the Specific Plan area shall construct all facilities using current phase construction equipment (currently Tier 4)."*

This mitigation measure identifies Stanislaus County and the District as the enforcement agencies. The District does not foresee any issue with assisting with enforcing compliance with Rule 9510 because the District already has the mechanism and authority to enforce Rule 9510 as it is one of the District's rules. However, the District does not have the mechanism to enforce site developers, leaseholders, or project applicants to use all current phase construction equipment nor have a way to identify those who would be required to comply with this mitigation measure. Therefore, the District recommends that the Draft EIR be revised to separate this mitigation measure into two separate mitigation measures and to clearly identify how Stanislaus County would identify developers, leaseholders, or project applicants subject to comply with the mitigation measure and how the County would enforce the use of "current phase construction equipment", i.e.: Tier 4. 8-4 Cont'd

4. **Health Risk Screening/Assessment**

The District recommends that potential health risks be further reviewed when approving future projects, including those that would be exempt from CEQA requirements. 8-5

Future development within the Crows Landing Industrial Business Park Specific Plan will contribute to the overall decline in air quality due to increased traffic and ongoing operational emissions. New developments may require further environmental review and mitigation.

The Draft EIR did not perform a health risk screening/assessment. Accurate quantification of health risks and operational emissions requires detailed site specific information, e.g. type of emission source, proximity of the source to sensitive receptors, and trip generation information. Therefore, the District recommends that a health risk screening/assessment on surrounding receptors (on-site and off-site) resulting from operational and multi-year construction Toxic Air Contaminants (TACs) emissions be further reviewed when approving future projects, including those that would be exempt from CEQA requirements. 8-6

A health risk screening/assessment identifies potential TACs impact on surrounding sensitive receptors such as hospitals, daycare centers, schools, work-sites, and residences. TAC's are air pollutants identified by the Office of Environmental Health Hazard Assessment/California Air Resources Board (OEHHA/CARB) (https://www.arb.ca.gov/toxics/healthval/healthval.htm) that pose a present or potential hazard to human health. A common source of TACs can be attributed to diesel exhaust emitted from both mobile and stationary sources. Industry specific TACs generated must also be identified and quantified.

i) The District recommends conducting a screening analysis that includes all sources of emissions. A screening analysis is used to identify projects which may have a significant health impact. A prioritization, using CAPCOA's updated methodology, is the recommended screening method. A prioritization score of 10 or greater is considered to be significant and a refined Health Risk Assessment (HRA) should be performed. The prioritization calculator can be found at: http:www.valleyair.org/busind/pto/emission_factors/Criteria/Toxics/Utilities/PRIORITIZATION%20RMR%202016.XLS.

ii) The District recommends a refined HRA for projects that result in a prioritization score of 10 or greater. It is recommended that the project proponent contact the District to review the proposed modeling protocol. The project would be considered to have a significant health risk if the HRA demonstrates that the project related health impacts would exceed the Districts significance threshold of 20 in a million for carcinogenic risk and 1.0 for the Acute and Chronic Hazard Indices. 8-6 Cont'd

More information on toxic emission factors, prioritizations and HRAs can be obtained by:

- E-Mailing inquiries to: hramodeler@valleyair.org; or
- The District can be contacted for assistance; or
- Visiting the Districts website (Modeling Guidance) at http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm

5. <u>District Rule 9510 Indirect Source Review (ISR)</u>

Individual development projects would be subject to District Rule 9510 Indirect Source Review (ISR) if upon full build-out the project would include or exceed any one of the following: 8-7

- 50 dwelling units
- 2,000 square feet of commercial space;
- 25,000 square feet of light industrial space;
- 100,000 square feet of heavy industrial space;
- 20,000 square feet of medical office space;
- 39,000 square feet of general office space; or
- 9,000 square feet of educational space; or
- 10,000 square feet of government space; or
- 20,000 square feet of recreational space; or
- 9,000 square feet of space not identified above

District Rule 9510 is intended to mitigate a project's impact on air quality through project design elements or by payment of applicable off-site mitigation fees. Any applicant subject to District Rule 9510 is required to submit an Air Impact Assessment (AIA) application to the District no later than applying for final discretionary approval.

If approval of the subject Project constitutes the last discretionary approval by your agency, the District recommends that demonstration of compliance with District Rule 9510, including payment of all applicable fees before issuance of the first building permit, be made a condition of Project approval. Information about how to comply with District Rule 9510 can be found online at: http://www.valleyair.org/ISR/ISRHome.htm. The AIA application form can be found online at: http://www.valleyair.org/ISR/ISRFormsAndApplications.htm.

6. **District Rules and Regulations**

Individual development projects may also be subject to other District rules and regulations.

Individual development projects may also be subject to other District rules and regulations, including: Regulation VIII (Fugitive PM10 Prohibitions), Rule 4102 (Nuisance), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). In the event an existing building will be renovated, partially demolished or removed, the project may be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants). 8-8

The above list of rules is neither exhaustive nor exclusive. To identify other District rules or regulations that apply to this Project or to obtain information about District permit requirements, the applicant is strongly encouraged to contact the District's Small Business Assistance (SBA) Office Current District rules can be found online at: www.valleyair.org/rules/1ruleslist.htm.

7. **Reducing Vehicle Miles Traveled**

The District recommends design standards that reduce vehicles miles traveled.

8-9

The Crows Landing Industrial Business Park Specific Plan lays out a vision for this area over the plan's next 30-year horizon as a vibrant regional employment center that would provide residents and those living nearby Central Valley communities with opportunities to obtain sustainable-wage jobs that do not require long commute distances. The District is currently designated as extreme non-attainment of the federal national ambient air quality standard for ozone and non-attainment for PM2.5. Given the size of the Project, it is reasonable to conclude that mobile source emissions resulting from growth and development would have significant impacts on air quality. To reduce the Project related impacts on air quality, the Specific Plan should include design standards that reduce vehicle miles traveled (VMT). VMT can be reduced through encouragement of mixed-use development, walkable communities, etc. Recommended design elements can be found on the District's website at http://www.valleyair.org/ISR/ISROnSite Measures.htm.

8. **Voluntary Emission Reduction Agreement (VERA)**

The District recommends that the Draft EIR be revised to include a discussion on the feasibility of implementing a Voluntary Emission Reduction Agreement (VERA) for this Project. 8-10

As presented in the Draft EIR, after implementation of all feasible mitigation, the Project's construction and operational criteria pollutant emissions would have a significant and unavoidable impact on air quality. However, the Draft EIR does not discuss the feasibility of implementing a Voluntary Emission Reduction Agreement (VERA). As discussed below, the District believes that mitigation through a VERA is feasible in many cases, and recommends the Draft EIR be revised to include a discussion of the feasibility of implementing a VERA to mitigate Project specific impacts to less than significant levels.

8-10 Cont'd

A VERA is a mitigation measure by which the project proponent provides pound-for-pound mitigation of emissions increases through a process that develops, funds, and implements emission reduction projects, with the District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. To implement a VERA, the project proponent and the District enter into a contractual agreement in which the project proponent agrees to mitigate project specific emissions by providing funds for the District's Strategies and Incentive Program (SI). The funds are disbursed by SI in the form of grants for projects that achieve emission reductions. Thus, project specific impacts on air quality can be fully mitigated. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors.

In implementing a VERA, the District verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. The initial agreement is generally based on the projected maximum emissions increases as calculated by a District approved air quality impact assessment, and contains the corresponding maximum fiscal obligation. However, because the goal is to mitigate actual emissions, the District has designed flexibility into the VERA such that the final mitigation is based on actual emissions related to the project as determined by actual equipment used, hours of operation, etc., and as calculated by the District. After the project is mitigated, the District certifies to the lead agency that the mitigation is completed, providing the lead agency with an enforceable mitigation measure demonstrating that project specific emissions have been mitigated to less than significant.

The District has been developing and implementing VERA contracts with project developers to mitigate project specific emissions since 2005. It is the District's experience that implementation of a VERA is a feasible mitigation measure, and effectively achieves the emission reductions required by a lead agency, by mitigating project related impacts on air quality to a net zero level by supplying real and contemporaneous emissions reductions. To assist the Lead Agency and project proponent in ensuring that the environmental document is compliant with CEQA, the District recommends the environmental document be amended to include an assessment of the feasibility of implementing a VERA.

Additional information on implementing a VERA can be obtained by contacting District CEQA staff 8-10 Cont'd

9. **Referral Documents for New Developments** 8-11

The District recommends that referral documents for new development projects include the following:

A project summary detailing, at a minimum, the land use designation, project size, and proximity to sensitive receptors and existing emission sources.

The District recommends that a copy of the District's comments be provided to the Project proponent. If you have any questions or require further information, please call Sharla Yang

Sincerely,

Arnaud Marjollet
Director of Permit Services

Bri Clement

Brian Clements
Program Manager

AM: sy

RESPONSE TO COMMENT LETTER 8 – SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

Response to Comment 8-1

The County appreciates the commenter's review of the Draft EIR. The comment is noted and no further response is required.

Response to Comment 8-2

Although the Air District has not suggested that the analysis for this EIR use the updated version of CalEEMod, since it was initiated prior to the release of the new model, the County has nonetheless elected to prepare new analysis using the updated version of the model. The emissions estimates for construction-related and operational activities associated with implementation of the Specific Plan have been revised using the most recent CalEEMod Version 2016.3.2. Appendix F of this Final EIR provides updated modeling data and is available for review as part of the administrative record of this Final EIR.

The following updated emissions estimates are shown in Tables 3.2-7, 3.2-8, and 3.2-9 and in Tables 3.7-3 and 3.7-4. Please see also Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR. The conclusions of Impact 3.2-1 in Section 3.2, "Air Quality," of the Draft EIR remain the same; the proposed project's annual long-term operational emissions would still exceed the SJVAPCD thresholds of significance for ROG, NO_x, and_CO. Impacts associated with greenhouse gas emissions described in Section 3.7, "Greenhouse Gas Emissions," of the Draft EIR would remain cumulatively considerable.

Table 3.2-7
Unmitigated Construction-Related Emissions

Construction Phase	Emissions (tons)[1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	~~125.43~~118.17	~~165.30~~235.91	~~405.99~~186.74	~~1.10~~0.98	~~66.69~~61.30	~~21.36~~18.61
Phase 2	~~30.19~~29.78	~~34.18~~55.60	~~92.70~~51.72	~~0.31~~0.29	~~19.49~~22.48	~~6.23~~6.67
Phase 3	~~39.96~~37.97	~~10.78~~67.81	~~24.02~~46.54	~~0.05~~0.33	~~18.63~~22.18	~~5.04~~6.48
Total Construction Emissions	~~195.59~~185.92	~~210.26~~359.31	~~522.72~~285.01	~~1.46~~1.6	~~104.82~~105.96	~~32.63~~31.76
Annual Average Emissions (tons/year)[2]	~~6.52~~6.20	~~7.01~~11.98	~~17.42~~9.50	~~0.05~~0.05	~~3.49~~3.53	~~1.09~~1.06
Maximum Annual Emissions (tons/year)	~~15.31~~14.43	~~25.80~~35.14	~~58.1~~27.96	~~0.15~~0.14	~~8.36~~7.74	~~2.64~~2.27
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds?[3]	Yes	Yes	No	No	No	No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District

[1] All emissions are shown in units of tons unless noted otherwise.

[2] Total construction emissions were averaged over the total construction schedule (*i.e.*, 30 years) to calculate annual average construction emissions.

[3] Significance is determined using the maximum annual emissions.

Source: AECOM 2016

Table 3.2-8
Mitigated Construction-Related Emissions

Construction Phase	Emissions (tons) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	~~123.42~~116.02	~~136.96~~195.28	~~404.15~~188.00	~~1.10~~0.98	~~64.18~~60.07	~~19.50~~17.21
Phase 2	~~28.99~~28.44	~~21.99~~46.70	~~94.36~~53.10	~~0.31~~0.29	~~18.24~~21.43	~~5.42~~6.05
Phase 3	~~38.79~~36.15	~~4.34~~61.91	~~27.21~~49.72	~~0.05~~0.33	~~17.67~~21.24	~~4.54~~6.00
Total Construction Emissions	~~191.20~~185.92	~~163.29~~359.31	~~525.72~~285.01	~~1.46~~1.60	~~100.09~~105.96	~~29.46~~31.76
Maximum Annual Emissions (tons/year)	~~15.05~~14.43	~~23.35~~35.14	~~58.15~~27.96	~~0.15~~0.14	~~8.19~~7.74	~~2.49~~2.27
Annual Average Emissions (tons/year) [2]	~~6.37~~6.20	~~5.44~~11.98	~~17.52~~9.50	~~0.05~~0.05	~~3.34~~3.53	~~0.98~~1.06
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds? [3]	Yes	Yes	No	No	No	No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District

[1] All emissions are shown in units of tons unless noted otherwise.

[2] Total construction emissions were averaged over the total construction schedule (*i.e.*, 30 years) to calculate annual average construction emissions.

[3] Significance is determined using the maximum annual emissions.

Source: AECOM 2016

Table 3.2-9
Crows Landing Annual Operational Emissions (Full Buildout)

Construction Phase	Emissions (tons/year) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	~~103.49~~103.54	0.00	0.21	0.00	0.00	~~0.00~~0.43
Energy Sources	~~1.94~~1.86	~~17.65~~16.90	~~14.83~~14.20	~~0.11~~0.10	~~1.34~~1.28	~~1.34~~1.28
Mobile Sources	~~20.82~~3.34	~~59.23~~28.22	~~241.68~~71.42	~~0.97~~0.57	~~59.61~~6.80	~~17.01~~2.73
Transport Refrigeration Units	~~38.08~~44.79	~~277.87~~326.83	~~399.76~~470.21	~~0.66~~0.77	~~1.34~~1.58	~~1.34~~1.58
Aircraft LTO	11.46	44.97	-	-	-	-
Total Operational Emissions	~~175.79~~164.99	~~399.72~~416.93	~~656.48~~556.03	~~1.74~~1.44	~~62.29~~9.66	~~19.69~~5.59
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds?	Yes	Yes	Yes	No	~~Yes~~No	~~Yes~~No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; LTO = landing and take-off; SJVAPCD = San Joaquin Valley Air Pollution Control District. ~~N~~ROG and NO_X are the most critical emissions associated with aircraft and, as a result, other criteria air pollutants are not reported.

[1] All emissions are shown in units of tons unless noted otherwise.

Source: AECOM 2016

Table 3.7-3
Construction-Related GHG Emissions

Construction Phase/Year	Emissions (MT CO_2e)
Phase 1 Subtotal	**~~83,229~~92,894**
Phase 2 Subtotal	**~~21,969~~26,493**
Phase 3 Subtotal	~~4,416~~30,972
Total Construction Emissions	**~~109,613~~150,359**
Annual Average Construction Emissions	**~~3,654~~5,012**
Amortized Construction Emissions[1]	~~3,654~~5,012

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Totals may not appear to add exactly due to rounding.

[1] Construction emissions were amortized over 30 years.

Source: AECOM 2016

Table 3.7-4 Operational GHG Emissions	
Emissions Source	Emissions (MT CO_2e/yr)
Area	~~0.42~~0.43
Energy	~~19,332~~126,749
Mobile	~~65,902~~64,475
Waste	~~11,419~~12,654
Water	~~6,251~~17,143
Transport Refrigeration Units	~~50,469~~59,804
High-GWP Refrigerants	19,180
Aircraft	175
Total Operational Emissions	**~~175,118~~301,609**
Amortized Construction Emissions[1]	~~3,654~~5,012
Total Annual Proposed Project Emissions[2]	**~~178,772~~306,621**
Project GHG Efficiency (emissions per service population)[3]	**~~11.76~~20.44**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; yr = year
Totals may not appear to add exactly due to rounding.
1 Construction emissions were amortized over 30 years, which is the assumed lifetime of the proposed project. See Table 3.7-1 for detailed construction GHG emissions.
2 The proposed project's total annual emissions include annual operational emissions added with construction emissions amortized over 30 years.
3 The proposed project is anticipated to provide approximately 14,000 to 15,000 jobs at full buildout.
Source: AECOM 2016

Response to Comment 8-3

The listed threshold of significance for toxic air contaminants has been revised to reflect the current Air District threshold of 20 in one million. The relevant analysis reflects compliance with the District threshold. This does not change the findings, conclusions, or mitigation measures in the Draft EIR. The following change is reflected on page 3.2-23, Table 3.2-6, of the Draft EIR. Please see also Chapter 3 of this Final EIR, "Errata."

4. Toxic Air Contaminants

Table 3.2-6 Thresholds of Significance for Toxic Air Contaminants	
Carcinogens	Maximally Exposed Individual risk **equals or exceeds ~~10~~20 in one million**
Non-carcinogens	**Acute:** Hazard Index **equals or exceeds 1** for the Maximally Exposed Individual
	Chronic: Hazard Index **equals or exceeds 1** for the Maximally Exposed Individual

Notes: Carcinogenic (cancer) risk is expressed as cancer cases per one million. Non-carcinogenic (acute and chronic) hazard indices (HI) are expressed as a ratio of expected exposure levels to acceptable exposure levels.
Source: SJVAPCD 2015

Response to Comment 8-4

As requested, Mitigation Measure 3.2-1a has been split into two separate mitigation measures, Mitigation Measure 3.2-1a and 3.2-1b, which now read as follows:

> Mitigation Measure 3.2-1a: Comply with Current ISR.
>
> As applicable, based on the project size thresholds specified in Rule 9510 (Indirect Source Review), projects within the Specific Plan Area shall comply with District Rule 9510 Indirect Source Review (ISR).
>
> **Implementation:** Leaseholder/developer/contractors.
>
> **Timing:** Demonstrate compliance prior to issuance of building permit.
>
> **Enforcement:** SJVAPCD.
>
> Mitigation Measure 3.2-1b: Use Current Phase Equipment for All Construction Equipment.
>
> Site developers/leaseholders/project applicants who wish to develop facilities in the Specific Plan Area provide for County review and approval a proposed inventory of equipment for development within the Specific Plan Area that demonstrates use of current phase construction equipment (currently Tier 4).
>
> **Implementation:** Leaseholder/developer/contractors.
>
> **Timing:** Demonstrate compliance prior to issuance of building permit.
>
> **Enforcement:** Stanislaus County.

Mitigation Measure 3.2-1b has also been renamed Mitigation Measure 3.2-1c due to the addition of the new Mitigation Measure 3.2-1b. See also Chapter 3 of this Final EIR, "Errata."

Response to Comment 8-5

Following adoption of the Specific Plan and this EIR, the County will review all applications for development projects within the Plan Area for consistency and compliance with the Specific Plan and any other applicable County regulations in effect at the time of development. The Mitigation Monitoring and Reporting Program (MMRP) will be used by County staff to ensure compliance with adopted mitigation measures during project implementation.

The County will review future development proposals to determine whether they are within the scope of the EIR. At that time, the County will determine whether any additional environmental analysis required for future proposals.

Response to Comment 8-6

The discussion under Impact 3.2-3 (pages 3.2-34 through 3.2-38 of the Draft EIR) related to the exposure of sensitive receptors to emissions of toxic air contaminants, includes analysis of potential health risks to sensitive receptors from both construction and operational activities that could emit TACs. Because there are sensitive receptors in the vicinity of the project site that could be exposed to the total proposed project's construction-related TAC emissions and due to the unknown nature of construction emissions at the time of analysis for the Draft EIR, it is conservatively assumed that construction activities could potentially expose receptors to substantial TAC concentrations. Similarly, for operational considerations, because of the potential variability in land uses and intensity of uses within the project site, it is conservatively assumed that the proposed project's operational activities could generate substantial TAC emissions that would expose nearby sensitive receptors to substantial TAC concentrations.

Mitigation Measures 3.2-3a, 3.2-3b, and 3.2-3c are identified in the EIR to minimize potential exposure of sensitive receptors to TACs during construction and operational activities. Mitigation Measure 3.2-3a would ensure the use of current phase construction equipment (currently Tier 4) for all development within the Specific Plan Area and off-site construction. Tier 4 equipment exhaust standards have reduced the emissions rates from off-road engines so that they are similar to on-road heavy duty diesel engines, thereby significantly reducing construction-related emissions. Mitigation Measure 3.2-3b ensures that projects proposed within 1,000 feet of an existing daycare use or an off-site sensitive use shall be required to analyze and report on potential health risk impacts of particulate matter with aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) and TAC concentrations from long-term operations prior to the issuance of a building permit for new construction, tenant improvement, or change of use. If health risk impacts are determined to exceed Air District thresholds of significance under any potential operational exposure scenario, projects shall implement Mitigation Measure 3.2-3c, identification and implementation of strategies to reduce impacts below applicable Air District thresholds of significance (clearly identified as the mitigation measure's performance standard).

The EIR concludes that Impact 3.2-3 is a potentially significant impact, and identifies Mitigation Measures 3.2-3a, 3.2-3b, and 3.2-3c, which are consistent with the commenter's suggestion to further review potential health risks when approving future projects within the Specific Plan Area.

Please refer also to the Responses to Comments 6-34 and 6-47.

Response to Comment 8-7

Analysis of Impact 3.2-1 (pages 3.2-23 through 3.2-32 of the EIR), *Generation of short-term construction and long-term operational emissions*, acknowledges that any applicant proposing a project within the Specific Plan Area that meets the specified threshold requirements will need to demonstrate compliance with District Rule 9510 as a condition of discretionary approval. The discussion on Draft EIR pages 3.2-25 and 3.2-26 describes the requirements that would need to be met with regard to compliance with Rule 9510. To ensure such compliance is met, Mitigation Measure 3.2-1a requires that all projects that meet the threshold requirements for applicability of Rule 9510 shall comply with Air District Rule 9510 prior to the issuance of a building permit. This mitigation measure would be enforceable by the Air District.

The County's process is to condition a project to require an Air Impact Analysis, as required under Rule 9510, and to have this analysis submitted, reviewed, and accepted by the SJVAPCD prior to the initiation of any development. As discussed above, Mitigation Measure 3.2-1a requires compliance with Rule 9510, which would requires preparation of an Air Impact Analysis, prior to the issuance of a building permit. Sections 5.2.4 and 5.2.6 of the Specific Plan provide guidance that reviews require compliance with all applicable standards and regulations, including mitigation measures.

The of the EIR concludes that Impact 3.2-1 is a potentially significant impact, and identifies Mitigation Measure 3.2-1a, which is consistent with the commenter's statement that compliance with Rule 9510 is required for applicable projects no later than applying for final discretionary approval.

Response to Comment 8-8

As described in Section 3.2.2 (page 3.2-13 of the EIR), *Regulatory Framework,* all projects are subject to applicable Air District Rules and Regulations in effect at the time of construction. The rules and regulations specifically applicable to impact analyses are identified throughout the impact discussions of the Air Quality analysis.

Response to Comment 8-9

Objective 2 of the Specific Plan is to "Create a regional employment center on the former Crows Landing Air Facility property, conveyed to Stanislaus County through Public Law 106-82, that will promote development and reduce greenhouse gas emissions by bringing jobs closer to County residents." By increasing employment in proximity to housing, the proposed locally based job center is intended to reduce commute distances for County and Northern San Joaquin Valley residents and promote air quality improvements through reductions in vehicle miles traveled (VMT) (see Draft EIR, page 3.2-29).

Alternative modes of transportation are also promoted through elements of the Specific Plan. Section 3.3.1, *Circulation Framework*, of the Specific Plan describes the bicycle facilities and connectivity to SR 33, which is designated by the Stanislaus Council of Governments Non-Motorized Transportation Master Plan as a Class 3.5 bikeway or signed bicycle route with wide shoulders. Section 4.2.4, *Transportation Demand Management*, of the Specific Plan also describes the Transportation Demand Management (TDM) program that will be required for the businesses operating within the Specific Plan Area, Participation in the TDM program by the businesses operating in the Specific Plan Area will be mandatory, thereby resulting in greater use of alternative modes of transportation (rather than use of single occupant vehicles) for commuting to work and promoting overall more sustainable transportation modes within the Specific Plan Area and surrounding community. This program is specifically identified as Transportation Policy TP 11 of the Specific Plan.

In addition, Impact 3.2-1 requires implementation of Mitigation Measure 3.2-1b, *Reduce the Single Occupant Vehicle Commute*, (relabeled as Mitigation Measure 3.2-1c in the Final EIR) to reduce operational air quality impacts. This mitigation measure requires implementation of Policy Six of the Stanislaus County General Plan, which includes strategies to reduce vehicle trips and VMT, and therefore operational mobile emissions. To further reduce mobile source emissions, Mitigation Measure 3.2-1d, shown below, was added to the EIR. This mitigation measure requires the County to consult with local transit provider/s to promote transit to the workplace through appropriate placement and design of transit stops and expansion of services, such as park and ride lots, as appropriate. Please see also Chapter 3 of this Final EIR, "Errata."

Mitigation Measure 3.2-1d: Provide Transit to the Workplace.

- The County shall ensure that the placement and design of transit stops can accommodate public transit for employees and patrons. The County shall identify locations to expand services, including park and ride lots, to enable and encourage the use of transit to the workplace within the Crows Landing Specific Plan Area. The placement and design of transit stops within the Specific Plan Area shall be approved by the Stanislaus County Public Works Department based on generally accepted transit planning principles.

- The County shall ensure on-demand transit service to the Specific Plan Area once employment generating uses are established within the Specific Plan Area and fixed transit service upon completion of Phase 2.

- The overall operational air pollutant emissions mitigation performance standard is established by the San Joaquin Valley Air Pollution Control District through Rule 9510, the Indirect Source Rule, requiring applicable projects to achieve a minimum reduction of 33.3 percent of operational baseline NO_X emissions over a period of 10 years and a minimum reduction of 50 percent of operational PM_{10} emissions over a period of 10 years. Transit to the Specific Plan Area shall be established, monitored, and adjusted, if necessary, to contribute to this overall operational air pollutant emissions mitigation performance standard.

Implementation: Stanislaus County.

Timing: Upon operation of employment-generating uses for on-demand transit and fixed transit service upon completion of Phase 2.

Enforcement: Stanislaus County.

As explained in the discussion of Impact 3.2-1, the project is intended to provide air quality and greenhouse gas emissions benefits by reducing the amount of commute-related VMT by Stanislaus County residents who would choose to work in the Specific Plan Area instead of more distant locations and by accommodating the use of transit, it is not possible to quantify these benefits for the purposes of the transportation, energy, greenhouse gas emissions, or air quality analysis presented in the EIR. Household decisions related to housing location have to do with the employment locations of potentially multiple members of each household, the cost of housing, the cost of transportation, school districts, and other factors over which the County exercises little or no influence. Therefore, the operational air pollutant emissions results presented within the EIR would tend to overestimate the actual impact of the Specific Plan. The above described elements of the Specific Plan are anticipated to reduce actual VMT, but in order to maintain a more conservative analysis, these elements were not considered for the purposes of quantifying air pollutant emissions within the EIR; therefore, this impact will remain significant and unavoidable. No change has been made to the EIR.

Response to Comment 8-10

Mitigation Measure 3.2-1a has been revised to mention the potential to use a VERA to reduce emissions, as shown below and in Chapter 3 of this Final EIR, "Errata."

Mitigation Measure 3.2-1a: Comply with Current ISR ~~and Use Current Phase Equipment for All Construction Equipment~~.

As applicable, based on the project size thresholds specified in Rule 9510 (Indirect Source Review), projects within the Specific Plan Area shall comply with SJVAPCD's Rule 9510 Indirect Source Review (ISR) and reduce criteria air pollutant emissions consistent with SJVAPCD performance standards through feasible on-site strategies and, if necessary, feasible payment of off-site mitigation fees to SJVAPCD through a voluntary emission reduction agreement (VERA) or other appropriate mechanism. ~~Site developers/leaseholders/project applicants who wish to develop facilities in the Specific Plan area shall construct all facilities using current phase construction equipment (currently Tier 4).~~

Implementation: Leaseholder/developer/contractors.

Timing: Demonstrate compliance prior to issuance of building permit.

Enforcement: ~~Stanislaus County and~~ SJVAPCD.

Response to Comment 8-11

Following adoption of the Specific Plan, all applications for proposed development projects within the Specific Plan Area will be reviewed for consistency and compliance with the Specific Plan, and subject to the review and entitlement processes in section 5.2.4 of the Specific Plan, and any other County regulations in effect at the time of development.

Future development will require compliance with all applicable design and development standards, as detailed in Appendix B of the Specific Plan, as well as all other regulations required for issuance of a building permit. All of the commenter's recommendations are covered by the County application forms, which are also provided to responsible agencies as part of the standard referral and consultation process for discretionary permits. In the case of an Air Impact Assessment, please see response to Comment 8-7.

This page intentionally left blank.

2.3.9 LETTER 9, CALIFORNIA DEPARTMENT OF TRANSPORTATION, DATED MARCH 7, 2018

Letter 9

Rachel Wyse - FW: Crows Landing Industrial Business Park, State Clearinghouse No. 2014102035

From: "Jaramillo-Landeros, Janet"
To: "Rachel Wyse, state.clearinghouse"
Date: 3/7/2018 3:58 PM
Subject: FW: Crows Landing Industrial Business Park, State Clearinghouse No. 2014102035
Attachments: D10 Planning_20180307_154825.pdf

Good afternoon,

Please find attached Caltrans, District 10, comment letter regarding the above reference subject.

Thank you,

Janet

JANET P. JARAMILLO

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

District 10 – Planning Department
Office of Metropolitan Planning

DEPARTMENT OF TRANSPORTATION

N

Serious Drought!
Help save water!

March 7, 2018

10-STA-33-PM 6.730 – 010.230
10-STA-5-PM 010.568 – 010.876
Crows Landing Industrial Business Park
State Clearinghouse No. 2014102035

Rachel Wyse
Stanislaus County Planning &
Community Development Center

Dear Ms. Wyse:

The California Department of Transportation (Caltrans) appreciates the opportunity to have reviewed the Draft Crows Landing Industrial Business Park Specific Plan Environmental Impact Report (EIR), dated January 2018, and prepared by AECOM. The proposed project is a request to adopt a Specific Plan allowing for the development of a 1,528 acre project site to support a mix of aviation-compatible industrial and business park uses, general aviation, aviation-related land uses, public facilities, a multimodal (bicycle/pedestrian) transportation corridor and supportive infrastructure. The project is anticipated to develop in three phases over 30-years. Caltrans has the following comments: 9-1

1. The projects within the Crows Landing Industrial park area may cause a significant impact to State Routes. As the proposed planned projects within the influence area of the State Highway System (SHS) move forward, a traffic analysis for this development will be required. Please refer to the "Guide for the Preparation of Traffic Impact Studies (TIS)" developed by Caltrans, in order to determine impacts and mitigations to the affected SHS. Please provide this TIS for Traffic Operations to review. 9-2

2. The Traffic and Transportation Section 3.14 of the Crows Landing EIR page 3.14-16, indicates that mitigation for the industrial park would be to signalize the following intersections: 9-3

   a) Sperry Avenue / State Route 33
   b) West Ike Crow Road / State Route 33
   c) Fink Road / State Route 33
   d) Marshall Road / State Route 33

"Caltrans improves mobility across California"

All of these intersections will have an impact on opening day to the SHS; therefore, the mitigations to the State Highway will need to be in place prior to opening day. Fair share for the intersection when the existing plus project condition is when the LOS degrades is not acceptable. These need to be mitigated prior to opening day. 9-3 Cont'd

Were there other improvements considered rather than a signal? Please provide the other improvements considered for a review. Please provide the signal warrant analysis for all of the intersections that a signal is recommended as mitigation. 9-4

This section goes on to say this is less than significant with mitigation; therefore, the mitigations will need to be made. The impact is a direct impact from the industrial park to the intersections that require mitigation. 9-5

We look forward to continuing to work with you in a cooperative manner. If you have any questions, please contact Janet P. Jaramillo or myself

Sincerely,

Janet P. Jaramillo

-for- TOM DUMAS, Chief
Office of Metropolitan Planning

c: Scott Morgan, State Clearinghouse

"Caltrans improves mobility across California"

RESPONSE TO COMMENT LETTER 9 – CALIFORNIA DEPARTMENT OF TRANSPORTATION, DISTRICT 10

Response to Comment 9-1

The County appreciates the commenter's review of the Draft EIR. The comment is noted and no further response is required.

Response to Comment 9-2

The *Transportation Infrastructure Master Plan, Crows Landing Industrial Park,* dated October 13, 2017, and the Draft EIR both describe the methodology for the transportation analysis. The study provides a comprehensive analysis of State Route 33 and Interstate 5 and its interchanges that are affected by the project, including mitigation requirements. As noted in the Draft EIR and noticing for the Draft EIR, the Transportation Infrastructure Plan is under separate cover and on file with the County Planning and Community Development Department.

Response to Comment 9-3

None of the intersections listed in Comment 9-3 meet signal warrants on opening day. Based on the County's experience, Caltrans traffic operations personnel typically refuse to allow installation of traffic signals that do not meet established signal warrants. Given the scale of the Specific Plan, it would not be appropriate to install signals at initiation of project construction. The first phase of the project generates over 19,000 daily trips. Instead, the improvements will be phased to be constructed when signal warrants are met. When the signals are nearing meeting traffic signal warrants, the County will initiate efforts to design and install such signals, subject to approval of Caltrans.

Response to Comment 9-4

As noted in the Transportation Infrastructure Plan, when traffic signal warrants are met, the agencies involved in each intersection, including Caltrans, will determine whether a traffic signal or a warrant is most appropriate to satisfy mitigation requirements. TJKM used the California Manual on Uniform Traffic Control Devices peak-hour signal warrants to evaluate the need for signals. For information regarding methodology, calculations, and criteria by jurisdiction, please refer to the revised Transportation Infrastructure Plan, which is Appendix A to this Final EIR. This document evaluate signal warrants under both near-term and 2035 conditions and evaluates under which of three project phases the signals will likely meet the signal warrants. County Traffic Engineering, in coordination with Caltrans Traffic Operations, will prepare the future traffic operation analysis, as described in Mitigation Measure 3.14-1 necessary to determine when improvements that are attributable to the Specific Plan require mitigation.

Response to Comment 9-5

Please see Responses to Comments 9-3 and 9-4.

2.3.10 LETTER 10, SIERRA ACADEMY OF AERONAUTICS, DATED MARCH 9, 2018

Letter 10

SIERRA

Robert Deklinski, Director of Business Operations
Sierra Academy of Aeronautics
Castle Airport

March 9, 2018

Stanislaus County
Planning and Community Development Department
Rachel Wyse, Senior Planner

To whom it may concern,

On behalf of Sierra Academy of Aeronautics, which is located at Castle Airport, in Atwater, California, I would like to express my support for the development of the Crows Landing Industrial Business Park project and especially its runway restoration and airport development plans.

Sierra Academy is an international flight school that began its operations in 1964, and conducts an average of 80,000 flight operations per year. For over 50 years, our mission has been to train the next generation of commercial airline pilots by providing quality, ab-initio training in a safe, efficient and professional manner. With that in mind, we proudly trained a student population consisting of both domestic and international students from around the world. 10-1

Due to the high volume of operations being conducted at Castle Airport we consistently have a need to use other General Aviation (GA) airports in the area to conduct flight operations; therefore, we would wholeheartedly support and gladly partner with the Planning and Community Development team of Stanislaus county.

Though Sierra is in the adjoining county of Merced the ability to use Crows Landing Airport for our landing and takeoff operations as well as possible future stationing of aircraft would greatly enhance Sierra's operational capabilities, as well as increase its student body size.

On behalf of Sierra Academy of Aeronautics, please accept our full endorsement for the development of the Crows Landing project.

Robert Deklinski

Robert Deklinski
Director of Business Operations

SIERRA ACADEMY OF AERONAUTICS – INTERNATIONAL TRAINING CENTER
2305 Jetlin Drive, Atwater, California 95301 USA
PHONE (209) 722-7522 EMAIL officemgr@sierraacademy.com WEBSITE sierraacademy.com

Response to Comment Letter 10 – Sierra Academy of Aeronautics

Response to Comment 10-1

The commenter's support for the project is acknowledged.

2.3.11 LETTER 11, STANISLAUS COUNTY ENVIRONMENTAL REVIEW COMMITTEE, DATED MARCH 9, 2018

Letter 11

CHIEF EXECUTIVE OFFICE

Jody L. Hayes
Chief Executive Officer

Patricia Hill Thomas
Chief Operations Officer/
Assistant Executive Officer

Keith D. Boggs
Assistant Executive Officer

Patrice M. Dietrich
Assistant Executive Officer

STANISLAUS COUNTY ENVIRONMENTAL REVIEW COMMITTEE

March 9, 2018

Rachel Wyse, Senior Planner
Stanislaus County Planning and Community Development

SUBJECT: ENVIRONMENTAL REFERRAL – CROWS LANDING INDUSTRIAL BUSINESS PARK – PUBLIC NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)

Ms. Wyse:

Thank you for the opportunity to review the above-referenced project.

The Stanislaus County Environmental Review Committee (ERC) has reviewed the subject project and has no comments at this time. 11-1

The ERC appreciates the opportunity to comment on this project.

Sincerely,

Patrick Cavanah

Patrick Cavanah
Sr. Management Consultant
Environmental Review Committee

RECEIVED
MAR 12 2018
STANISLAUS CO. PLANNING & COMMUNITY DEVELOPMENT DEPT.

PC:ss

cc: ERC Members

STRIVING TOGETHER TO BE THE BEST!

RESPONSE TO COMMENT LETTER 11 – STANISLAUS COUNTY ENVIRONMENTAL REVIEW COMMITTEE

Response to Comment 11-1

The County appreciates the commenter's review of the Draft EIR.

2.3.12 LETTER 12, CITY OF MODESTO, DATED MARCH 23, 2018

Letter 12

CITY OF
MODESTO
CALIFORNIA

City of Modesto
Community and Economic
Development Department/Planning Division

March 23, 2018

Angela Freitas, Director
County of Stanislaus Community Development

RE: Crows Landing Industrial Business Park, PLN-2013-091 (PRR-18-001)

Dear Angela:

Thank you for providing the City of Modesto with the opportunity to review the Crows Landing Industrial Business Park Draft EIR. We offer the following broad comment related to potentially significant traffic impacts to City roadways.

The Draft EIR estimates that there would be a total of 14,447 employees when the specific plan is developed. These employees would come from the surrounding communities. Modesto's population is approximately 47 percent of the County total, and approximately 40 percent of the future project employees could reasonably be expected to live in Modesto – approximately 5,779 employees. Using this assumption, Modesto's share of the 52,422 daily, 5,653 am peak and 6,345 pm peak hour trips would be approximately 20,969 daily, 2,261 am peak, and 2,538 pm peak hour trips. 12-1

Staff estimates the trip distribution of Modesto-based project employees would result in approximately 75 percent of trips using Crows Landing Road for at least part of the trip, approximately 15 percent of trips using Carpenter Road, and approximately 15 percent of trips using Mitchell Road. Some trips would shift between routes along the journey.

Due to the significant trip generation and associated peak-hour traffic volumes, traffic impacts should be analyzed at the SR99 / Crows Landing Road interchange and at the intersections of Crows Landing Road / Hatch Road, Crows Landing Road / Whitmore Avenue, Mitchell Road / Yosemite Boulevard, Carpenter Road / Paradise Road, Carpenter Road / Hatch Road, and on the segments of Crows Landing Road from the SR99 northbound on- and off-ramps to Whitmore Avenue for each phase of the project and for the cumulative conditions. 12-2

The City of Modesto General Plan is being amended now. Crows Landing Road will be designated as a four-lane minor arterial. The EIR traffic analysis should assume a four-lane Crows Landing Road at the buildout / cumulative scenario. 12-3

The City of Ceres West Landing Specific Plan area is located along Crows Landing Rd. The Specific Plan covers 960 acres of regional commercial, community commercial, light industrial, offices, and residential developments. The cumulative, or "buildout," scenario analysis in the Draft EIR should assume that all 960 acres are developed consistent with the Specific Plan. 12-4

Should you have any questions regarding the above comments, please contact me

Regards,

Patrick Kelly

Patrick Kelly, AICP
Planning Manager

Response to Comment Letter 12 – City of Modesto

Response to Comment 12-1

Based on project records, projected Specific Plan daily trips at the City Limits near Whitmore Avenue are 4,600 vehicle trips per day (vpd) on Carpenter Road and 1,600 vpd on Crows Landing Road. Together, these trips constitute about 12.6 percent of all non-internal project trips. See Appendix D of this Final EIR.

The traffic model shows that the intersection of West Main Avenue and South Carpenter Road, which is in the County's Public Facilities Fees/Regional Transportation Impact Fee Program (PFF/RTIF), will need to be improved. The project will pay its fair share via the PFF/RTIF program. The County will design and construct this improvement via this impact fee program. Near-term project traffic does not require widening of either Crows Landing or Carpenter Road within Modesto city limits. Mitchell Road is more than 22 miles away from the Specific Plan Area and therefore beyond the scope of the County's study area for the Specific Plan EIR, as Specific Plan-related traffic will not appreciably affect this facility.

Response to Comment 12-2

The estimated buildout average daily traffic (ADT) on Carpenter Road is 23,000 vehicles per day (vpd) near the southern City limits, based on current volumes and a 1.15-percent annual growth rate. In this instance, the Specific Plan daily volumes constitute 20 percent of the future link volumes near the Hatch Road/ Carpenter Road intersection. It should be noted that these volumes are primarily employee-related trips drawn from existing and future Modesto area residents. In that sense, they are primarily redirected, rather than new trips.

On Crows Landing Road, based on a 2018 traffic study of the Crows Landing Road corridor between Hatch Road and Whitmore Avenue, the daily buildout traffic volumes will be 19,300 vpd south of Whitmore Avenue, where the Specific Plan will generate about 1,600 vpd, or about 8.3 percent of the total. See Appendix H of this Final EIR, which is the Crows Landing Corridor Study. On Crows Landing Road north of Hatch Road, the future estimated ADT is 31,620 vpd and the Specific Plan contributes about 1,100 vpd, or about 3.4 percent of the total. Near the Crows Landing Road/SR 99 interchange, the volumes on Crows Landing Road increase slightly and the project volumes decrease slightly. At the interchange, it is estimated that the Specific Plan traffic volumes will constitute no more than 3.4 percent of the total. An effort is being made to start a cooperative PSR/PID for this interchange with Caltrans, the City of Modesto, and the City of Ceres.

Mitchell Road will not be heavily used by Specific Plan traffic. About 350 vpd are expected to use the intersection of Mitchell Road and Whitmore Road, which is estimated to constitute less than 2 percent of the future traffic. At Mitchell Road and Yosemite Boulevard, the Specific Plan contribution is estimated to be less than 1 percent.

Response to Comment 12-3

Please see the Response to Comment to 12-2, which is based on analysis that assumes a four-lane Crows Landing Road.

Response to Comment 12-4

Section 5.1, "Cumulative Impacts," in Chapter 5, "Other CEQA," of the Draft EIR describes the Cumulative plus Project Conditions scenario. The Tri-County Traffic Model was used in the analysis for travel demand forecasts. The model geographically covers the counties of San Joaquin, Stanislaus, and Merced. It was developed by the San Joaquin Council of Governments (SJCOG) and recalibrated so that it closely replicates existing conditions. In addition, three new traffic analysis zones (TAZs) were developed for the vicinity of the Specific Plan Area, loaded with the ITE trip generation into the model for trip distribution and assignment. The model integrates the network and land use information from the StanCOG model, the SJCOG travel demand forecasting model, and the Merced County Association of Governments (MCAG) travel demand forecasting model. The combined model provides adequate coverage of the study area, extending from Tracy-Stockton to the north to Los Banos to the south. Therefore, this methodology provides a comprehensive forecast for the analysis of Cumulative plus Project Conditions, including, as appropriate, land use change in Ceres, as well as other locations in Stanislaus, San Joaquin, and Merced counties.

2.3.13 LETTER 13, DEL PUERTO HEALTH CARE DISTRICT, DATED APRIL 17, 2018

Letter 13

DEL PUERTO
Health Care District

April 17, 2018

Rachel Wyse
Senior Planner
Dept. of Planning & Community Development
Stanislaus County

Subject: **Draft Environmental Impact Report (DEIR) for the Proposed Crows Landing Industrial Business Park Project SCH No. 2014102035**

Dear Ms. Wyse:

The Del Puerto Health Care District, dba Del Puerto Health Center and Patterson District Ambulance, (hereinafter referred to as the "District") has reviewed the DEIR referenced above to evaluate the responses to the questions and concerns we raised in our correspondence to Stanislaus County dated November 12, 2014. It appears that the project has now been defined in better terms according to the guiding principles outlined in the draft Specific Plan dated January of 2018. The project as proposed could generate 14,447 new jobs and nearly 14.2 million square feet of new industrial development. This creates a tremendous workforce population of primary workers as well as workers associated with support services. The planned area workforce will need the emergency services of Del Puerto Health Care District in the future and providing appropriate emergency services is of the utmost concern of the District. We are appreciative of the designation of nearly 68 acres of the 1,274 acre project site for Public Facilities such as fire suppression, law enforcement and other emergency services. I suspect the details of this arrangement will be worked out between the County and the District in the future. The purpose of this letter is to provide Stanislaus County comments on the above-mentioned DEIR. 13-1

The District, located in the western portion of Stanislaus County, was established in 1946 to provide health care services to residents and employees living in the City of Patterson and unincorporated areas within western Stanislaus County. District services are also available to residents/patients living or working in the greater service area, including the Cities of Gustine and Newman. In its current form, the District provides primary care and routine medical services, as well as emergency medical services (EMS). The proposed Crows Landing Industrial Business Park Project is located within the District's service boundary and the Exclusive Operating Area (EOA) of the District's ambulance service. 13-2

The District's Mission Statement is as follows; "The District's primary mission is to provide the highest quality service through Patterson District Ambulance and Del Puerto Health Center, while expanding the healthcare availability to the citizens of the Del Puerto Health Care District." Because the proposed Crows Landing Industrial Business Park Project is within the District's service boundary, it is our goal to work with the County (and any future Project Proponent) to ensure the above Mission Statement is executed with the highest quality service to the future employees and potential future residents generated as a direct result of the Crows Landing Industrial Business Park Project. 13-2 Cont'd

In general, based on our review of the DEIR, it is our understanding the proposed Crows Landing Industrial Business Park Project is comprised of site development over three phases of construction and will include the following:

Phase 1 *(2016-2025)*

- Revitalization of the former military runway (Runway 11-29) to a General Aviation (GA) Airport
- Promoting the reuse of the State Route (SR) 33 Corridor and Public Facility areas northeast of the proposed airport
- On and off-site infrastructure improvements, including roadway and public facility upgrades

13-3

Phase 2 *(2026-2035)*

- Development of additional facilities in SR 33 Corridor, north of the proposed GA Airport
- Additional infrastructure and roadway improvements, in support of Phase 2 development

Phase 3 *(2036-2045)*

- Development of two areas located south of the Crows Landing Airport, identified as the Fink Road Corridor and the Bell Road Corridor

Based on the above project summary, the County has prepared a public review DEIR circulated January 22, 2018. In our review of the DEIR we anticipated the consideration of the broad environmental effects of adoption and implementation of the Project's General Plan Amendment, Specific Plan, Airport Land Use Compatibility Plan Amendment, Rezoning, Development Agreement, and off-site project Related Improvements. As such, the purpose of this letter is to provide the County with our comments as it relates to the DEIR presented for our review. Below, under each respective topic are items which still need to be addressed in the EIR process: 13-4

Hazards & Hazardous Materials Section 3.9 of the DEIR:

The EIR should evaluate the potential environmental impacts for hazardous material storage, disposal or transport within the proposed project and evaluate potential significant impacts created as a result of these hazardous materials on the surrounding environment. Special equipment, training and the like will need to be evaluated as a direct result of potential hazardous materials use within the project. Fire suppression systems, roadway circulation and land use patterns may influence the impacts in this regard based on the types of hazardous materials storage. The concern here is with future uses within the Business park rather than the concerns expressed with the ongoing remediation effort associated with the base closure. 13-5

Public Services Section 3.13 of the DEIR:

As noted previously, the proposed project is located within the boundary of the Del Puerto Health Care District. As such, the DEIR failed to evaluate the proposed projects potential effects on the District, as well as the potential need for expansion of District services and facilities as either a direct or indirect result of the proposed project. The District anticipates that implementation of the proposed project will 13-6

2 of 3

have a significant impact on the Emergency Medical Services of the District and potentially require the need for additional Health Care Facilities including medical staff, land and building facilities, and quite possible the expansion of other areas of medical service needed to allow the continued healthcare access to the residents in west Stanislaus County. In this regard, we are encouraged by the opportunity communicated in 2014 for a dedicated five (5) acre site in the project area. This land dedication could allow for the future location of both a satellite healthcare clinic and an ambulance sub-station if District financial conditions allow this expansion. Additional discussion needs to take place between the District and Stanislaus County to set forth the terms and conditions of this communication. 13-6 Cont'd

The District requested that the County and the preparers of the EIR consult and coordinate with District Staff in determining impacts and potential mitigation measures dealing with public services, and specifically, the impacts said project may have on the District's responsibility to provide medical care to residents within the District's boundary. The DEIR fails to address the concerns expressed above. 13-7

We further request that the County instruct their consulting team to modify Section 3.13 of the DEIR to add adopted language of the Land Use Element of the Stanislaus County General Plan Goal Four, Policy Twenty Four which states "Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, roads systems, schools, health care facilities, etc." and Implementation Measure 4 which states "the County shall continue to work with independent fire districts and health care districts to implement fees to help finance facilities to support their services". 13-8

Traffic and Circulation Section 3.14 of the DEIR:

As it relates to the County's Emergency Response Plan, the DEIR fails to evaluate the potential environmental impacts to the District's ability to provide emergency response to all areas of the proposed industrial project via the regional and local circulation network. Locations of the District's emergency services and health care facilities will need to be considered in exploring appropriate methods to adequately serve the proposed workforce. The DEIR must evaluate mandated response times established by the County and the distance of the proposed project to the location of existing District EMS facilities. The ability to meet mandated response times must not adversely affect District finances and existing service level demands. 13-9

On behalf of the Del Puerto Health Care District, thank you again for the opportunity to provide Stanislaus County with comments on the proposed Crows Landing Industrial Business Park Project DEIR. Should you have any questions, please do not hesitate to contact me

Sincerely,

Karin Hennings

Karin Hennings
Administrative Director/CEO
Del Puerto Health Care District

cc: John B. Anderson, President of JB Anderson Land Use Planning
Ken Irwin, City Manager, City of Patterson
Project File

3 of 3

Response to Comment Letter 13 – Del Puerto Health Care District

Response to Comment 13-1

The County appreciates the commenter's review of the Draft EIR.

Response to Comment 13-2

The County appreciates this background information on the District.

Response to Comment 13-3

The County acknowledges this summary of the main elements of the Specific Plan.

Response to Comment 13-4

Comments on specific topics provided by the District in this letter are addressed in the responses to Comments 13-5 through 13-9, below.

Response to Comment 13-5

Please see Responses to Comments 6-34 and 6-47.

The Specific Plan can accommodate a variety of land uses, including uses where it is possible that hazardous materials could be temporarily stored or transported. As discussed in detail in Draft EIR Chapter 2, "Project Description," (pp. 2-19 and 2-20), the County prepared a *Transportation Infrastructure Plan* to analyze circulation and access needs related to the development of the Specific Plan. The purpose of the analysis was to determine the transportation improvements that would be required to accommodate proposed development, including: the construction of on-site backbone and secondary streets; the reconstruction or widening of off-site two lane streets; additional off-site traffic signals; and Fink Road interchange improvements. On-site transportation improvements, such as the construction of backbone and secondary roads, would be constructed as part of the project to facilitate transportation needs that are appropriate to the proposed land uses. Planned roadway improvements are shown in Draft EIR Exhibit 3.14-2 in Section 3.14, "Traffic and Transportation" (page 3.14-14), and are discussed in detail on page 3.14-13 under the heading "Specific Plan Circulation System." As stated in the Draft EIR, new local industrial roads within the project site would typically have a 120-foot right-of-way with two travel lanes, one center-aligned left-turn lane, a parking lane, drainage swale, and sidewalk on each side. The northern portion of the local industrial road that intersects with the West Marshall Road entrance to the project site would require widening to accommodate four travel lanes. This cross section would maintain the 120-foot right-of-way and will consist of four travel lanes, one center-aligned left-turn lane, as well as paved shoulder, wide drainage swale, and sidewalk on each side. Most of the roadway improvements would have two lanes. For streets with greater traffic demands, a four-lane roadway with a median to accommodate left-turn lanes would be constructed. The transportation system ensures adequate access for operation of the uses in the Specific Plan, as well as emergency access.

Fire suppression systems that are required for specific types of land uses are governed by the federal Occupational Safety and Health Administration (OSHA) (29 Code of Federal Regulations [CFR] Part 1910); Cal/OSHA through the California Fire Code (CCR Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment)" (p. 3.13-2); the California Building Standards Code; and by local County permitting regulations. Draft EIR Section 3.13, "Public Services," describes the existing fire protection services in the vicinity of the Specific Plan Area (page 3.13-1). Draft EIR Impact 3.13-1 (pages 3.13-5 and 3.13-6) states that Specific Plan-related development will be required to comply with all California Fire Code (CFC) requirements. Facility designs will provide for fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, and hazardous materials storage and use. In addition, the County will require tenants to modify facility designs, when necessary, to ensure that buildings can provide adequate access for emergency vehicles. Building Permit applications for the Specific Plan Area will be referred to the Stanislaus County Fire Prevention Bureau and the West Stanislaus Fire Protection District for review. Conditions of approval identified by either the Fire Prevention Bureau or the West Stanislaus Fire Prevention District will be implemented through the building permit process. Individual tenants and/or site developers, as appropriate, will be responsible for incorporating all California Fire Code, County Fire Protection District, and West Stanislaus Fire District requirements into designs, and for paying the Fire Protection Facilities Fee as a condition of building permit approval. Furthermore, approximately 15 acres in the southernmost portion of the Public Facilities area located west of the intersection of Ike Crow Road and Bell Road have been designated as an appropriate location for the development of on-site fire and law enforcement facilities (in Phase 1). The implementation of these requirements would provide sufficient fire protection services and personnel to serve the Specific Plan.

Draft EIR Impact 3.9-1 (pp., 3.9-17 and 3.9-18) evaluates the potential for accidental spills and routine use and transport of hazardous materials. As explained on Draft EIR page 3.9-18, during project operations, any future businesses or public agency operations that handle hazardous materials are required by law to comply with federal, State, and local laws, regulations, and policies regarding the handling, storage, reporting, tracking, and cleanup (if any accidental spills occurred) of hazardous materials, including preparation of a hazardous materials business plan and disclosure of hazardous materials inventories.

The Stanislaus County Department of Environmental Resources (DER) is the Certified Unified Program Agency (CUPA) responsible for oversight of local businesses that handle hazardous materials. Any types of specialized equipment and training that may be necessary related to on-site use of hazardous materials is thoroughly regulated at the federal, State, and local level. Some of the numerous regulatory controls over hazardous materials are presented and discussed on Draft EIR pages 3.9-10 through 3.9-15. Construction contractors and future site operational users are required by law to implement and comply with existing hazardous material regulations. Each of these regulations is specifically designed to protect public health and safety through improved procedures for the handling of hazardous materials, better technology in the equipment used to transport these materials, and a more coordinated and quicker response to emergencies.

Please see also Master Response 1.

Response to Comment 13-6

Based on Appendix G of the CEQA Guidelines, an impact related to public services is considered significant if the proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives. Changes in service ratios, response time, and performance objectives are not, by themselves, physical environmental impacts on the environment. The Draft

EIR comprehensively analyzes reasonably foreseeable adverse physical environmental effects associated with the Specific Plan, including on- and off-site effects.

The Draft EIR presents a comprehensive assessment of reasonably foreseeable impacts of the Specific Plan, along with mitigation for all potentially significant and significant impacts. Chapter 3 examines the project-level impacts and Chapter 5 analyzes the cumulative impacts of Specific Plan impacts in combination with the impacts of past, current, and probable future plans and projects. The discussion of impacts in the EIR is organized by environmental topic area. For example, air quality effects are discussed in Section 3.2, biological resources effects are discussed in Section 3.4, and so forth. Throughout these environmental topic sections is an assessment of the project's direct effects a well as reasonably foreseeable indirect effects. Thus, the air quality analysis includes not only the direct impacts associated with construction equipment use during buildout of the Specific Plan Area, but also emissions associated with vehicles accessing the Specific Plan Area – deliveries, pickups, employees, visitors, and any other type of vehicular traffic attracted to the Specific Plan Area at full buildout. This is true for each environmental topic – direct and reasonably foreseeable indirect effects are addressed together within each environmental topic-specific section.

Regarding the commenter's suggestion that the County dedicate a five-acre site in the Specific Plan Area for a health clinic and an ambulance sub-station, the County will coordinate with the District and other service agencies and departments within the County, as the Specific Plan builds out, on the planning for emergency response, fire suppression, and law enforcement in the Specific Plan Area. The County appreciates the District's suggestion and will coordinate as the Specific Plan develops with this suggestion in mind.

Please see also Master Response 1.

Approximately 15 acres in the southernmost portion of the Public Facilities area located west of the intersection of Ike Crow Road and Bell Road have been designated in the Specific Plan as an appropriate location for the development of an on-site emergency services facility. Consistent with this designation of land within the Specific Plan Area, the County will continue to implement the following policy from the Land Use Element of the General Plan in collaboration with other service providers:

> POLICY THIRTY-ONE – The County shall support efforts to improve local health care options through the siting of new facilities in locations with the infrastructure (including, but not limited to, transportation and utility) to support both facility and client needs.

Also consistent with the designation of land for public services in the Specific Plan Area and the extensive infrastructure master planning and financing in the Specific Plan, the County will continue to follow the following General Plan guidance throughout implementation of the Specific Plan:

> POLICY TWENTY-FOUR – Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, road systems, schools, health care facilities, etc.

> IMPLEMENTATION MEASURE 4 – The County shall continue to work with independent fire districts and health care districts to implement fees to help finance public facilities to support their services.

Physical impacts associated with construction and operation of emergency service facilities are evaluated in the other sections of this the Draft EIR. There are no additional reasonably foreseeable significant impacts associated with construction of on-site facilities beyond those comprehensively considered throughout the other sections of the Draft EIR.

However, regarding the suggestion of a dedicated five (5) acre site in the Specific Plan Area for a health clinic and an ambulance sub-station, the County appreciates the District's suggestion and will coordinate as the Specific Plan develops with this suggestion in mind.

The County understands that, in 2008, it was determined that the Health Center was out of room. Instead of seeking additional space, the District decided to purchase or construct a building for specialists, additional providers, and ancillary services (Stanislaus LAFCO 2013). In 2012, the District relocated administrative offices and the Health Center to a newly remodeled, 11,000 square foot building in the Keystone Business Park in Patterson (Stanislaus LAFCO 2015). A District Fee Study estimated a service population within the District of 22,189 persons in 2005 with a projected service population of 55,511 in 2020. The County understands that the District is funded through a share of the County property tax revenues, special assessments, health center revenues, ambulance service fees, developer/mitigation fees collected from new development, and interest income.

Response to Comment 13-7

Please see Response to Comment 13-6 and Master Response 1. The County invited early input via an Agency and Stakeholder Coordination Meeting on February 5, 2014, attended by Richard Nakamura, District CEO prior to preparation of the Specific Plan and EIR.

As stated in the response to Comment 13-6, above, based on Appendix G of the CEQA Guidelines, an impact related to public services is considered significant if a proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives. Changes in service ratios, response time, and performance objectives or costs to provide services are not physical environmental impacts on the environment.

Please refer also to the Response to Comment 13-6.

The County initiated meetings to gather input from the District and other agencies and interested individuals, including, but not limited to the following:

- **Future Strategies Sessions (often referred to as fingerprint meetings)**
  - 2013, October & November
- **Agency & Stakeholder Meetings**
  - 2014, January & February
- **Notice of Preparation**

- October 13 – November 13, 2014

► **Scoping Meetings**

- October 23, 2014 – Patterson
- October 30, 2014 – Crows Landing

Response to Comment 13-8

Please see Responses to Comments 13-6 and 13-7 and Master Response 1.

See page 3.13-3 of the Draft EIR, which includes the referenced policy language for County General Plan, Land Use Element Policy Twenty-Four. See Chapter 3 of this Final EIR, which shows the addition of Specific Plan Policy Thirty-One and Implementation Measure 4, as well. These revisions do change the analysis in or conclusions of the Draft EIR.

Response to Comment 13-9

Please see Responses to Comments 13-6 and 13-7 and Master Response 1. Please refer to Section 3.14, "Traffic and Transportation," and Chapter 5, "Other CEQA," which evaluates the potential impacts of the Specific Plan related to level of service for existing and future local and regional roadway networks, and the Transportation Infrastructure Plan, which is provided for additional review as Appendix A to this Final EIR. Please see also Specific Plan Policy 2, Implementation Measures 12 regarding emergency response. Please see also pages 3.9-31 and 32, which address emergency access.

2.3.14 LETTER 14, CITY OF NEWMAN, DATED APRIL 24, 2018

April 24, 2018

Letter 14

Stanislaus County Planning and Community Development Department
c/o Rachel Wyse, Senior Planner

RE: Review and Comment on the Crows Landing Industrial Park DEIR

Dear Ms. Wyse:

Thank you for the opportunity to review the Draft Environmental Impact Report (DEIR) for the Crows Landing Industrial Park Specific Plan. The proposed project envisions industrial and distribution type uses and covers roughly 1,528 acres located about 6½ miles northwest of the City of Newman. 14-1

The City of Newman reviewed the DEIR with the intent of considering: 14-2

- Conversion of agricultural land and potential housing need impacts
- How the City of Newman's circulation system is considered in the analysis.
- What impacts to the City of Newman Sphere of Influence are identified.
- What mitigation measures are identified to address impacts within the City of Newman.
- Does the document address the topic of circulation and transportation in a manner that is adequate under the California Environmental Quality Act (CEQA) and standard engineering practice.

AGRICULTURE

The Draft EIR identifies several policies that both the County and Stanislaus County Local Agency Formation Commission ("LAFCO") have adopted to ensure that any conversion of agricultural land to urban use is mitigated through their entitlement processes. The Draft EIR then asserts that there is either no feasible mitigation measure for these types of impacts from this Project or that the impacts to agricultural resources are less than significant.[1] However, both the County's own requirements and LAFCO's policies provide mitigation measures that could address impacts from the Project, but are not applied in the Draft EIR. In addition, agricultural mitigation has been recognized as feasible mitigation to address environmental impacts related to the loss of farmland under CEQA. Stanislaus County, in fact, helped pioneer these obligations under CEQA. 14-3

However, because the Project does not involve residential development, the Draft EIR assumes that no mitigation is required for the Project.[2] The County is therefore exempting itself from addressing an impact of the Project that other public agencies, such as the City, will not be exempt when additional

[1] Draft EIR, Agricultural Resources, 3.3-17-19.

[2] Draft EIR, Agricultural Resources, 3.3-17.

residential development is required to serve the growth that results from the Project. The Draft EIR must be reconsidered in light of the existing requirements under CEQA for farmland mitigation. 14-3 Cont'd

Finally, the Draft EIR identifies the loss of 30.5 acres of agricultural land, 15.8 of which are Williamson Act land, as less than significant. In the analysis of this conversion, the Draft EIR relies on the idea that the Project will not "generate pressure to convert off-site agricultural use" to urban uses.[3] This analysis neglects the impact from the Project of attracting new residents to the County seeking employment opportunities. It is reasonably foreseeable that a Project that contemplates creating 14,000 to 15,000 new jobs will attract new residents to the County. This increase in residents will in turn require additional residential uses in the County, which will generate pressure to convert off-site agricultural uses to residential use. Therefore, impacts of the Project on agricultural uses are clearly not less than significant. 14-4

Action / Comments.

1. Based on the conversion of agricultural land as identified in the DEIR, the City requests that the impacts of the Project on agricultural uses be further analyzed and mitigated, as is the requirement for other public agencies. 14-5
2. Due to the Project's provision of new employment opportunities, additional housing will likely be necessary, if not required, by the State (i.e. RHNA). The City requests an analysis be included in the EIR to address said housing impacts. 14-6

<u>TRANSPORTATION</u>

<u>Background Information</u>
We reviewed the January 2018 DEIR's Traffic and Transportation Section (3.14) and the October 2017 Transportation Infrastructure Plan.

Study Area. We reviewed the study area limits to determine how roads within the Newman Sphere of influence were addressed. The study didn't address any intersections in Newman. The report did address SR 33 from Fink Road to Stuhr Road from Stuhr Road to "Newman". Because the Stanislaus County General Plan Circulation Element addresses SR 33 as far south as Jensen Road, we assumed that this is the southern limit of the segment ending at "Newman". The report didn't address any other roads that extend north from Stuhr Road, nor the I-5 / Stuhr Road interchange. 14-7

The Stanislaus County Circulation Element notes that State Route 33 is a Limited Access Control-Principal Arterial from Jensen Road north to Fink Road. State Route 33 within the Cities of Patterson and Newman is planned to be an 80-foot Minor Arterial, unless otherwise determined by Caltrans. 14-8

Existing Setting Thresholds. The Transportation Plan capacity analysis identified SR 33 as a "two lane undivided state road" capable of carrying an Average Daily Traffic (ADT) volume of 11,800 vehicles per day at LOS C and 20,000 ADT at LOS D, based on Stanislaus County Standards and Specifications Table 3-12. However, while this threshold is similar to the level included in the City of Newman's General Plan Circulation Element (i.e., 18,000 ADT at LOS D) review of Table 3-12 identifies lower Levels of Service thresholds based on vehicles/per day/per lane. Table 3-12 indicates the maximum volumes for a 2-lane road were 6,800 ADT at LOS C / 11,800 ADT at LOS D and 20,000 at LOS E, while in rural areas the thresholds are half of those totals. Thus, while the analysis appears to overstate the capacity of County roads, they were not too far off of what the City of Newman assumes on SR 33 in the community. 14-9

[3] Draft EIR, Agricultural Resources, 3.3-18.

Existing Setting Conditions. The DEIR notes that SR 33 from Fink Road to Stuhr Road and from Stuhr Road to "Newman" carries 5,123 ADT and 8,197 ADT respectively. These volumes indicate LOS C or better conditions under the thresholds presented. While no supporting traffic count information for either segments or intersections was included, these daily volumes are consistent with those reported by Caltrans, which published 2016 totals of 4,400 ADT and 8,400 ADT respectively. 14-10

The analysis doesn't speak to intersections on SR 33 through downtown Newman. The City's Northwest Newman Master Plan DEIR traffic study indicated that SR 33 / Stuhr Road operates at LOS B and the SR 33 / Jensen Road intersection operated at LOS C or D in 2014, and neither location was reported to satisfy traffic signal warrants. The General Plan EIR indicated that the other intersections on SR 33 in downtown Newman operated at LOS C or better.

Traffic Characteristics of Crows Landing Industrial Business Park. The DEIR indicated that the proposed project could produce up to 14,447 employees and generate a total of 52,422 daily trips, with 5,653 a.m. peak hour and 6,344 p.m. peak hour trips. However, the analysis did not speak to the share of project traffic that may be generated by large trucks, which would normally be an appreciable share of the traffic generated by High-Cube Warehouse / Distribution Center and General Light Industrial type projects. The facts of large trucks are often specifically aggressed based on *Passenger Care Equivalents* of 2.0 to 4.0 automobiles per truck. The report didn't indicate that any adjustment was made. 14-11

The trip distribution assumptions were made based on travel patterns created using the StanCOG Tri-County regional travel demand forecasting model. A plot of project specific peak hour traffic was included in the Appendix A to the Infrastructure plan, but as that illustration went no farther south than Marshall Road, it was not possible to validate the distribution assumptions in the area from Marshall Road south to Fink Road or on to Newman. 14-12

The City attempted to determine the distribution of project traffic based on the roadway segments volumes included in the evaluation of exiting plus project impacts (i.e., TIP Table VI) but that source did not include all of the roads that provide access to the proposed project. The total external daily volume that was identifiable totaled 35,536 vehicles per day. (Note: this total did not include any projection for Bell Road south of Fink Road). Because the total daily project trip generation totaled 52,422, roughly 16,886 daily trips must have been "internal". Of the external trips, 7,760 or 22% of the total continued on SR 33 south of Stuhr Road into Newman under short-term conditions. 14-13

Existing Plus Project Impacts. The materials available did not include the intersection Level of Service calculations, so the City did not attempt to review or check the calculations or to see how they addressed trucks. However, impacts were identified at all of the intersections on SR 33 south of Sperry Road. 14-14

The roadway segment analysis addressed SR 33 south of Stuhr Road. While the Proposed Project's trips would nearly double the current volume, the Level of Service would remain LOS D under the City's General Plan thresholds and under the thresholds employed for this analysis. 14-15

A relevant question would be how this additional traffic may impact the intersection on SR 33 from Stuhr Road through downtown Newman. The Master Plan Area DEIR traffic study concluded that while a traffic signal was not warranted at the SR 33 / Stuhr Road intersection under existing conditions, a signal would eventually be needed. Review of current traffic volumes and the amount of traffic contributed by the Proposed Project indicates that because minor street volumes on Stuhr Road already exceed the minimum needed to satisfy peak hour warrants, the additional SR 33 traffic caused by the Project could result in satisfaction of warrants at this location. 14-16

The City has not attempted to carry the DEIR analysis further, but has investigated the SR 33 / Inyo Avenue intersection via other projects. That location did not satisfy traffic signal warrants, primarily because the volume of traffic on SR 33 itself was too low to meet the "major street" requirement. The addition of 7,760 more trips through Newman, including an appreciable number of trucks, is likely to result in satisfaction of peak hour signal warrants at that location. 14-17

Cumulative Traffic Impacts. The DEIR's cumulative impact analysis makes use of Year 2035 traffic volume forecasts derived from the StanCOG Tri-County model. The TIP states that the traffic model was calibrated to existing conditions and as a result, its future forecasts are valid. However, no supporting information to back up the validation claim was provided and the City would appreciate seeing the information for SR 33 south of Stuhr Road. Historically, the Tri-County model has been a questionable tool and while we understand the model is being or has been updated; it has not been accepted by many jurisdictions. 14-18

The DEIR suggests that without the Proposed Project the daily traffic volume on SR 33 will increase. South of Stuhr Road the daily volume is expected to increase from 8,197 to 16,567 ADT. The Year 2035 volume will be LOS D under the City General Plan threshold for a 2-lane road. North of Stuhr Road the volume is projected at 10,296, which is LOS C or better under the criteria employed in the DEIR. 14-19

With the Proposed Project, the volume south of Stuhr is projected to increase to 23,599 ADT, which is reported to be LOS E. The roadway would operate at LOS F under the City's criteria, and a 4-lane facility is needed in either case. A 4-lane road is consistent with the City's General Plan and Traffic Impact Fee program. The analysis suggests that the volume north of Stuhr Road will reach 18,000 ADT but states that this segment will still operate at LOS D. In this case, the choice of capacity threshold noted earlier has a bearing, as the threshold identified in Table 3-12 would yield LOS E. While this area is beyond the Newman Sphere of Influence, Newman residents who frequently travel on SR 33 to Patterson will be affected by congestion on this route if improvements are not made. 14-20

The analysis did not include the SR 33 / Stuhr Road intersection. As noted earlier, this location is expected to warrant a signal in the future whether the Proposed Project is built or not. 14-21

Mitigations. The DEIR introduces a variety of improvements to intersection and roadway segments all of which are located north beyond the Newman Sphere of Influence. The TIP speaks to SR 33 through Newman.

SR 33 – South of Stuhr Road north of Newman. This section of roadway will exceed two-lane capacity by the end of Phase 3 when combined with 2035 growth traffic. SR 33 through Newman appears to have an ultimate width of three lanes in the existing urbanized area. If such a road section were extended north to Stuhr Road with signalization and other intersection improvements at Stuhr Road, this should supply adequate capacity. TJKM recommends that improvements to this corridor not be included in the initial CLIBP requirements but be handled with a traffic fee arrangement. 14-22

While the TIP speaks to a three-lane road, there is no identified volume threshold that suggests that a 3-lane facility provides the capacity needed to deliver LOS D. The DEIR deals with a 4-lane facility.

Mitigation on DEIR page 5-35 requires a fair share contribution to the cost of widening SR 33 to 4-lanes south of Stuhr Road. Three details need to be addressed with this mitigation: 14-23

1. ***What is the applicable "fair share"?*** Caltrans' standard approach for fair share calculation is based on a project's share of the total net new traffic on a facility after discount for existing

traffic. In this case the net new traffic on this segment of SR 33 is 15,402 ADT, and the Proposed Project contributes 6,824 ADT, or 44%. This is the value in the TIP. 14-23 Cont'd

2. ***Limits of improvements?*** As noted previously, the southerly limit of the roadway segment addressed in the DEIR appears to be Jensen Road. The basis for that limit is uncertain, as the analysis considers may other facilities within the limits of the City of Patterson so stopping at the City limit does not appear justified. It can be argued that the impact and mitigation area should extend all the way through the City unless some other agreement has been established previously between City and Stanislaus County to limit each other's areas of responsibility. 14-24
3. ***Significant and Unavoidable.*** As is typically the case when DEIR impacts cross jurisdictional boundaries, the DEIR concludes that Stanislaus County cannot guarantee that funding will be available for the balance of the cost of improving SR 33 from Stuhr Road to Newman. Thus, the document concludes that the impact is significant and unavoidable. The key issue is whether that finding relieves development in Crows Landing of the responsibility to pay its fair share of the cost of an "infeasible" mitigation. 14-25

A fair share contribution to the cost of improving the SR 33 / Stuhr Road intersection would be a reasonable mitigation as well, as would participation in the cost of SR 33 improvements south of Jensen Road. However, there is no nexus for the impact necessitating these improvements in the DEIR. 14-26

Action / Comments.

3. Based on the share of the Proposed Project's trips that appear to travel through Newman and the level of analysis provided for locations within the limits of Patterson, it would be in the City's interest to have the DEIR address impacts to locations previously not considered, such as: 14-27
    a. SR 33 / Stuhr Road
    b. SR 33 south of Jensen Road
    c. Intersections on SR 33 in Newman
4. The City requests clarification of the County's expectation for "fair share" contribution to SR 33 improvements. 14-28

<u>MISCELLANEOUS</u>

<u>Airport Layout Plan (ALP)</u>

Airport activity forecasts, maps and figures largely exclude impacts to the City of Newman in its analysis; there is concern that current and future impacts may exist. 14-29

The ALP's Narrative Report states, "The airport's use by large air cargo aircraft is neither envisioned not considered in this ALP report."[4] Is there any possibility that this may change? The aviation forecast summary states that the "… proposed Crows Landing Airport has approximately 132 acres available at build-out for future aviation-related development."[5] This alludes to possible changes in aircraft use of the Project.

Furthermore, Map CRO-5 identifies the airport's overflight zones. Although the City is not included in the Overflight Notification Area, the map suggests that the City would be directly under the flight path towards the Project. Further analysis is warranted. 14-30

---

[4] Draft EIR, Appendix B – ALP and Narrative Report, 2-1.
[5] Draft EIR, Appendix B – ALP and Narrative Report, 2-6.

Due to increased aircraft overflight as a result of the Project, aircraft noise is also expected to increase. However, the City of Newman was not included in the ALP's noise analysis. Have said impacts been deemed less than significant? If so, a discussion and summary should be included in the ALP. 14-31

Action / Comments. 14-32

5. Please revise the following to include the City of Newman:
    a. ALP Figure 1A. Location Map
    b. ALP Appendix C, Exhibit CRO-5
6. If the use of large air cargo aircraft is a potential use at the Project site, the impacts should be analyzed and distributed for public review and comment. 14-33
7. It is requested that additional flight path analysis (including noise impacts) be conducted to include the City of Newman. 14-34

The City of Newman appreciates your review, consideration and response to the above comments.

Please feel free to contact me, option 4 with any questions you may have. Sincerely,

Stephanie Ocasio

STEPHANIE OCASIO
City Planner

cc: Newman City Council
Michael Holland, Newman City Manager
Nubia Goldstein, Newman City Attorney
Jim DeMartini, Stanislaus County Supervisor
Keith Boggs, Stanislaus County Assistant Executive Officer
Angela Freitas, Stanislaus County Planning & Community Development Department Director

Response to Comment Letter 14 – City of Newman

Response to Comment 14-1

The County appreciates the commenter's review of the Draft EIR.

Response to Comment 14-2

The City's considerations identified in this comment are addressed in Responses to Comments 14-3 through 14-34 below. See also the Response to Comment 6-36 and Master Response 1.

Response to Comment 14-3

Please refer to the Response to Comment 6-36.

Response to Comment 14-4

Please refer to the Response to Comment 6-36.

Response to Comment 14-5

Please refer to the Response to Comment 6-36.

Response to Comment 14-6

Please refer to Master Response 1 and the Responses to Comment 6-17 and 6-28.

Response to Comment 14-7

TJKM revised the Transportation Infrastructure Plan (TIP) in 2018 for the Newman area after considering the information in the City of Newman General Plan and the Northwest Newman Master Plan and the traffic studies prepared to support these plans. Those documents identify future traffic volumes and widening plans for SR 33 within the City of Newman and signalization plans for SR 33 intersections. The updated TIP addresses many of the City comments. See Appendix A to this Final EIR, which is the updated TIP.

There will not be significant Specific Plan-related traffic using Stuhr Road between SR 33 and I-5, because use of Bell Road is quicker for Specific Plan traffic to reach the Stuhr Road interchange. There will be minor use of Bell Road between the Specific Plan Area and the Stuhr Road/I-5 interchange, but these volumes will not be appreciable because of the good connection between the Specific Plan Area and the Fink Road/I-5 interchange. At buildout, the Specific Plan will contribute less than 1,000 daily trips to the Stuhr Road interchange (via Bell Road). The Stanislaus County General Plan (April 2016) indicates this section of Stuhr Road will carry about 6,000 vehicles per day (vpd). This indicates that the Specific Plan would constitute approximately 17 percent of the total volume at the interchange during the cumulative scenario (please see Appendix A for more detail). However, these future volumes would not require any capacity improvements.

Please see also the Response to Comment 14-25.

Response to Comment 14-8

This comment does not raise specific questions or request information that pertains to the adequacy of the Draft EIR for addressing adverse physical impacts associated with the project.

Please see also the Response to Comment 14-25.

Response to Comment 14-9

Please see Response to Comment 14-20.

Response to Comment 14-10

Please refer to Responses to Comments 14-7 and 14-20.

Response to Comment 14-11

A typical truck percentage of daily traffic for distribution centers and light industrial uses is 20 to 25 percent. Most trucks will travel to the north or south on I-5, or to the east or north destinations including Modesto, Turlock, and the SR 99 corridor. However, trucks bound for destinations such as Gustine, Volta, or Los Banos are not likely to travel on SR 33 through Newman, because the use of I-5 interchanges with SR 140, SR 33, and SR 152 afford quicker truck and passenger vehicle trips to these areas and beyond.

Response to Comment 14-12

Please refer to Responses to Comments 14-13 and 14-15. See Appendix D to this Final EIR.

Response to Comment 14-13

A better gauge of project distribution than the hypothetical scenario proposed by the commenter is buildout plus project conditions, when both the project and the surrounding land uses are built out. In this scenario, about 6.5 percent of the project trips are internalized, with 49,035 distributed on the roadway system. The SR 33 count south of Stuhr Road is 6,842, or approximately 14 percent of all project traffic.

Response to Comment 14-14

TJKM revised the Transportation Infrastructure Plan (TIP) in 2018 for the Newman area after considering the information in the City of Newman General Plan and the Northwest Newman Master Plan and the traffic studies prepared to support these plans. Those documents identify future traffic volumes and widening plans for SR 33 within the City of Newman and signalization plans for SR 33 intersections. Please see Appendix A to this Final EIR, which is the updated TIP.

Please see also the Response to Comment 14-7.

Response to Comment 14-15

Based on information in the updated TIP, future volumes on SR 33 within the City of Newman would require six lanes to reach acceptable levels of service. The City opted to plan to build a maximum of four lanes, which results in conditions worse than LOS D. Please see also the Responses to Comments 14-7, 14-13, and 14-14.

Response to Comment 14-16

As explained in the updated TIP and the Response to Comment 14-7, it is likely that signals will be warranted at four additional locations based on General Plan and Northwest Newman Master Plan traffic studies. The Specific Plan’s fair share of these impacts would be approximately 14 percent.

Response to Comment 14-17

Inyo Street is one of the four locations along SR 33 identified as likely to meet traffic signal warrants as a result of growth in traffic. As noted above, the Specific Plan’s fair share of this impact would be approximately 14 percent.

Response to Comment 14-18

In the updated TIP, SR 33 traffic volumes in Newman are based on traffic studies prepared to support the Newman General Plan and the Northwest Newman Master Plan. Please refer to the Response to Comment 14-25 for a detailed description of the StanCOG Tri-County model. The Tri-County model is the best tool available to distribute Specific Plan traffic. Using these sources, the Specific Plan’s fair share of this impact would be approximately 14 percent.

Response to Comment 14-19

As stated in the Response to Comment 14-7, above, the updated TIP shows higher volumes on SR 33 south of Stuhr Road, based on City of Newman plans and associated traffic studies. Those volumes have been incorporated into the updated analyses. The commenter cites data included in Table 3.14-3 of Section 3.14, “Traffic and Transportation,” and Table 5-6 in Section 5.1, “Cumulative Impacts,” in Chapter 5.0, “Other CEQA,” of the Draft EIR.

Response to Comment 14-20

For the section of SR 33 south of Stuhr Road, the City General Plan upper LOS D limit is 18,000 vehicles per day (vpd). The General Plan and Northwest Newman Master Plan traffic studies indicate that this threshold will be exceeded. North of Stuhr Road, the Stanislaus County LOS D Standard ranges from 10,800 vehicles per day to 20,000 vpd. Regardless of the threshold, when the 18,000 vpd volume level is reached, SR 33 will be very busy. The area between Stuhr Road and Fink Road has no major intersections and few side streets and driveways, so the lack of “friction” allows the street to perform better at high-volume levels. County staff have experience with major 2-lane roads of this nature operating successfully at over 18,000 vpd. These volumes would occur at full buildout of the Specific Plan and the region in the cumulative scenario, so this condition may not happen for at least 15 to 20 years. The project is expected to pay its fair share of the improvements that will be required. Based on the procedures described in the traffic study, with existing volumes of 5,123 vpd, future 2035 plus project volumes of 18,000 vpd and project traffic of 7,704 vpd, the project traffic would create a 59.8 percent increase. Based on the assumption that most of these trips are generated by residents living south of this area, the project’s fair share is calculated at 29.9 percent.

Response to Comment 14-21

Please refer to Response to Comment 14-7. The Newman traffic studies indicate that future traffic signals in the SR 33 corridor in and near Newman will include intersections at Stuhr Road, Jensen Road, Yolo Street, and Inyo

Street. Traffic from the Specific Plan will contribute to all four of the new traffic signals. These studies seem reasonable because they are based on generalized standards for traffic signals being warranted when total intersection volumes reach 24,000 vpd with at least 3,000 vehicles on one leg of the side street. All four of the signals may not be warranted for many years. Mitigation Measure – Cumulative with Project Transportation 1: Traffic Signal Installation has been revised to require fair-share contribution to the signalization of SR 33 intersections with Stuhr Road, Jensen Road, Yolo Street, and Inyo Street.

Please see Chapter 3 of this Final EIR for revisions to the Draft EIR.

Response to Comment 14-22

See the updated TIP for responses. The City's plans indicate this area will ultimately require four lanes, resulting in a Specific Plan fair-share responsibility of 14 percent, as currently estimated. Mitigation Measure – Cumulative with Project Transportation 1: Traffic Signal Installation has been revised to require fair-share contribution to the signalization of SR 33 intersections with Stuhr Road, Jensen Road, Yolo Street, and Inyo Street. Please see Chapter 3 of this Final EIR for revisions to the Draft EIR. In addition, Mitigation Measure – Cumulative with Project Transportation 2: Roadway Widening has been revised to require fair-share contributions to the widening of SR 33 south of Stuhr Road to Inyo Street. Please see Chapter 3 of this Final EIR for revisions to the Draft EIR.

Please see the updated TIP, which is Appendix A of this Final EIR, starting on page 36, in particular. Please refer also to Response to Comment 14-7.

Response to Comment 14-23

The Draft EIR uses the same fair-share calculation methodology recommended by Caltrans. However, based on the City's General Plan and Northwest Newman Master Plan traffic studies, within the SR 33 corridor south of Stuhr Road, the Specific Plan fair-share calculation is approximately 14 percent. Please see the updated TIP, which is Appendix A of this Final EIR, starting on page 36, in particular.

Response to Comment 14-24

Please see the Response to Comment 14-7 and the updated TIP. The calculated fair share for improvements to SR 33 within the City of Newman is 14 percent. Please see the updated TIP, which is Appendix A of this Final EIR, starting on page 36, in particular.

Response to Comment 14-25

The Draft EIR utilized the Tri-County traffic model to evaluate traffic conditions. The model was used to evaluate Existing Plus project, 2035 no project, and 2035 Plus Project. There would be no impacts to SR 33 north of the City of Newman due to the fact that other area roadway improvements and the subsequent draw of traffic away from this area. Although the project cannot alone improve the State Route 33 corridor, if and when improvements are made, the project will pay a fair share of 14 percent. Because the project would not be solely responsible for the improvements, and because the County alone cannot guarantee implementation of the required improvements, the impact is considered significant and unavoidable. However, this does not relieve the County of the obligation to contribute a fair share to the specified improvements as they are planned.

The Tri-County Traffic Model for travel demand forecasts was used in the analysis. The model geographically covers the counties of San Joaquin, Stanislaus, and Merced. It was developed by the San Joaquin Council of Governments (SJCOG) and recalibrated so that it closely replicated the existing conditions. In addition, three new traffic analysis zones (TAZs) were developed for the project area, and loaded with the ITE trip generation into the model for trip distribution and assignment. The model integrates the network and land use information from the StanCOG model, the SJCOG travel demand forecasting model, and the Merced County Association of Governments (MCAG) travel demand forecasting model. The combined model provides good coverage of the study area, extending from Tracy-Stockton to the north to Los Banos to the south. The model was used to forecast A.M. and P.M. peak-hour and daily trips. Therefore, this methodology provides an accurate forecast of Cumulative plus Project Conditions.

Response to Comment 14-26

As stated in previous Responses to Comments 14-23 and 14-25, above, the Specific Plan's fair share for improvements along SR 33 within the city of Newman is estimated to be 14 percent.

Response to Comment 14-27

Please see previous Responses to Comment 14-22, above.

Development in the Specific Plan Area will fund its fair share of traffic improvements. Based on the City's General Plan, it appears that SR 33 will eventually need to be widened to four lanes to the southern City limits. As stated in the responses cited above, the Specific Plan's fair share of such improvements would be 14 percent. However, based on current counts of about 6,000 to 7,000 vpd near the southern City limits, it will be many years before widening is needed in this area.

Response to Comment 14-28

As used in this Draft EIR, fair share is defined as the proportion of traffic growth attributable to the Specific Plan at a given location. Please see the Responses to Comment 14-22, above. Please see also the updated TIP, included as Appendix A of this Final EIR.

Response to Comment 14-29

The Specific Plan envisions an airport in accordance with FAA Airport Reference Code (ARC) B II, which is associated with small aircraft, such as the Cirrus SR22, Grumman Ag Cat, and Citation II (small business jet). The facilities envisioned for the first 30 years of operation would not support large air cargo aircraft. Facility development beyond the 30-year timeframe would occur based on demand, are not considered reasonably foreseeable at this time, and are not envisioned in association with a specific aviation use.

If aviation demand changes and larger aircraft need to use the airport regularly, additional improvements will be required such as runway lengthening, increased runway-to-taxiway separation, and new lighting and navigational aids.

The Airport Layout Plan identifies approximately 132 acres for future aviation-related development, primarily on the southwest side of the runway. Improvements would be constructed in that area as additional facilities are warranted. Additional environmental review would be required at that time to evaluate the potential environmental effects associated with those improvements, including property acquisition, and necessary revisions to the Airport Land Use Compatibility Plan.

As detailed on pages 1-2 and 1-3, the Specific Plan and EIR anticipate the effects of subsequent projects proposed within the Specific Plan Area, as well as infrastructure improvements needed to support future development within the Specific Plan Area. Future projects that are consistent with the Specific Plan would either require no further environmental analysis or focused environmental analysis. The County will examine all applications for projects within the Specific Plan Area to determine whether additional CEQA analysis will be necessary. If unanticipated changes to the airport element or other components of the Specific Plan are proposed, additional environmental review and mitigation may be required. This EIR will be used for the tiering of later project-specific reviews.

Response to Comment 14-30

Overflight policies serve primarily to establish the form and requirements for notification about airport proximity and aircraft overflight to be given in conjunction with local agency approval of new residential development and certain real estate transactions involving existing residential development.

ALP Exhibit CRO-5 in Appendix C of this Final EIR shows potential flight paths for the Specific Plan. This information was used to develop ALUCP policy maps. The boundary of the overflight area for the proposed Crows Landing Airport is depicted on proposed ALCUP Map CRO-5, Overflight Zones Policy Map. The overflight area encompasses locations where approximately 80 percent or more of the aircraft overflight will occur in conjunction with the proposed airport. The Newman City limits are about 6.5 miles from the nearest runway end. Although some aircraft will fly over the City of Newman, the pattern of aircraft arriving and departing the Airport will be dispersed based on the distance between the City and the proposed airport and the different origins and destinations for each flight. At that distance from the Airport, the variation in flight paths by the small aircraft is too great to support evaluation of overflights.

Please refer also to the Response to Comment 14-31.

Response to Comment 14-31

The geographic extent of the area associated with aircraft noise was evaluated in the Draft EIR, and the geographic area associated with significant aircraft noise exposure does not extend to the City of Newman or its sphere of influence. The City was not omitted from the analysis.

As described in Chapter 3.12, “Noise and Vibration”, neither the city of Newman nor the area in its sphere of influence would be exposed to aircraft noise at levels exceeding regulatory thresholds. The California Code of Regulations (CCR) states that “The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a Community Noise Equivalent Level (CNEL) value of 65 dB for purposes of these regulations.” As shown on Exhibits 3.12-6 and 3.12-7 in Section 3.12 of the Draft EIR, the area associated with the 65 CNEL noise contour would remain entirely within the airport boundaries for the first 30 years of airport operation.

The Stanislaus County Airport Land Use Compatibility Plan (2016) includes specific policies for proposed development in areas exposed to aircraft noise at levels greater than 55 CNEL, and the policies summarizing land use and noise exposure are summarized in Table 3.12-9. As shown on Exhibits 3.12-6 and 3.12-7 in Section 3.12 of the Draft EIR, aircraft noise exposure within the 55 CNEL noise contour would remain almost entirely on airport property for the first 10 years of aircraft operation and extends only to adjacent agricultural parcels for the first 30 years of airport operation. Aircraft noise exposure at levels less than 55 CNEL are considered less than significant. The City of Newman and its sphere of influence are located more than five miles from the Specific Plan Area and the 55 CNEL noise contour.

Response to Comment 14-32

The comment does not pertain to the adequacy of the environmental impact analysis in the Draft EIR. The comment seems to refer to ALUCP Exhibit CRO-5. The updated documents are included as Appendix C to this Final EIR. ALP Figure 1A and ALUCP Exhibit CRO-5 have been revised to identify the location of the City of Newman.

Response to Comment 14-33

The Specific Plan is envisioned primarily as a mixed-use industrial business park designed to support a variety of light industrial, logistics, warehouse, distribution, office, and aviation-related land uses. Only the general aviation airport, which will be constructed to reuse a former military runway (Runway 12-30), is fixed by size and location. Please also see Response to Comment 14-29.

Response to Comment 14-34

The number and location of forecast aircraft operations used as input to the aircraft noise analysis is described in the Draft EIR. As shown on Airport Layout Plan Exhibit CRO-5 and ALUCP Map CRO-5, more than 80 percent of the aircraft overflight will occur outside of the city of Newman. A noise analysis was performed to identify aircraft noise exposure within the flight pattern was also performed. As presented in Section 3.12, “Noise and Vibration,” and Chapter 5.0, “Other CEQA,” of the Draft EIR, cumulative noise effects exceeding 65 CNEL would remain entirely within airport boundaries, and cumulative noise effects exceeding 55 CNEL are unlikely to extend beyond the airport and its immediately adjacent parcels during the first 30 years of operation. Aircraft related noise exposure outside of the 55 CNEL noise contour is considered less than significant.

This page intentionally left blank

2.3.15 LETTER 15, NORTHERN DELTA MENDOTA, DATED APRIL 26, 2018

Letter 15

NORTHERN
D E L T A
MENDOTA

(received May 15, 2018)

April 26, 2018

Delivered by e-mail

Stanislaus County
Planning and Community Development Department
c/o: Rachel Wyse, Senior Planner

Subject: **Comments on Draft Environmental Impact Report for the proposed Crows Landing Industrial Business Park Project; State Clearinghouse No.2014102035**

Dear Rachel Wyse,

The San Luis & Delta-Mendota Water Authority (SLDMWA) on behalf of the Central Delta-Mendota Region Multi-Agency GSA, City of Patterson GSA, DM-II GSA, Northwestern Delta-Mendota GSA, Patterson Irrigation District, West Stanislaus Irrigation District – 1 & 2 GSA, collectively the Northern and Central Delta-Mendota Region GSA's ("GSA's"), appreciate this opportunity to submit comments on Stanislaus Counties Draft Environmental Impact Report (the "DEIR") for the Crows Landing Industrial Business Park Project (the "Project"). 15-1

Background

In August of 2014, Governor Brown signed into law the Sustainable Groundwater Management Act ("SGMA"). SGMA intends "to provide local groundwater agencies with the authority and technical and financial assistance necessary to sustainably manage groundwater" (California Water Code Section 10720(d)). Pursuant to Water Code Section 107271, sustainable groundwater management is defined as "[m]anagement and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." 15-2

According to Water Code Section 10721, there are six (6) criteria used to determine whether or not undesirable results are occurring in a subbasin and they include (1) chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon; (2) significant and unreasonable reduction of groundwater storage; (3) significant and unreasonable seawater intrusion; (4) significant and unreasonable degraded water quality; including the migration of contaminant plumes that impair water supplies; (5) significant and unreasonable land subsidence that substantially interferes with surface land uses; and (6) depletion of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of surface water. 15-2 Cont'd

The aforementioned Northern and Central Delta-Mendota Region GSA's are legislatively formed agencies created to develop and implement a groundwater sustainability plan ("GSP") and to sustainably management groundwater within their boundaries and the subbasin. These exclusive GSA's encompass an area of more than 320,000 acres within the counties of Stanislaus, Merced, and Fresno and their boundaries are as follows: western boundary generally follows the Coast Range, eastern boundary is the San Joaquin River in Stanislaus county and the water district boundaries in Merced and Fresno counties, northern boundary to the south of the City of Tracy, and southern boundary is the northern perimeter of the Westside subbasin as described in a California Department of Water Resources report titled "California's Groundwater – Bulletin 118, Interim Update 2016." In February of 2017, the Northern and Central Delta-Mendota Region GSA's began coordinating with the SLDMWA to obtain coordinated access to administrative and technical resources through SLDMWA to comply with the sustainable management of groundwater pursuant to SGMA, which is codified in the California Water Code. 15-3

Comments

As the exclusive GSA's overlying and adjacent to the area in which the Project is planned, the GSA's are responsible for developing a GSP with a goal of the local groundwater supply reaching sustainability by 2040. New developments that rely on groundwater are of concern to the GSA's and as such SLDMWA, on behalf of the GSA's, has reviewed the DEIR document with a focus on SGMA criteria. 15-4

The DEIR specifically mentions the regulatory framework in the Project area, specifically SGMA and its 'undesirable results.' Although SGMA is referenced as well as the individual undesirable results, the Project will not be initially governed by SGMA but by the Stanislaus County Groundwater Ordinance (Chapter 9.37 of the Stanislaus County Code). Prior to GSP adoption, the Stanislaus County Groundwater Ordinance provides a mechanism to conduct water resources and environmental impact evaluations for non-exempt water well extractions utilizing the concept of avoiding "undesirable results" in the same resource areas of concern as described in SGMA and the GSP regulations.

Conclusion

The Delta-Mendota subbasin is defined by the Department of Water Resources as being critically overdrafted and any project relying upon that same resource could exacerbate the problem. That being said, being as there is currently no final Groundwater Sustainability Plan or measurable objectives with respect to sustainability in the area, the GSA's acknowledge the Project should be controlled by the Stanislaus County Groundwater Ordinance until such time that a GSP is adopted. In addition, the final EIR must acknowledge that Project wells extraction permits will be limited to terms aligned with the overlying GSA and GSP adoption and update cycles. 15-5

Thank you for the opportunity to submit and for considering these comments. These comments are provided to assist Stanislaus County in developing a final EIR addressing how the Project will be sustainable and not contribute to undesirable results within the Delta-Mendota Subbasin. The Northern & Central Delta-Mendota Region GSA's look forward to collaboration with the County as it incorporates the requirements of SGMA into the Project analysis. 15-6

If you have any questions, Andrew Garcia with my staff is available. Additionally, the GSA's request that you provide Mr. Garcia with copies of all notices for or regarding the Project. Notices may be sent via email

Sincerely,

Frances C. Mizuno

Frances C. Mizuno
Assistant Executive Director

Response to Comment Letter 15 – San Luis & Delta-Mendota Water Authority

Response to Comment 15-1

The County appreciates the commenter's review of the Draft EIR.

Response to Comment 15-2

The Draft EIR provides a detailed description of the Sustainable Groundwater Management Act on page 3.10-22, in Section 3.10," Hydrology and Water Quality," of the Draft EIR.

Response to Comment 15-3

The comment does not pertain to the adequacy of the environmental impact analysis in the Draft EIR. The following revision has been made to page 3.11-22 in Section 3.10, "Hydrology and Water Quality," of the Draft EIR. Please see also Chapter 3 of this Final EIR, "Errata." These edits do not change the analysis or conclusions of the Draft EIR. Rather, these revisions provide additional information regarding the Northern and Central Delta Mendota Region GSAs.

> Locally established GSAs are part of the Northern Delta-Mendota Management Committee, and include the City of Patterson GSA, DM-II GSA, North-Western GSA, Patterson Irrigation District GSA, and West Stanislaus Irrigation District – 1 & 2 GSAs. Together with other GSAs established in the central and southern portions of the subbasin, they encompass an area of more than 320,000 acres within the counties of Stanislaus, Merced, and Fresno. Their boundaries are as follows: the western boundary generally follows the Coast Range, the eastern boundary is the San Joaquin River in Stanislaus County and the water district boundaries in Merced and Fresno counties, the northern boundary is located to the south of the City of Tracy, and southern boundary is the northern perimeter of the Westside subbasin. In February 2017, the Northern Delta-Mendota Management Committee and the Central Delta-Mendota Management Committee began coordinating with the SLDMWA to obtain coordinated access to administrative and technical resources through the San Luis & Delta-Mendota Water Authority to comply with the sustainable management of groundwater pursuant to SGMA.

Response to Comment 15-4

Please see Response to Comment 15-5.

Response to Comment 15-5

As discussed in Responses to Comments 6-49 and 6-50, the evaluation presented in Section 3.10 of the Draft EIR and in the Groundwater Resources Impact Assessment prepared to support the EIR demonstrates that the Project will not contribute to critical overdraft in the Delta-Mendota Subbasin because it will not contribute to "undesirable results" as defined in SGMA. See Appendix B to the Final EIR for the Groundwater Resources Impact Assessment.

Section 3.10, "Hydrology and Water Quality," of the Draft EIR provides a detailed regulatory description of the Stanislaus County Groundwater Ordinance. Page 3.10-25 of the Draft EIR states that Stanislaus County's Groundwater Ordinance is aligned with the requirements of Sustainable Groundwater Management Act. The

Ordinance requires that applications for new wells proposed to be installed before a GSP is adopted include substantial evidence they will not be withdrawing groundwater unsustainably. Impact 3.10-4 analyzes the potential impacts of the Specific Plan on groundwater resources (pages 3.10-40 to 3.10-46 of the Draft EIR). The Groundwater Resources Impact Assessment prepared to support the EIR provides the substantial evidence required for wells associated with the Specific Plan. As discussed in Response to Comment 6-50, the Groundwater Ordinance requires that the extraction permits issued for Specific Plan wells must be aligned with GSP adoption and update cycles. Mitigation Measure 3.10-4b, "Conduct and Report Groundwater Level Monitoring," requires the County to coordinate with the Groundwater Sustainability Agency to prepare on groundwater monitoring conducted as a part of implementation of the Groundwater Sustainability Plan for the vicinity of the Specific Plan Area. Groundwater level monitoring activities, findings, and reporting schedule will also be defined in the Groundwater Sustainability Plan, along with the Minimum Thresholds and Measurable Objectives required in a Groundwater Sustainability Plan that govern when investigation and intervention is required and what adjustments to well field operation or other actions are required to avoid effects to existing off-site wells.

In addition, development of groundwater resources to support the Specific Plan must comply with the Stanislaus County Groundwater Ordinance. As stated on page 3.10-46 of the Draft EIR, prior to issuing a permit to construct a new groundwater supply well, the County must review information and make a determination whether it constitutes substantial evidence that the proposed groundwater extraction will not cause or contribute to one or more of the above undesirable results. The Groundwater Resources Impact Assessment prepared to support the EIR fulfills the substantial evidence requirement for demonstrating compliance with the sustainable groundwater management requirements in the Stanislaus County Groundwater Ordinance. See Appendix B to the Final EIR for the Groundwater Resources Impact Assessment.

Please also see Response to Comments 6-49 and 6-50.

Response to Comment 15-6

Please see Response to Comment 15-5. Please also see Response to Comment 6-49.

This page intentionally left blank

2.3.16 Letter 16, Ken Mustoe, Date Not Provided

Letter 16

Stanislaus County Planning and Community Development Department
C/O Rachel Wyse, Senior Planner

The Crows Landing Industrial Business Park Specific Plan Draft EIR is deficient in fully disclosing the scope of the project and evaluating its impacts. 16-1

Lack of Buildout Square Footage

The lack of a buildout square footage value in the Draft EIR is a major red flag and suggests that the project remains ill-defined at this point in the process. 16-2

Water and Wastewater

The water supply and wastewater plans do not appear to be well developed. Both service systems rely on the cooperation of third-party agencies (such as the City of Patterson), which may not have the resources or the willingness to provide services to Crows Landing. Moreover, the EIR acknowledges that the City of Patterson has not accounted for the project in its utility planning efforts and the City itself has previously gone on record with its opposition to a previous incarnation of this project (WestPark). Thus, there is no reason to believe that the City would be willing to provide water and wastewater service to this project. The water and wastewater section are deficient. The project does not have sewer and water is not proven to be available. 16-3

Traffic

For a project that would generate more than 52,000 daily trips at buildout, the EIR's traffic analysis is surprisingly brief and only evaluates Existing Plus Project intersection operations and roadway segments. It is rather eyebrow-raising that the existing Interstate 5/Fink Road interchange can serve a 15,000-worker employment center with only fairly modest improvements (signalization and a westbound left turn lane). The EIR traffic section is deficient. 16-4

Airport Runway Extension

Another item of concern is that the Specific Plan and Airport Layout Plan have different visions for the general aviation airport. The Airport Layout Plan contemplates a 1,000-foot extension of the existing 5,175-foot runway, which would make the airport suitable for commercial jets such as Boeing 737s. However, the Specific Plan deems this as "speculative" and does not contemplate such an extension. We would note that this sets the stage for the County to come back at a later date and process an addendum to the certified EIR to allow for a runway extension should it be deemed viable in the future. As a matter of good CEQA practice, the County should be up front and identify the 1,000-foot runway extension as an element of the Specific Plan and evaluate the impacts in the EIR. 16-5

Lastly, the alternatives analysis is wholly inadequate and is clearly designed to "sell the project." Only one alternative is evaluated in detail and other, feasible alternatives are dismissed early on. 16-6

Conclusion

The Crows Landing site is poorly suited to support the level of development contemplated by the Specific Plan. Furthermore, there are better sites that are currently entitled for light industrial and business park development within incorporated cities in western Stanislaus County, specifically the City of Patterson. From a regional planning standpoint, it makes far more sense to promote buildout of these established employment centers first, and then move to more isolated sites such as Crows Landing. 16-7

Finally, the County would be better served if focused only on establishing a general aviation airport at Crows Landing. The EIR makes clear that Crows Landing has very few constraints for aviation-related uses and has an existing concrete runway that can be readily rehabilitated. Furthermore, there is a need for a modern general aviation airport on the Westside, particularly with the closure of the antiquated Patterson Airport. Such a facility could be expanded in the future and would have the ability to cater to specialized aviation activities such as firefighting, commercial flight instruction, or air shows that may not be suitable or compatible at urban aviation facilities such as Modesto City County Airport. At a minimum, the EIR should have considered this as a project alternative. 16-8

Sincerely,

Ken Mustoe

2

Response to Comment Letter 16 – Ken Mustoe

Response to Comment 16-1

The commenter has made a general statement regarding disclosure of the project's scope and evaluation of impacts. Please see Master Response 1.

Response to Comment 16-2

There are a variety of ways a lead agency can characterize plans and projects. Draft EIR Table 2-1 (page 2-12) lists each type of projected land use at the project site, along with a brief description of what that land use would entail, and then specifies the number of acres at the project site that would be devoted to that land use. The land uses are described on Draft EIR pages 2-12, 2-15, and 2-15, and are shown graphically in Exhibit 2-5 (page 2-13). As stated on Draft EIR page 2-11, "[T]hese land uses would be developed in three 10-year phases to provide the opportunity for approximately 14,000 to 15,000 jobs at full buildout." The Draft EIR has clearly and comprehensively identified and described the types of land uses that would occur, the locations where such land uses would occur, and has stated the number of expected new jobs, as well the full complement of infrastructure required to serve the project at buildout. The detailed project description from Chapter 2 of the Draft EIR supports the comprehensive analysis of the project's potential impacts on the environment throughout Chapters 3, 4, and 5.

See also Master Response 1.

Response to Comment 16-3

Please refer to Responses to Comments 6-10 through 6-20, 6-49, and 6-50 related to water supply and wastewater treatment.

Response to Comment 16-4

Section 5.1, "Cumulative Impacts," in Chapter 5, "Other CEQA," of the Draft EIR describes the Cumulative plus Project Conditions scenario. As described in Section 3.14 of the Draft EIR, "Traffic and Transportation," mitigation measures would require signalization of the intersections of I-5 NB Ramps and Fink Road and I-5 SB Ramps and Fink Road. With signalization of the intersections of I-5 NB Ramps and Fink Road and I-5 SB Ramps and Fink Road, the resultant LOS would be LOS C or better, which meets the County's goal of at least LOS C for intersections. Please also see Response to Comment 6-64.

For information regarding trip generation methodology and calculations, criteria by jurisdiction, and required intersection improvements please refer to the *Transportation Infrastructure Plan*, available as Appendix A to this Final EIR.

Response to Comment 16-5

The Specific Plan does not propose a runway extension and does not include plans for air cargo terminal. The proposed Crows Landing Airport Layout Plan identifies potential airport development over a 30-year timeframe. The airport will include a 5,175-foot runway the first 30 years of operation. Although the Airport Layout Plan identifies that a runway extension may occur after the 30-year planning horizon, the extension would occur only as warranted by user demand and when funding is available. Therefore, this future runway extension is neither reasonably foreseeable at this time nor identified as phased improvement. The potential effects of the future runway extension are considered Section 5.1.3, “Cumulative Impacts Analysis” of the Draft EIR. Supplemental environmental analyses and revisions to the County’s Airport Land Use Compatibility Plan will be required prior to the construction of a runway extension.

Please see Response to Comment 14-29, Master Response 1, and Master Response 2.

Response to Comment 16-6

Please see Responses to Comment 6-58 and 6-62 for further discussion related to selection of alternatives considered in the Draft EIR.

Response to Comment 16-7

The commenter does not identify specific sites that are entitled for light industrial and business park development in the city of Patterson or in the region. It is the commenter’s opinion that buildout of these sites should occur before development of the Specific Plan.

See Responses to Comment 6-58 and 6-62 and Master Response 1.

Response to Comment 16-8

See Responses to Comment 6-58 and 6-62 and Master Response 1 for further discussion related to the project objectives and selection of alternatives considered in the Draft EIR.

3 ERRATA

Chapter 4 identifies revisions to the Draft EIR. The changes are presented in the order in which they appear and identified by page number. Text deletions are shown in strikeout (~~strikeout~~) and additions are underlined (underlined). These edits provide clarifications or additional supportive information and do not change the analysis or conclusions of the Draft EIR.

EXECUTIVE SUMMARY

On page ES-43 of the Draft EIR, Table ES-1, the number of the following mitigation measure has been updated:

> Mitigation Measure 3.15-~~4~~5. Demonstrate Adequate Wastewater Treatment Capacity.

CHAPTER 2, PROJECT DESCRIPTION

Page 2-23 of the Draft EIR has been revised as follows:

> During Phase 1, the County may allow ~~use of~~ new on-site systems until the permanent sewer system and ultimate connection to the City of Patterson Water Quality Control Facility has been completed for the~~ir~~ area served. If on-site wastewater treatment facilities are used, the systems will be required to meet Stanislaus County's Guidelines for Septic System Design and other relevant standards ~~and other relevant standards~~.

CHAPTER 3, ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

SECTION 3.2, AIR QUALITY

On page 3.2-20 of the Draft EIR, the following revised text was incorporated under the section entitled "Methodology":

> The proposed project's construction-related air quality emissions were estimated using California Emissions Estimator Model (CalEEMod), Version ~~2013.2.2~~2016.3.2 (CAPCOA ~~2013~~2016).
>
> and
>
> Regional operational emissions of criteria air pollutants and precursors were also estimated using the CalEEMod Version ~~2013.2.2~~2016.3.2 (CAPCOA ~~2013~~2016).

On page 3.2-21 of the Draft EIR, the following revised text was incorporated under the section entitled "Methodology":

> Air quality emissions associated with TRUs were estimated assuming that approximately ~~60~~100 percent of heavy-duty truck trips for Refrigerated Warehouses and 20 percent of heavy-duty truck trips for General Light Industrial land uses, respectively, would be equipped with a TRU.

On page 3.2-21 of the Draft EIR, the following revised text has been incorporated under Methodology:

The proposed project's operational emissions at full buildout were modeled for the year ~~2035~~2045, which is the ~~latest~~ year for operational emissions in CalEEMod that is nearest to the anticipated full buildout year of 2046. Annual operational emissions were compared with SJVAPCD thresholds of significance.

On page 3.2-23 of the Draft EIR, Table 3.2-6, the threshold of significance was updated:

4. Toxic Air Contaminants

Table 3.2-6
Thresholds of Significance for Toxic Air Contaminants

Carcinogens	Maximally Exposed Individual risk **equals or exceeds ~~10~~20 in one million**	
Non-carcinogens	**Acute:** Hazard Index **equals or exceeds 1** for the Maximally Exposed Individual	
	Chronic: Hazard Index **equals or exceeds 1** for the Maximally Exposed Individual	

Notes: Carcinogenic (cancer) risk is expressed as cancer cases per one million. Non-carcinogenic (acute and chronic) hazard indices (HI) are expressed as a ratio of expected exposure levels to acceptable exposure levels.

Source: SJVAPCD 2015

On Page 3.2-24 of the Draft EIR, Table 3.2-7 the emissions estimates were revised based on use of the new version of emissions model:

Table 3.2-7
Unmitigated Construction-Related Emissions

Construction Phase	Emissions (tons)[1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	~~125.43~~118.17	~~165.30~~235.91	~~405.99~~186.74	~~1.10~~0.98	~~66.69~~61.30	~~21.36~~18.61
Phase 2	~~30.19~~29.78	~~34.18~~55.60	~~92.70~~51.72	~~0.31~~0.29	~~19.49~~22.48	~~6.23~~6.67
Phase 3	~~39.96~~37.97	~~10.78~~67.81	~~24.02~~46.54	~~0.05~~0.33	~~18.63~~22.18	~~5.04~~6.48
Total Construction Emissions	~~195.59~~185.92	~~210.26~~359.31	~~522.72~~285.01	~~1.46~~1.6	~~104.82~~105.96	~~32.63~~31.76
Annual Average Emissions (tons/year)[2]	~~6.52~~6.20	~~7.01~~11.98	~~17.42~~9.50	~~0.05~~0.05	~~3.49~~3.53	~~1.09~~1.06
Maximum Annual Emissions (tons/year)	~~15.31~~14.43	~~25.80~~35.14	~~58.1~~27.96	~~0.15~~0.14	~~8.36~~7.74	~~2.64~~2.27
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds?[3]	Yes	Yes	No	No	No	No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District

1 All emissions are shown in units of tons unless noted otherwise.

2 Total construction emissions were averaged over the total construction schedule (*i.e.*, 30 years) to calculate annual average construction emissions.

3 Significance is determined using the maximum annual emissions.

Table 3.2-7
Unmitigated Construction-Related Emissions

Construction Phase	Emissions (tons)[1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Source: AECOM 201~~6~~8						

On page 3.2-27 of the Draft EIR, Mitigation Measure 3.2-1a was split into two measures to clarify enforcement responsibilities for two distinct parts of the previous Mitigation Measure 3.2-1a. Mitigation Measure 3.2-1a from the Draft EIR is now Mitigation Measures 3.2-1a and 3.2-1b. Compliance with requirements of the Air District's Rule 9510 is under Mitigation Measure 3.2-1a, with the Air District responsible for enforcement oversight. The newly labeled Mitigation Measure 3.2-1b addresses the type of construction equipment used, and the County is responsible for enforcement oversight. Mitigation Measure 3.2-1a has also been revised to mention the potential to use a voluntary emissions reduction agreement to reduce emissions.

Mitigation Measure 3.2-1a: Comply with Current ISR ~~and Use Current Phase Equipment for All Construction Equipment~~.

As applicable, based on the project size thresholds specified in Rule 9510 (Indirect Source Review), projects within the Specific Plan Area shall comply with SJVAPCD's Rule 9510 Indirect Source Review (ISR) and reduce criteria air pollutant emissions consistent with SJVAPCD performance standards through feasible on-site strategies and, if necessary, feasible payment of off-site mitigation fees to SJVAPCD through a voluntary emission reduction agreement (VERA) or other appropriate mechanism. ~~Site developers/leaseholders/project applicants who wish to develop facilities in the Specific Plan area shall construct all facilities using current phase construction equipment (currently Tier 4).~~

Implementation: Leaseholder/developer/contractors.

Timing: Demonstrate compliance prior to issuance of building permit.

Enforcement: ~~Stanislaus County and~~ SJVAPCD.

Mitigation Measure 3.2-1b: Use Current Phase Equipment for All Construction Equipment.

Site developers/leaseholders/project applicants who wish to develop facilities in the Specific Plan Area shall ~~construct~~ provide for County review and approval a proposed inventory of equipment for development within the Specific Plan Area that demonstrates use of ~~all facilities using~~ current phase construction equipment (currently Tier 4).

Implementation: Leaseholder/developer/contractors.

Timing: Demonstrate compliance prior to issuance of building permit.

Enforcement: Stanislaus County.

On page 3.2-28 of the Draft EIR, the following revised text was incorporated under the discussion of "Significance after Mitigation":

Compliance with regulatory requirements and the implementation of Mitigation Measure 3.2-1a and Mitigation Measure 3.2-1b would reduce on-site construction-related air quality emissions.

On page 3.2-28 of the Draft EIR, Table 3.2-8, the emissions estimates were revised with the results from the new version of the emissions model:

Table 3.2-8
Mitigated Construction-Related Emissions

Construction Phase	Emissions (tons) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Phase 1	~~123.42~~116.02	~~136.96~~195.28	~~404.15~~188.00	~~1.10~~0.98	~~64.18~~60.07	~~19.50~~17.21
Phase 2	~~28.99~~28.44	~~21.99~~46.70	~~94.36~~53.10	~~0.31~~0.29	~~18.24~~21.43	~~5.42~~6.05
Phase 3	~~38.79~~36.15	~~4.34~~61.91	~~27.21~~49.72	~~0.05~~0.33	~~17.67~~21.24	~~4.54~~6.00
Total Construction Emissions	~~191.20~~185.92	~~163.29~~359.31	~~525.72~~285.01	~~1.46~~1.60	~~100.09~~105.96	~~29.46~~31.76
Maximum Annual Emissions (tons/year)	~~15.05~~14.43	~~23.35~~35.14	~~58.15~~27.96	~~0.15~~0.14	~~8.19~~7.74	~~2.49~~2.27
Annual Average Emissions (tons/year) [2]	~~6.37~~6.20	~~5.44~~11.98	~~17.52~~9.50	~~0.05~~0.05	~~3.34~~3.53	~~0.98~~1.06
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds? [3]	Yes	Yes	No	No	No	No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; SJVAPCD = San Joaquin Valley Air Pollution Control District

[1] All emissions are shown in units of tons unless noted otherwise.

[2] Total construction emissions were averaged over the total construction schedule (*i.e.*, 30 years) to calculate annual average construction emissions.

[3] Significance is determined using the maximum annual emissions.

Source: AECOM 201~~6~~8

On page 3.2-29, Table 3.2-9, the emissions estimates and associated text were revised with the results from the new version of the emissions model:

As shown in Table 3.2-9, the proposed project's annual long-term operational emissions would exceed the SJVAPCD thresholds of significance for ROG, NO_x, and CO~~, PM_{10}, and $PM_{2.5}$~~. The impact would be **significant**.

Table 3.2-9
Crows Landing Annual Operational Emissions (Full Buildout)

Construction Phase	Emissions (tons/year) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	~~103.49~~103.54	0.00	0.21	0.00	0.00	~~0.00~~0.43
Energy Sources	~~1.94~~1.86	~~17.65~~16.90	~~14.83~~14.20	~~0.11~~0.10	~~1.34~~1.28	~~1.34~~1.28
Mobile Sources	~~20.82~~3.34	~~59.23~~28.22	~~241.68~~71.42	~~0.97~~0.57	~~59.61~~6.80	~~17.01~~2.73
Transport Refrigeration Units	~~38.08~~44.79	~~277.87~~326.83	~~399.76~~470.21	~~0.66~~0.77	~~1.34~~1.58	~~1.34~~1.58
Aircraft LTO	11.46	44.97	-	-	-	-
Total Operational Emissions	~~175.79~~164.99	~~399.72~~416.93	~~656.48~~556.03	~~1.74~~1.44	~~62.29~~9.66	~~19.69~~5.59
SJVAPCD Thresholds (tons/year)	10	10	100	27	15	15
Exceeds Thresholds?	Yes	Yes	Yes	No	~~Yes~~No	~~Yes~~No

Notes: ROG = reactive organic gases; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particular matter less than or equal 2.5 microns in diameter; ROG = reactive organic gases; LTO = landing and take-off; SJVAPCD = San Joaquin Valley Air Pollution Control District. ~~N~~ROG and NO_X are the most critical emissions associated with aircraft and, as a result, other criteria air pollutants are not reported.

[1] All emissions are shown in units of tons unless noted otherwise.

Source: AECOM 201~~6~~8

On page 3.2-30, of the Draft EIR, the following text has been incorporated into discussion of Impact 3.2-1:

To further reduce potential operational emissions associated with mobile sources, Mitigation Measure 3.2-1d would support the use of alternative transportation by future employees within the Specific Plan Area.

On page 3.2-30 of the Draft EIR, the label of Mitigation Measure 3.2-1b was revised (to be labeled Mitigation Measure 3.2-1c, instead) and the text was revised as shown below:

Mitigation Measure 3.2-1~~b~~c: ~~Encourage Alternatives to~~ Reduce the Single Occupant Vehicle Commute.

Policy Six of the Stanislaus County General Plan reads "The County shall strive to reduce motor vehicle emissions and vehicle trips by encouraging the use of alternatives to the single occupant vehicle." The project shall implement Policy Six through the incorporation of the following strategies or alternative strategies determined to be equally or more effective in reducing the rate of single-occupant vehicle commutes to the project site at buildout:

- Prior to the occupancy of the first building within the Crows Landing Industrial Business Park, a TDM or similar program shall be established or an existing program, such as the Commute Connection program, shall be designated to represent the project. The program will provide a comprehensive strategy to reduce solo occupant vehicle travel by employees, business vehicles including trucks, and visitors. The program shall identify TDM goals for CLIBP, including goals to reduce daily travel and travel during morning and afternoon peak-demand periods. The overall operational air pollutant emissions mitigation performance standard is established by the San Joaquin Valley Air Pollution Control District through Rule 9510, the Indirect Source Rule, requiring applicable projects to achieve a minimum reduction of 33.3 percent of operational baseline NO_X emissions over a period of 10 years and a minimum reduction of 50 percent of operational PM_{10} emissions over a period of 10 years. TDM goals for CLIBP shall be established, monitored, and adjusted, if necessary, to contribute to this overall operational air pollutant emissions mitigation performance standard.

- The CLIBP TDM program shall require mandatory annual employee surveys with a response rate of at least 90 percent. The surveys will include, as a minimum, mode and time of travel by employees. The CLIBP TDM program shall prepare an annual report indicating status of compliance with the TDM goals established by the County.

- The individual companies and the CLIBP TDM program shall consider the following items or other measures to reduce travel demand and achieve TDM goals:

    - Encourage employers to use flex-time
    - Carpool matching programs
    - Preferred parking for carpoolers
    - Van pool programs
    - On-site facilities such as break rooms and shower facilities
    - Establishment of employer sponsored shuttles from Turlock and Modesto
    - On-site secure bicycle racks
    - Bike share programs for employee usage at lunchtime
    - Other measures

- All employers operating within the Specific Plan Area shall participate in the TDM or Commute Connection program or future program providing the same services to allow employees to conveniently identify non-single occupancy vehicle methods to reach the proposed project site. Employers should not be considered as separate entities, but rather the entire site shall be considered collectively as a participating entity. The requirement to participate in the Commute Connection program shall be included in leases for Specific Plan developments. A person(s) shall be assigned to represent CLIBP on an ongoing basis to coordinate with individual businesses.

- New development projects that anticipate 100 or more full-time equivalent employees shall coordinate participation in the Commute Connection program or similar future program to reduce employee commute trips and to promote transportation other than the single passenger motor vehicle, including, but not limited to carpools, vanpools, buspools, public transit, and bicycling. The employee commute trip reduction program should include incentives, services, and policies. This program shall include preferential parking in relatively more convenient locations for electric vehicles, carpools, vanpools and other vehicles carrying commuter passengers on a regular basis.

- The County shall identify and accommodate at least one transit stop or commuter shuttle to serve the project site that would provide feasible commuter service for project employees.

Implementation: Stanislaus County and leaseholder/developer/contractors.

Timing: Demonstrate compliance prior to issuance of business license.

Enforcement: Stanislaus County.

On page 3.2-31, the following new mitigation measure was incorporated to reduce Impact 3.2-1:

<u>Mitigation Measure 3.2-1d: Provide Transit to the Workplace.</u>

- <u>The County shall ensure that the placement and design of transit stops can accommodate public transit for employees and patrons. The County shall identify locations to expand services, including park and ride lots, to enable and encourage the use of transit to the workplace within the Crows Landing Specific Plan Area. The placement and design of transit stops within the Specific Plan Area shall be approved by the Stanislaus County Public Works Department based on generally accepted transit planning principles.</u>

- <u>The County shall ensure on-demand transit service to the Specific Plan Area once employment generating uses are established within the Specific Plan Area and fixed transit service upon completion of Phase 2.</u>

- <u>The overall operational air pollutant emissions mitigation performance standard is established by the San Joaquin Valley Air Pollution Control District through Rule 9510, the Indirect Source Rule, requiring applicable projects to achieve a minimum reduction of 33.3 percent of operational</u>

baseline NO_X emissions over a period of 10 years and a minimum reduction of 50 percent of operational PM_{10} emissions over a period of 10 years. Transit to the Specific Plan Area shall be established, monitored, and adjusted, if necessary, to contribute to this overall operational air pollutant emissions mitigation performance standard.

Implementation: Stanislaus County.

Timing: Upon operation of employment-generating uses for on-demand transit and fixed transit service upon completion of Phase 2.

Enforcement: Stanislaus County.

On pages 3.2-31 and 3.2-32, the following text was revised to reflect the re-labeling of Mitigation Measure 3.2-1b and the addition of Mitigation Measure 3.2-1d:

Significance after Mitigation

Compliance with SJVAPCD's ISR (Rule 9510) would reduce operational impacts. The County requires projects to comply with applicable SJVAPCD rules, including Rule 9510. Compliance with regulations and implementation of Mitigation Measure 3.2-1bc would help reduce long-term operational air quality emissions associated with the proposed project. Mitigation Measures 3.2-1~~b~~c and 3.2-1d would include measures to reduce VMT and vehicle trips, which would help reduce long-term operational exhaust-related ROG, NO_X, CO, PM_{10}, and $PM_{2.5}$ emissions. Trip and VMT reduction would also reduce entrained PM_{10} and $PM_{2.5}$ road dust emissions. However, even with inclusion of these potential emissions reductions, it is anticipated that the proposed project's long-term emissions would continue to exceed SJVAPCD thresholds of significance. There is no additional feasible mitigation available to the County that would reduce this impact. Therefore, even with implementation of mitigation measures, the proposed project's operational emissions could violate or contribute substantially to an existing or projected air quality violation. As noted previously, the Specific Plan would accommodate employment options in three of the five industries where there is the most out-commuting by residents, which could provide some air quality benefit, although it is not possible at this time to quantify this potential benefit. This impact would be significant and unavoidable.

On page 3.2-32, Mitigation Measure 3.2-2a was revised to reflect the division of Draft EIR Mitigation Measure 3.2-1a in to Mitigation Measures 3.2-1a and 3.2-1b, as noted above, to clearly distinguish enforcement associated with the mitigation measure:

Mitigation Measure 3.2-2a: Implement Mitigation Measure 3.2-1a and Mitigation Measure 3.2-1b.

Compliance with regulatory requirements and the implementation of Mitigation Measure 3.2-1a and Mitigation Measure 3.2-1b would reduce on-site construction-related air quality emissions.

On page 3.2-34 of the Draft EIR, the following revision was made to Mitigation Measure 3.2-2b and the discussion under the heading, "Significance after Mitigation," to reflect the change to the mitigation label.

Mitigation Measure 3.2-2b: Implement Mitigation Measure 3.2-1~~b~~c.

Significance after Mitigation

Implementation of Mitigation Measure 3.2-1~~b~~c would help reduce long-term operational air quality emissions associated with the proposed project.

On pages 3.2-35 and 3.2-36 of the Draft EIR, the following revision was incorporated into the discussion of Impact 3.2-3, Mitigation Measure 3.2-3a and the "Significance after Mitigation" discussion to reflect the division of Draft EIR Mitigation Measure 3.2-1a in to Mitigation Measures 3.2-1a and 3.2-1b, as noted above, to clearly distinguish enforcement associated with the mitigation measure:

Table 3.2-8 presents construction emissions with implementation of Mitigation Measure 3.2-1~~a~~b, which would help reduce diesel PM emissions. However, because construction activities would occur in later years when fleet turnover and incorporation of higher tier (less polluting) equipment into construction fleets has already occurred, reductions associated with Mitigation Measure 3.2-1~~a~~b would not be as substantial in future years. It is anticipated that increased emissions control technology and standards will occur in the future; however, at the time of this writing and development of CalEEMod, these standards are not yet feasible to model. Thus, because there are sensitive receptors in the vicinity of the project site that could be exposed to the total proposed project's construction-related TAC emissions and the unknown nature of construction activities, it is conservatively assumed that construction activities could potentially expose receptors to substantial TAC concentrations and this impact is considered potentially significant.

Mitigation Measure 3.2-3a: Implement Mitigation Measure 3.2-1~~a~~b.

Significance after Mitigation

Implementation of Mitigation Measure 3.2-1~~a~~b requires the use of current phase construction equipment. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) and engine manufacturers are now required to meet after-treatment-based exhaust standards for NO_X and PM starting in 2011 that are more than 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines. The impact is less than significant with mitigation.

On page 3.2-36, the following text was incorporated into discussion of Impact 3.2-3. The additional text was provided to expand the discussion of potential exposure of sensitive receptors to emissions of toxic air contaminants from aircraft operations:

Operational Emissions

The proposed project would accommodate commercial and light industrial land uses, as well as aviation land uses, that could generate TAC emissions. Potential TAC emissions associated with the proposed land uses include stationary sources, manufacturing processes, and mobile sources, such as aircraft and diesel-fueled heavy-duty trucks associated with goods distribution. To a lesser extent, proposed land uses could also involve visitors and employees coming to and from the project site in diesel-fueled vehicles.

Aviation land use is consistent with the proposed CLIBP Specific Plan. This type of use could result in emissions of TACs from aircraft operations. Generally, approximately 10 percent of aircraft emissions are emitted close to the ground surface (less than 3,000 feet above ground level). and the remaining 90 percent of emissions are emitted at altitudes above 3,000 feet. As an exception to this, approximately 30 percent of CO and hydrocarbon (HC) emissions are produced at altitudes below 3,000 feet (FAA 2015). The proposed project does not propose residential uses, but it is possible that certain areas could include daycare centers for employees' children, which would be considered sensitive land uses. These receptors and existing sensitive receptors surrounding the project site could be exposed to aircraft emissions.

Similar to vehicles, aircraft engines and jet fuel are regulated to limit harmful emissions. The potential health impacts of these emissions have been of particular focus in recent research and regulations pertaining to the aviation industry, which have focused on strategies to reduce aircraft emissions. For example, ASTM D7566-18 was revised and approved in 2011 to include provisions for inclusion of up to 50 percent bio-derived synthetic fuel components with conventional jet fuel, increasing use of cleaner, alternative fuels in aviation. In addition, in 2012, the Federal Aviation Administration (FAA) published the Aviation Environmental and Energy Policy Statement, which asserts FAA's commitment to "environmental protection that allows sustained aviation growth" (FAA 2015).

Proposed aviation land use would initially include up to 2,000 annual aircraft operations (4,000 landing-take offs [LTOs]), with the potential for growth up to 17,000 annual aircraft operations (34,000 LTOs) in 30 years. The level of operations at the proposed airport are extremely low relative to the average airport operations in California, which was approximately 128,000 operations per airport in 2016 (FAA 2018). Given the anticipated level of operations at the Specific Plan Area, a comparison with another airport could be helpful in better understanding potential impacts. Planning for improvements to the Sonoma County Airport took place in 2011 and included evaluation of the existing inhalation cancer risk and acute, 8-hour, and chronic non-cancer hazard index for surrounding receptors (Sonoma County 2011). Average temperature throughout the year in Sonoma County is similar to that in Stanislaus County. The rainy season is relatively similar to that of Stanislaus County, although Sonoma County does tend to receive more rain during the rainy season of November through March. The air quality assessment for the Sonoma County Airport used mixing height data from Oakland, California, which is also the nearest data station to the Specific Plan Area (US EPA 1972). The assessment was for up to 90,660 annual operations, with a mix of about 7 percent jet aircraft, 89 percent piston aircraft, and 4 percent helicopter operations. The jet and piston operations are similar to those proposed for the Specific Plan Area. Sensitive receptors considered for the model ranged in distance from the runways from about 1,000 feet to over 1.5 miles, in all directions. The analysis for Sonoma County Airport shows that the inhalation cancer risk would not exceed 20 in a million at any receptor, the 8-hour and chronic non-cancer hazard index would not exceed 1, and that acute non-cancer hazard index for the nearest receptors could slightly exceed 1 for eyes and respiratory system, which could cause irritation or exacerbation of pre-existing asthma and allergies. This analysis is for operations over five times those of the proposed project. Therefore, it is highly unlikely that health risks associated with aircraft operations of the proposed project would exceed SJVAPCD thresholds of significance for TACs.

SECTION 3.6, ENERGY

On page 3.6-6 of the Draft EIR, the following discussion of "Methods of Analysis" was revised to reflect the use of a revised emissions model:

> The County conducted an evaluation of potential energy impacts using the California Emissions Estimator Model (CalEEMod), Version ~~2013.2.2~~2016.3.2, the *California Energy Demand 2010–2020, Adopted Forecast* (CEC 2009), as well as documents and regulations pertaining to the proposed project. Future energy demand was calculated based on proposed land uses and modeling conducted by AECOM for the greenhouse gas inventory using the CalEEMod, Version ~~2013.2.2~~2016.3.2.

On page 3.6-6, Table 3.6-3, the emissions estimates were revised to incorporate data using CalEEMod, Version 2016.3.2:

Table 3.6-3
Estimated Electrical and Natural Gas Demand from Implementation of the Proposed Project

Land Use Type	Electrical Demand (kWh/year)	Natural Gas Demand (kBtu/year)
General Light Industrial	~~130,197,000~~118,876,000	~~293,281,000~~281,226,000
Government Office Building/Public Facilities	~~6,810,760~~6,748,800	~~9,233,560~~9,657,000
Refrigerated Warehouse	~~151,197,000~~148,339,000	~~952,800~~893,250
Office	~~30,134,700~~27,132,800	~~55,685,100~~53,009,100
Total	**~~318,339,460~~301,096,600**	**~~359,152,460~~344,785,350**

Notes: kWh = kilowatt-hours; kBtu = thousand British thermal unit
Source: Data compiled by AECOM in 2015 and 2018

On page 3.6-7, the following discussion associated with Impact 3.6-1 was updated to reflect the revised data in Table 3.6-3:

> The proposed project's annual electrical and natural gas demand would be approximately ~~318.34~~301 million kWh and approximately ~~359,152.46~~345.35 million British thermal units (MMBtu).

SECTION 3.7, GREENHOUSE GAS EMISSIONS

On page 3.7-10, the "Methodology" discussion was revised to identify the use of a new version of the emissions model:

> The proposed project's GHG emissions were estimated using similar methods as those described in Chapter 3.2, "Air Quality." In addition to criteria air pollutants, CalEEMod Version ~~2013.2.2~~ 2016.3.2 and Sacramento Metropolitan Air Quality Management District's Roadway Construction Emissions Model Version 7.1.5.1 can also estimate GHG emissions associated with construction and operational activities.

On page 3.7-16, Table 3.7-3 was updated to included revised emissions estimates using CalEEMod Version 2016.3.2:

Table 3.7-3
Construction-Related GHG Emissions

Construction Phase/Year	Emissions (MT CO_2e)
Phase 1 Subtotal	~~83,229~~92,894
Phase 2 Subtotal	~~21,969~~26,493
Phase 3 Subtotal	~~4,416~~30,972
Total Construction Emissions	**~~109,613~~150,359**
Annual Average Construction Emissions	**~~3,654~~5,012**
Amortized Construction Emissions[1]	~~3,654~~5,012

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Totals may not appear to add exactly due to rounding.

[1] Construction emissions were amortized over 30 years.

Source: AECOM 2016~~6~~8

On page 3.7-17, Table 3.7-4 was updated to include revised emissions estimates using CalEEMod Version 2016.3.2:

Table 3.7-4
Operational GHG Emissions

Emissions Source	Emissions (MT CO_2e/yr)
Area	~~0.42~~0.43
Energy	~~19,332~~126,749
Mobile	~~65,902~~64,475
Waste	~~11,419~~12,654
Water	~~6,251~~17,143
Transport Refrigeration Units	~~50,469~~59,804
High-GWP Refrigerants	19,180
Aircraft	175
Total Operational Emissions	**~~175,118~~301,609**
Amortized Construction Emissions[1]	~~3,654~~5,012
Total Annual Proposed Project Emissions[2]	**~~178,772~~306,621**
Project GHG Efficiency (emissions per service population)[3]	**~~11.76~~20.44**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; yr = year

Totals may not appear to add exactly due to rounding.

[1] Construction emissions were amortized over 30 years, which is the assumed lifetime of the proposed project. See Table 3.7-1 for detailed construction GHG emissions.

[2] The proposed project's total annual emissions include annual operational emissions added with construction emissions amortized over 30 years.

[3] The proposed project is anticipated to provide approximately 14,000 to 15,000 jobs at full buildout.

Source: AECOM 2016~~6~~8

SECTION 3.8, GEOLOGY, SOILS, MINERALS, AND PALEONTOLOGICAL RESOURCES

On page 3.8-4 and 3.8-19 of the Draft EIR, a typo related to measured instantaneous subsidence rates has been corrected:

> Surveying conducted in support of this program indicates that the average subsidence rate near the project site has been in the range of 0 to ~~01.5~~ 0.15 feet per year between December 2011 and December 2015 (USBR 2016). Surveys conducted between December 2012 and December 2013 indicate slightly accelerated short term subsidence rates during that time period between 0.15 and 0.3 feet per year (USBR 2014).

This does not affect the analysis, findings, or mitigation in the EIR.

SECTION 3.9, HAZARDS AND HAZARDOUS MATERIALS

On page 3.9-7 of the Draft EIR, the following text has been incorporated into the "Environmental Setting" discussion:

> **Former Oil Pipelines**
>
> The former Old Valley Pipeline (OVP) and Tidewater Associated Oil Company (TAOC) pipelines may be present along State Route (SR) 33. Therefore, one or both of these pipelines may be located underground at the northeast corner of the project site. OVP and TAOC pipeline operations ceased in the 1940s and 1970s, and when pipeline operations ceased, the pipelines were taken out of commission. However, the degree and method of decommissioning varied: in some instances the pipelines were removed, while others remained in place. The OVP and TAOC pipelines were installed to depths of 10 feet below ground surface. The steel pipelines were typically encased in a protective coating composed of coal tar and ACMs (Oliphant, pers. comm., 2018).

On page 3.9-18, of the Draft EIR, the following text and mitigation measure has been imposed on an impact that is already less than significant:

> However, the County has imposed the following mitigation measure to formalize the official route for trucking access to the Specific Plan Area.
>
> > Mitigation Measure 3.9-1: Designate Official Trucking Route.
> >
> > The County shall designate the official trucking terminal access route for the Specific Plan from the Fink Road/Interstate 5 interchange directly to the Specific Plan Area. This trucking route shall apply to large trucks regulated by the Surface Transportation Assistance Act, referred to as STAA trucks.

Implementation: Leaseholders/developers/contractors.

Timing: Establish prior to construction and enforce during construction and operation of projects implemented within the Specific Plan Area.

Enforcement: Stanislaus County.

On page 3.9-23, of the Draft EIR, the following additional text has been incorporated into the discussion of Impact 3.9-2:

Former Oil Pipelines

The Chevron Environmental Management Agency (Oliphant, pers. comm., 2018) conducted risk assessments at numerous locations with known historical crude-oil release points along the former OVP and TAOC pipelines. Analytical results from these risk assessments indicated that the crude-contaminated soil was non-hazardous. Accordingly, if soil affected by the historical release of crude oil from these former pipelines is encountered during construction activities at the northeast corner of the project site, it may be reused as backfill on site. Furthermore, properly abandoned crude-oil pipeline may be left in the ground. Therefore, this impact is considered **less than significant**. No mitigation is required.

SECTION 3.10, HYDROLOGY AND WATER QUALITY

On page 3.10-22, the following text has been added to the "Regulatory Framework" discussion:

Locally established GSAs are part of the Northern Delta-Mendota Management Committee, and include the City of Patterson GSA, DM-II GSA, North-Western GSA, Patterson Irrigation District GSA, and West Stanislaus Irrigation District – 1 & 2 GSAs. Together with other GSAs established in the central and southern portions of the subbasin, they encompass an area of more than 320,000 acres within the counties of Stanislaus, Merced, and Fresno. Their boundaries are as follows: the western boundary generally follows the Coast Range, the eastern boundary is the San Joaquin River in Stanislaus County and the water district boundaries in Merced and Fresno counties, the northern boundary is located to the south of the City of Tracy, and southern boundary is the northern perimeter of the Westside subbasin. In February 2017, the Northern Delta-Mendota Management Committee and the Central Delta-Mendota Management Committee began coordinating with the SLDMWA to obtain coordinated access to administrative and technical resources through the San Luis & Delta-Mendota Water Authority to comply with the sustainable management of groundwater pursuant to SGMA.

On page 3.10-44, the following clarification has been made to Mitigation Measure 3.10-4b:

Mitigation Measure 3.10-4b: Conduct and Report Groundwater Level Monitoring

The County shall coordinate with the Groundwater Sustainability Agency to conduct ~~prepare on~~ groundwater monitoring ~~conducted~~ as a part of implementation of the Groundwater Sustainability Plan for the vicinity of the Specific Plan Area. The exact construction, placement, and monitoring methodology will be defined in a groundwater level monitoring program in the Groundwater Sustainability Plan. Groundwater level monitoring activities, findings, and reporting schedule will also be defined in the Groundwater Sustainability Plan, along with the Minimum Thresholds and Measurable

Objectives required in a Groundwater Sustainability Plan that govern when investigation and intervention is required and what adjustments to well field operation or other actions are required to avoid effects to existing off-site wells. Groundwater level monitoring shall commence prior to project implementation to establish baseline conditions.

SECTION 3.11, LAND USE AND PLANNING AND POPULATION, HOUSING, AND EMPLOYMENT

The following revision has been made on page 3.11-19 to Impact 3.11-4 in Section 3.11, "Land Use and Planning and Population, Housing, and Employment," of the Draft EIR.

The purpose of the proposed project is to reuse the former Crows Landing military facility to create a regional employment center that will provide local job opportunities to the residents of Stanislaus County, some of whom may be unemployed at the time jobs are available at the project site. In addition, as described in Chapter 2, "Project Description," one of the objectives of the project is to provide sustainable-wage jobs. CLIBP employees could reside in communities near the Specific Plan Area, such as the cities of Patterson and Newman, and along the Interstate 5 and State Route (SR) 33 corridors. Because the proposed project is located along primary transportation corridors, CLIBP employees also could be drawn from adjacent San Joaquin and Merced counties. There is existing housing in communities located along these corridors that could potentially serve employees.~~,~~ ~~and o~~ <u>O</u>ver the 30-year buildout of the project, ~~it is likely that~~ additional housing opportunities will be developed.

SECTION 3.13, PUBLIC SERVICES

The language from the County's General Plan has been added on page 3.13-3:

Land Use Element

- **GOAL FOUR –** Ensure that an effective level of public service is provided in unincorporated areas.

- **POLICY TWENTY-FOUR –** Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, public safety, solid waste management, road systems, schools, health care facilities, etc.

- **IMPLEMENTATION MEASURE 1 –** The County shall continue to implement its Public Facilities Fees Program, which is intended to help finance public facilities needed to maintain current levels of service.

- **IMPLEMENTATION MEASURE 3 –** Benefit assessment districts, County Service Areas (CSAs), Mello-Roos Districts, or other similar districts shall be formed as needed to pay for the cost of providing ongoing appropriate services.

- <u>**IMPLEMENTATION MEASURE 4 –** The County shall continue to work with independent fire districts and health care districts to implement fees to help finance public facilities to support their services.</u>

- <u>**GOAL FIVE –** Promote and protect healthy living environments.</u>

- **POLICY THIRTY-ONE –** The County shall support efforts to improve local health care options through the siting of new facilities in locations with the infrastructure (including, but not limited to, transportation and utility) to support both facility and client needs.

SECTION 3.14, TRAFFIC AND TRANSPORTATION

The following revisions were made to Mitigation Measure 3.14-1 in in Section 3.14, "Traffic and Transportation," of the Draft EIR:

Mitigation Measure 3.14-1: Off-site Traffic Signal or Roundabout Installations and Intersection Improvements.

The following intersections are expected to meet signal warrants during peak-hour periods when the project is in place. The impact can be alleviated by installing traffic signals at the intersections where LOS would be degraded in exceedance of relevant thresholds. The affected jurisdictions can consider roundabouts as an alternative to traffic signals. The project shall contribute on a fair-share basis to the following improvements.

Phase 1

- Signalize Intersection 14. Sperry Avenue / SR 33 (~~City of Patterson~~ Caltrans)
- Signalize Intersection 24. West Ike Crow Road / SR 33 (Stanislaus County)
- Signalize Intersection 26. Fink Road / Bell Road (Stanislaus County)
- Signalize Project Entrance / Fink Road (Stanislaus County)

Fink Road Interchange – Contribute on a fair-share basis to the improvement of the Fink Road interchange. Improvements recommended for the Fink Road interchange include signalizing the northbound ramps prior to completion of Phase 1 and widening the roadway beneath the freeway to create a westbound left turn lane at the southbound ramps intersection.

Phase 2

- Signalize Intersection ~~22~~ 20. Marshall Road / SR 33 (Caltrans)
- Signalize Intersection 22. Marshall Road / Ward Avenue (Stanislaus County)
- Signalize Intersection 25. Fink Road ~~at~~/ SR 33 (Stanislaus County)

Implementation: Leaseholders/developers/contractors will contribute on a fair-share basis to fee to reimburse for off-site improvements and implementation will be directed by Stanislaus County.

Timing: Prior to completion of Phase 1 and Phase 2, as specified.

Enforcement: Stanislaus County.

Significance after Mitigation

With the signalization of Intersections 24, 26, Project Entrance, 22, and 25, the resultant LOS would be LOS C or better. The impact at these intersections is considered **less than significant** with mitigation.

For Intersections 14 and 20, signalization would allow LOS of D or better. However, the County cannot guarantee that this improvement would be implemented since this would be under the jurisdiction of ~~the City of Patterson~~ Caltrans. This impact is **significant and unavoidable**.

SECTION 3.15, UTILITIES AND SERVICE SYSTEMS

On pages 3.15-2 and 3.15-3, the "Environmental Setting" discussion was revised to clarify the use of an acronym and correct the name of the resource cited:

Wastewater flows from the WHWD are discharged into the Patterson Trunk Sewer, which conveys sewer flows to the City of Patterson Water Quality Control Facility (WQCF) for treatment (Stanislaus Local Agency Formation Commission [LAFCO] 2016:5). The City of Patterson owns and operates the 240-acre WQCF, which is located approximately 9 miles north of the project site at 14901 Poplar Avenue. The WQCF provides wastewater ~~transmission,~~ treatment~~,~~ and disposal for both the City of Patterson and the community of Diablo Grande. The City of Patterson WQCF has a current design capacity of 2.25 million gallons per day (mgd) average dry-weather flow, but it has a reliable treatment capacity of 1.85 mgd (~~Blackwater~~ Black Water Consulting Engineers 2017).[1] As of 2016, the WQCF treats 1.44 mgd average dry-weather flow (~~Blackwater~~ Black Water Consulting Engineers 2017). The City anticipates that flows to the WQFC at buildout of all known planned development within the City of Patterson, its sphere of influence, and the community of Diablo Grande would exceed the design capacity of the treatment plant. Table 3.15-2 shows the estimated WQCF average dry-weather flow at buildout of the City of Patterson and Diablo Grande.

Table 3.15-2
Estimated City of Patterson Water Quality Control Facility Average Dry-Weather Flow (mgd)

Year	City of Patterson	Diablo Grande	Total
2018	1.51	0.05	1.56
2029	2.15	0.11	2.26
2040	2.49	0.16	2.65
2050	2.80	0.22	3.02
Buildout	5.54	0.75	6.29

Note: mgd = million gallon per day
Source: ~~Blackwater~~ Black Water Consulting Engineers 2017

The City has prepared improvement plans ~~and acquired land~~ to expand the WQCF capacity. WQCF expansion, generally referred to as the Phase III Expansion, would increase the plant capacity by 1.25 mgd to bring the total plant capacity to 3.5 mgd with a reliable treatment capacity of 3.1 mgd (Central Valley Regional Water Quality Control Board 2007, ~~Blackwater~~ Black Water Consulting Engineers 2017). The Central Valley Regional Water Quality Control Board has already authorized expansion of the facility under Order R5-2007-0147, which was issued in November of 2007 (Central Valley Regional

[1] The existing reliable capacity for the WQCF differs from the permitted capacity. The WQCF's waste discharge requirements identified in Central Valley Regional Water Quality Control Board Order R5-2007-0147 include effluent nitrogen limits that have been challenging for the older treatment facilities at the WQCF to meet. Therefore, the City of Patterson considers the reliable capacity of the WQCF to be less than the permitted capacity to ensure compliance with the waste discharge requirements.

Water Quality Control Board 2007). Additional WQCF expansion will be required to treat wastewater flows at buildout of the City of Patterson and Diablo Grande. Phase IV and Phase V expansions would increase the WQCF reliable treatment capacity to 4.25 mgd and 6.5 mgd, respectively (~~Blackwater~~ Black Water Consulting Engineers 2017). It is expected that future expansions would occur before the WQCF exceeds reliable capacity.

On page 3.15-10 of the Draft EIR, the following text in the discussion of "Methodology" was revised to provide additional clarity:

- *Technical Memorandum. Potential Impacts to Patterson Wastewater Facilities from Crows Landing Industrial Business Park (~~Blackwater~~ Black Water Engineering Consultants 2017)*

On pages 3.15-15 and 3.15-16, the following revisions have been incorporated into Impact 3.15-4:

Implementation of the proposed project would require construction of on-site wastewater collection and conveyance facilities. The *Crows Landing Industrial Business Park Sanitary Sewer Infrastructure and Facilities Study (*Sanitary Sewer Study*)* was prepared for the proposed project to identify wastewater collection and conveyance facilities design (VVH Consulting *Engineers* and AECOM 2016b).

Backbone wastewater collection and conveyance infrastructure facilities necessary to serve Phase 1 include gravity trunk mains, a 2.66-mgd sanitary sewer lift station southwest of the Marshall Road and State Route 33 intersection, a ~~0.065~~0.32-mgd sanitary lift station south of the airfield near the Delta Mendota Canal, and an 12-inch force main within Marshall Road to convey effluent to the existing off-site WHWD 18-inch trunk main in Ward Avenue. This temporary connection will be replaced with a permanent connection to the proposed South Patterson Trunk Sewer at the intersection of Bartch Avenue and Ward Avenue as part of Phase 2. The gravity trunk mains, lift station, and force main would be sized to accommodate effluent from Phases 1, 2, and 3 (VVH Consulting Engineers and AECOM 2016b:9).

The proposed South Patterson Trunk Sewer would be designed to have sufficient capacity to accommodate flows at buildout of the Specific Plan. The City of Patterson would correct the pipeline deficiencies in the Ward Avenue trunk line at the intersection of Ward Avenue and M Street and upsize existing 21-inch sewer pipes to 24 inches prior to serving the Specific Plan (VVH Consulting Engineers and AECOM 2016b:19). New wastewater infrastructure would be constructed per design criteria identified in the City's Wastewater Master Plan.

On pages 3.15-16 and 3.15-17, the following revisions have been incorporated into the discussion of Impact 3.15-5:

IMPACT 3.15-5	Increased demand at City of Patterson Water Quality Control Facility (WQCF). *Implementation of the proposed project would result in an increase in wastewater flows that exceed the current City of Patterson WQCF design capacity. This impact is considered* ***significant.***

Wastewater treatment for the proposed project is anticipated to be provided by the City of Patterson WQCF, which has a current design capacity of 2.25 mgd average dry-weather flow and a reliable treatment capacity of 1.85 mgd (~~Blackwater~~ Black Water Consulting Engineers 2017). As of 2016, the WQCF treats 1.44 mgd average dry-weather flow. The City has prepared improvement plans ~~and acquired~~

~~land~~ for WQCF expansion to achieve a design capacity of 3.5 mgd, with a reliable capacity of 3.1 mgd.

Phases 1, 2, and 3 of the project could generate an average dry-weather flow of 0.394 mgd, 0.223 mgd, and 0.274 mgd, respectively, for a total of 0.891 mgd average dry-weather flow at site buildout (~~Blackwater~~ Black Water Consulting Engineers 2017). This estimate is based on accepted industry standard loading factors and input from the County of Stanislaus and the City of Modesto. The estimate is conservative and does not consider California Green Building Standards or the Specific Plan policies that reduce water use. Section 5.303 of the California Green Building Standards covers indoor water use and includes policies to reduce the overall use of potable water by 20 percent. Section 5.304 covers outdoor water use and requires irrigation controllers and sensors to reduce water use. Compliance with the California Green Building Standards would reduce water use and associated wastewater generation. The Specific Plan also promotes water efficiency and conservation, by encouraging energy star appliances, water sensitive design techniques, individual water metering, drought-tolerant and native plant landscaping, and by making reclaimed water available for cooling and other industrial uses.

The City of Patterson did not account for the project's wastewater flows in its planned design expansion to 3.5 mgd. Wastewater treatment capacity is allocated on a "first come, first serve" basis. Early phases of development would generate wastewater flows that could be accommodated by on-site septic systems, as described above in Impact 3.15-4, or by the WQCF, if sufficient capacity is available. Because there are other approved and planned projects in the Patterson area, it is possible that capacity may need to be added to the WQCF to serve one or more phases of the proposed project, should these other projects break ground before the proposed project. The City's Wastewater Master Plan examines alternatives to expansion of the WQCF to handle 7.0 mgd and serve 76,000 residents, 675 acres of commercial development, and 2,227 acres of industrial development. Subsequent projects and leasehold development would be required to pay fair-share fees to the City of Patterson for wastewater treatment. Capacity expansion for the WQCF could be required to provide for the proposed project's long-term wastewater treatment demands. This impact is considered **significant**.

On page 3.15-17, the description of Mitigation Measure 3.15-5 was revised to provide greater clarity:

Mitigation Measure 3.15-5: Demonstrate Adequate Wastewater Treatment Capacity.

Before the County will issue any building permit for a use proposing to connect to public sewer or construction of backbone sewer infrastructure connecting to the WHWD sewer line, the project applicant ~~will~~ shall be required to provide written documentation to verify that existing treatment capacity is, or will be, available at the WQCF to support the proposed development. If treatment capacity is provided at the City of Patterson WQCF, projects within the Specific Plan Area shall contribute on a fair-share basis to the cost associated with such treatment capacity. Written documentation may include proof of executions of all financing agreements and/or other mechanisms, to the satisfaction of the City of Patterson, to ensure ~~and~~ that any physical improvements required to treat wastewater associated with the proposed development will be in place prior to occupancy.

Implementation: Leaseholders/developers/contractors.

Timing: Prior to issuance of any building permits.

Enforcement: Stanislaus County.

CHAPTER 4, ALTERNATIVES

Alternative 2 would reduce the scale of the Specific Plan and wastewater demand requiring treatment at the City's WQCF. Table 4-5 in Chapter 4, "Alternatives," of the Draft EIR has been revised accordingly. This edit does not change the analysis or conclusions of the Draft EIR.

Table 4-5
Comparison of Infrastructure Improvements Needed

Type	Alternative 2	Proposed Project
Dry Utilities (Electricity, Natural Gas, Communications)	Utility service would be provided by Pacific Gas & Electric Company (PG&E) (natural gas), Turlock Irrigation District (TID, electric) and AT&T (communications). Utilities would be located in joint trenches along the western or southern sides of on-site roadways.	Same as Alternative 2.
Sewer	Alternative 2 would require the construction of gravity trunk mains, a 2.66-Million Gallons per Day (MGD) sanitary sewer lift station southwest of the Marshall Road and State Route 33 intersection, a ~~0.065~~<u>0.32</u>-MGD sanitary lift station south of the airfield near the Delta Mendota Canal, and a force main within Marshall Road to convey effluent to the existing Western Hills Water District (WHWD) trunk main in Ward Avenue. <u>Less development under Alternative 2 would generate less wastewater as compared to the proposed project.</u>	Same as Alternative 2, plus the construction of a force main to convey sewage from the site to the City of Patterson wastewater treatment facility.
Storm Drainage	To accommodate flows on Little Salado Creek, an existing channel south of the airport would be improved. The existing box culverts would be replaced by three 4-by-8-foot box culverts to convey flows beneath the runway.	Same as Alternative 2, plus the creation of a detention basin in the northeast corner of the project site to detain flows.
Water	On-site groundwater wells and wellhead treatment would fulfill site demand. Under Alternative 2, existing on-site groundwater wells would be developed with a wellhead treatment system to provide water to the Fink Road Corridor, Bell Road Corridor, airport, and 15 acres of the Public Facilities area. Infrastructure development would include distribution pipes and valves, the construction of a water storage tank east of the intersection of Davis and Fink roads, and a well booster pump station. As with the proposed project, Alternative 2 could potentially connect with the City of Patterson water system or the Crows Landing Community Services District for blending or redundancy, but not for water supply.	Same as Alternative 2, plus additional infrastructure (pipes, valves, a water tank, and pump station). The project could potentially connect with the City of Patterson water system or the Crows Landing Community Services District for blending or redundancy, but not for water supply.
Roadways	See above under the heading "Traffic and Transportation."	See above under the heading "Traffic and Transportation."

CHAPTER 5, OTHER CEQA CONSIDERATIONS

On page 5-32, Table 5-5, the following revisions have been made to Intersections 9 and 13. This does not affect the findings or mitigation measures in the Draft EIR.

Table 5-5
Intersection Level of Service: 2035 No-Project and 2035 plus Project Conditions

Intersection		Traffic Control Type	2035 No-Project				2035 plus Project			
			A.M. Peak		P.M. Peak		A.M. Peak		P.M. Peak	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9	Ward Avenue / M Street	Signalized	35.5	D	33.3	C	48.0	D	~~97~~ 38.9	~~F~~D
13	Las Palmas Avenue / SR 33	Signalized	21.0	C	21.0	C	30.6~~6.0~~	C	24.1	C

The following revisions were made starting on page5-34 of the Draft EIR to Mitigation Measure Cumulative with Project Transportation 1: Traffic Signal Installation and Cumulative with Project Transportation 2: Roadway Widening and text explaining the traffic analysis as it relates to the City of Newman. These revisions do not affect the findings in the Draft EIR.

Mitigation Measure – Cumulative with Project Transportation 1: Traffic Signal Installation

The project shall contribute on a cumulative fair-share basis to the signalizations for Intersections 1, 2, 10, 11, 14, 17, 18, 19, 20, and 25. The project shall also contribute on a cumulative fair-share basis to the signalization of the following intersections:

- Fink Road / Davis Road (Stanislaus County)
- Fink Road / Ward Avenue (Stanislaus County)
- I-5 NB Ramps/ Fink Road (Caltrans)
- I-5 SB Ramps/ Fink Road (Caltrans)
- SR 33 intersections with Stuhr Road, Jensen Road, Yolo Street, and Inyo Street.

Implementation: County of Stanislaus / Caltrans

Timing: Prior to completion of Phase 3

Enforcement: County of Stanislaus Public Works Department / Caltrans

The Transportation Master Plan, under separate cover and available for review on file with the County Planning and Community Development Department, presents estimates of the project's fair share of the cost of each of these improvements. The calculation of the project's fair share may change based on planning and development that could occur between the present time and buildout of the project. With signalization of the intersections of Fink Road and Davis Road, Fink Road and Ward Avenue, I-5 NB Ramps and Fink Road, and I-5 SB Ramps and Fink Road, the resultant LOS would be LOS C or better. The Fink Road/Davis Road and Fink Road/Ward Avenue intersection improvements would occur under the jurisdiction of the County. The impact is **less than cumulatively considerable with mitigation**.

The I-5 northbound ramps/Fink Road intersection and I-5 southbound ramps/Fink Road intersection are under Caltrans' jurisdiction. The County cannot guarantee that these improvements would be implemented. There is no additional feasible mitigation. This cumulative impact is considered **significant and unavoidable**.

For the fair-share contributions to recommended improvements identified for the cumulative without project scenario, LOS C or better would be achieved at the intersections of Carpenter Road and West Main Street, Crows Landing Road and West Main Street, and Crows Landing Road and Marshall Road. City of Newman traffic studies indicate that future traffic signals in the SR 33 corridor in and near Newman will include intersections at Stuhr Road, Jensen Road, Yolo Street, and Inyo Street. The Specific Plan will contribute on a fair-share basis to signalizations of these intersections. In addition, although signalization would achieve LOS C or better for the intersections of I-5 southbound ramps and Sperry Road, I-5 northbound ramps and Sperry Road, Ward Avenue and SR 33, Olive Avenue and SR 33, Sperry Avenue and SR 33, Marshall Road and SR 33, and Fink Road and SR 33, each of these improvements is under Caltrans' jurisdiction and the County cannot ensure implementation. The impact is considered **significant and unavoidable**.

Roadway Segment Operations

With the addition of project-related traffic to cumulative conditions, additional roadway segments will fall below relevant LOS thresholds. The impact is **cumulatively considerable**.

Mitigation Measure – Cumulative with Project Transportation 2: Roadway Widening

The project shall contribute on a cumulative fair-share basis to the improvement to Roadway Segment 16, West Main Street west of Carpenter Road: from two to four lanes, and the improvement to Roadway Segment 19, I-5 north of Sperry Avenue: from four to six lanes. The project shall also contribute on a cumulative fair-share basis to the following roadway widening improvements:

- Roadway Segment 4. SR 33 south of Stuhr Road~~, north of Newman~~ to Inyo Street: from two to four lanes
- Roadway Segment 8. SR 33 between Marshall Road and Sperry Avenue: from two to four lanes
- Roadway Segment 20. I-5 between Fink Road and Sperry Avenue: from four to six lanes

Implementation: Caltrans / County of Stanislaus

Timing: Prior to completion of Phase 3

Enforcement: Caltrans / County of Stanislaus Public Work Department

The Transportation Master Plan (under separate cover and available for review on file with the County Planning and Community Development Department) presents estimates of the project's fair share of the cost of each of these improvements. The calculation of the project's fair share may change based on planning and development that could occur between present and buildout of the project. Providing four lanes on SR 33 between the city of Newman and Stuhr Road would provide LOS D, as would four lanes between Marshall Road and Sperry Avenue. Adding two lanes to I-5 between Fink Road and Sperry Avenue would provide LOS B. However, the County cannot guarantee that these improvements would be implemented because they would be under the jurisdiction of Caltrans and would depend on the availability and prioritization of State and federal funds. There is no additional feasible mitigation available. This impact is **significant and unavoidable**.

For the fair-share contributions to roadway widenings identified under the cumulative no project scenario, a LOS of C or better would be achieved on West Main Street and East Las Palmas Road west of Carpenter Road and on I-5 north of Sperry Avenue. However, the County cannot guarantee that the improvements would be implemented for I-5 because these improvements would be under the jurisdiction of Caltrans and because the improvements would depend on the availability and prioritization of State and federal funds. This cumulative impact is **significant and unavoidable**.

Regarding the widening of SR 33, from Marshall Road to Sperry Avenue, this segment is 12,300 feet in length. In the city of Patterson, the four-lane section of SR 33 has a width of about 60 feet for four-lanes undivided plus parking on one side. Widening is needed by the completion of Phase 2 of the development when combined with 2035 growth traffic. During Phases 2 and 3 of the project, it may be worthwhile to consider adding a third center left turn lane at existing intersections to enhance both the safety and capacity of SR 33 and delay the need for four lanes.

For SR 33 south of Stuhr Road and north of the city of Newman, this section of roadway will exceed two-lane capacity by the end of Phase 3 of the project when combined with 2035 background traffic. SR 33 through Newman is planned in the City's General Plan ~~appears~~ to have an ultimate width of ~~three~~ four lanes south of Stuhr Road in and north of the existing ~~urbanized area~~ City limits. ~~If such a road section were extended north to Stuhr Road with signalization and other intersection improvements at Stuhr Road, this is anticipated to supply adequate capacity (TJKM 2017).~~ In the busiest location along SR 33, the Specific Plan will contribute approximately 7,700 vehicles per day (vpd). In this location, Specific Plan volumes would constitute 28 percent of the growth. If the traffic is split 50-50 to account for one trip end in Newman and one trip end in the Specific Plan Area, a reasonable fair share allocation for the impacts caused by Specific Plan traffic is approximately 14 percent. As stated in Mitigation Measure – Cumulative with Project Transportation 2, the Specific Plan will contribute on a cumulative fair-share basis to the widening of SR 33, south of Stuhr Road to Inyo Street, from two to four lanes.

Starting on page 5-37, the following clarifications have been made to the Draft EIR, which do not impact any findings or mitigation measures:

Water Supply

Implementation of the project would result in the increased demand for water supplies. Water supply for the project site would be provided through existing (non-potable) and new (potable) groundwater wells from the Delta-Mendota Groundwater Subbasin. Groundwater levels underlying or near the proposed project site appear to have minimal net change and appear to be hydrologically balanced (AECOM 2016). A groundwater contour map provided by DWR based on well data show that 2006 groundwater levels did not change markedly from 1996 levels (City of Patterson 2011). Some studies of groundwater elevations have shown some decline during recent years attributable to abnormally low rainfall throughout the state and increased groundwater pumping to meet demands that would normally be met from surface water sources, but that over time, groundwater elevations are relatively stable, which would indicate a hydrologically balanced condition (VVH Consulting Engineers and AECOM 2016). The hydrographs for State Well No.'s 06S08E20D002M and 06S08E09E001M span the period from 2011 to the present. In general, these hydrographs suggest that groundwater levels near the project site recover quickly after pumping ceases, as indicated by relatively consistent water elevations by season (see State Well No. 06S08E09E001M). Overall, water levels near the project site have been stable since 2011, which indicates that recent pumping rates near the project site have been sustainable on an annual basis, even during the drought (JJ&A 2016:3-3). Based on this information, significant cumulative effects related to groundwater level drawdown are not occurring or anticipated in or near the Specific Plan Area under current groundwater management conditions.

Based on groundwater modeling conducted for the Program Environmental Impact Report for the Stanislaus County Discretionary Well Permitting and Management Program (JJ&A 2018), the County estimates the total average surface water supply provided within the Delta-Mendota Subbasin north of the Merced River to be approximately 282,000 acre-feet/year. The total average groundwater supply provided in the Delta-Mendota Subbasin within the County (including district pumping, municipal pumping, and private pumping) is estimated to be approximately 148,000 acre-feet/year. Water suppliers in the Delta-Mendota Subbasin within the County include ~~The County has created four Groundwater Management Areas, including the North County, Modesto, Turlock, and the Westside Groundwater Management Areas. The project site is located in the West Side Area. The County has estimated the water supply in the Westside Area to be 383,000 acre feet per year (afy) (333,500 from surface supplies and 49,500 from groundwater supplies) (Stanislaus County 2008). Westside Area water suppliers include~~:

- City of Patterson
- City of Newman
- Del Puerto Water District
- Westley Community Services District
- Patterson Irrigation District
- Oak Flat Water District
- Western Hills Water District (outside the groundwater basin but receives surface water deliveries from the subbasin area)
- Crows Landing Community Services District
- West Stanislaus Irrigation District
- Eastin Water District
- Central California Irrigation District
- El Solyo Water District

Long-term groundwater demand forecasts associated with the above water agencies and with non-agency agricultural and domestic groundwater extraction are currently uncertain because the Groundwater Sustainability Plans (GSPs) required to comply with the Sustainable Groundwater Management Act (SGMA) are still being developed, and the outcome of other regulatory requirements that could profoundly affect the nature of water supply availability in the area (i.e., the Bay-Delta Water Quality Control Plan amendments proposed by the State Water Resources Control Board) are currently uncertain. Simulation of a range of long-term groundwater demand trends for the recently certified "Program Environmental Impact Report for the Discretionary Well Permitting and Management Program, Stanislaus County, California," under which the Specific Plan wells will be permitted, indicates that, in the absence of GSP implementation, there is a theoretical potential for groundwater levels to decline by tens of feet in some areas, depending on the amount and distribution of future groundwater extraction increases. Under such a scenario, the use of some existing wells could be adversely affected, groundwater supplies could become less economical and less available, and other adverse environmental, economic and societal effects could occur. However, development and implementation of GSPs under SGMA is required to mitigate such adverse effects, and to prevent "Undesirable Results," as defined in SGMA and in the County Groundwater Ordinance. GSPs will define the sustainable yield of the subbasin, identify any special management areas, define management objectives, criteria and thresholds, and establish monitoring networks. After GSPs are adopted, GSAs will be responsible for their implementation and enforcement, with specific requirements to avoid future Undesirable Results, and to ameliorate any existing Undesirable Results by 2042 in accordance with defined milestones. If GSAs fail to adopt adequate GSPs, or fail to adequately implement them, the SGMA requires the State to intervene to ensure that the sustainability requirements are met. The Groundwater Ordinance also allows the County to intervene and regulate unsustainable groundwater extraction prior to state intervention, providing an additional safeguard against unsustainable groundwater extraction. For these reasons, although the precise nature of the measures contained in local GSPs cannot yet be known, their effect on cumulative environmental impacts related to groundwater level decline and storage depletion are a regulatory certainty that will be enforced by both the State and the County. The actions required to be implemented by GSAs to comply with SGMA will decrease any cumulative effects resulting from groundwater extraction, avoiding a significant cumulative impact.

Water supply by the water agencies listed above occurs in a broader context than groundwater use alone, and involves surface water sources (deliveries from the State and federal water projects, diversions from the San Joaquin River, and use of reclaimed wastewater) and associated diversion, treatment and distribution systems. In addition, water deliveries may be affected by water exchange agreements between districts or their customers that include surface, as well as groundwater supplies, and by the Warren Act. This regional interdependence of supply and demand is made more complicated by the fact that the proposed amendments to the Bay Delta Water Quality Control Plan are not yet finalized, and their potential effects on regional supply and demand relationships are not yet known.

~~Additional agricultural water demand and urban demand, such as in the City of Patterson, would increase water demand, and projects that rely on groundwater may cause the groundwater levels to decline. Changes in agricultural practices could increase water demand or could increase groundwater recharge, depending on the soils, among other factors. Urban development of agricultural land with relatively higher water demand agricultural operations could represent a net decrease in water demand. The addition of impervious surfaces associated with urban development would decrease groundwater recharge in most cases.~~ At this time, the County is unable to determine how a water demand with the scale of the Specific Plan would interact with other regional demand and supply changes, and whether the cumulative changes could adversely affect the water supply systems of the cities, community service districts, water districts, and irrigation districts listed above, either by affecting the water demand those systems must serve, or through changes in the amount of or sources of water supplies available to them. ~~whether changes in agricultural practices and development in the Westside Area would increase water demand and reduce groundwater recharge so that supplies become unsustainable.~~ Considering the magnitude of development included in the cumulative context, the County conservatively assumes there could be a **significant cumulative impact**.

A water supply assessment (WSA) was prepared in compliance with SB 610 to determine whether the projected available water supplies would meet the project's water demand. The total projected water demand based on proposed land uses in the project site at buildout is an estimated 2,819 afy. The WSA concluded that the proposed potable and non-potable groundwater wells would be sufficient to meet the water supply demands of the proposed project in normal, single-dry, and multiple-dry years.~~ Groundwater levels underlying the near the proposed project site appear to have minimal net change and appear to be hydrologically balanced (AECOM 2016). The Delta-Mendota Subbasin is reported to be relatively stable, with no indication of long-term decline or cone-of-depression. A groundwater contour map provided by DWR based on well data show that 2006 groundwater levels did not change markedly from 1996 levels (City of Patterson 2011).~~

~~The Sustainable Groundwater Management Act of 2014 provides for local control of groundwater sustainability with state oversight. The law states that groundwater resources should be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses. To achieve its goals, the Act requires local agencies to develop and implement groundwater sustainability plans in critically overdrafted basins by 2020 and high- and medium-priority groundwater basins by 2022. While the Act identifies specific requirements for groundwater monitoring and use, it does not affect water rights, and it only grants state agencies the power to prohibit groundwater withdrawals after the agencies determine that local efforts are not sustaining groundwater resources. Stanislaus County is currently preparing a groundwater sustainability plan to meet the requirements of the Sustainable Groundwater Management Act.~~

The Specific Plan includes goals, policies, and design guidelines, including goals to incorporate water-sensitive site design principles in the landscape, infrastructure, and building design, including on-site stormwater management. The Specific Plan calls for water conserving plants, including California natives and drought tolerant plant materials to ensure compliance with State and County water-efficient landscape standards, and minimizing lawns and turf grass. Other than the Specific Plan water-efficient designs, which demonstrate consistency with California and Stanislaus County water-efficient standards, compliance with California Green Building Code standards that reduce indoor potable water demand by 20 percent and landscape water usage by 50 percent, the pursuit of a strategy to supplement groundwater supply with surface water, and the County's preparation and implementation of a groundwater sustainability plan, there is no additional feasible mitigation <u>which can be identified at this time</u> that would allow the County to achieve the basic project objectives and further reduce water demand. The impact is **significant and unavoidable**.

4 REFERENCES

AECOM. 2016 (November). *Drainage Study for Crows Landing Industrial Business Park, Stanislaus County.*

AECOM. 2017 (November 30). Crows Landing Industrial Business Park Sanitary Sewer Infrastructure and Facilities Study.

ARB. *See* California Air Resources Board.

Black Water Consulting Engineers. 2017 (August 25). Technical Memorandum. Potential Impacts to Patterson Wastewater Facilities from Crows Landing Industrial Business Park.

California Air Resources Board. 2005 (April). *Air Quality and Land Use Handbook: A Community Health Perspective*. Available: http://www.arb.ca.gov/ch/handbook.pdf. Last accessed: February 5, 2015.

California Department of Finance (DOF). 2018 (May). E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2018 with 2010 Census Benchmark. Available online: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

California Energy Commission. 2009. California Energy Demand 2010-2020, Adopted Forecast. CEC-200-2009-012-CMF.

CAPCOA. *See* California Air Pollution Officers Association.

CEC. *See* California Energy Commission.

Central Valley Regional Water Quality Control Board. 2007. Notice of Adoption of City of Patterson Water Quality Control Facility Stanislaus County. Waste Discharge Requirements (WDRs) Order No. R5-2007-0147. Published November 1, 2007. Available: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/stanislaus/r5-2007-0147.pdf

City of Patterson. 2011 (June). Urban Water Management Plan 2010.

Ellis, David, et. al. 1991 (February). Raptor Responses to Low-Level Jet Aircraft and Sonic Booms. U.S. Fish and Wildlife Service and University of Cincinnati, Department of Biological Sciences.

Employment Development Department (EDD). Modesto Metropolitan Statistical Area (MSA) (Stanislaus County). Available online: http://www.labormarketinfo.edd.ca.gov/file/lfmonth/mode$pds.pdf.

Emsi. 2018. Economic Overview of Patterson, CA (zip code 95363). Prepared for Opportunity Stanislaus. Modesto, CA.

FAA. *See* Federal Aviation Administration

Federal Aviation Administration. 2015. Aviation Emissions and Air Quality Handbook Version 3, Update 1. Available: <

https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/media/Air_Quality_Handbook_Appendices.pdf>. Accessed March 4, 2016.

Jacobson James & Associates, Inc. 2015 (July 18). Initial Study and Mitigated Negative Declaration, Well Permit 2015-293, KGS Dhoot Partnership, Stanislaus County, California.

______. 2016. *Draft Groundwater Resources Impact Assessment Report. Crows Landing Industrial Business Park, Stanislaus County, California*. Prepared for the Stanislaus County Division of Public Works.

______. 2018 (June). Final Program Environmental Impact Report. Discretionary Well Permitting and Management Program. Stanislaus County, California.

JJ&A. *See* Jacobson James & Associates, Inc.

KDSA. *See* Kenneth D. Schmidt and Associates.

Kenneth D. Schmidt and Associates. 2010 (September). *Existing Groundwater Conditions in the Vicinity of the Proposed Riddle Surface Mine, Stanislaus County, California.* Available: http://www.stancounty.com/planning/pl/act-proj/riddle%20surface%20mine/11%20-%20existing%20groundwater%20conditions%20assessment.pdf. Accessed December 30, 2015.

Manci, Karen, et. al. 1988 (June). Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis. Engineering and Services Center, U.S. Air Force. Fish and Wildlife Service, U.S. Department of the Interior.

Navy: See U.S. Department of the Navy.

Oliphant, pers. comm., 2018 (March 6). Comments on the Crows Landing Industrial Business Park Specific Plan Draft Environmental Impact Report.

RMC. 2016 (June). *City of Patterson 2015 Urban Water Management Plan, Final*. June. Available: http://www.ci.patterson.ca.us/DocumentCenter/View/3222. Accessed August 18, 2016.

SAIC. *See* Science Applications International Corporation.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. Guide for Assessing and Mitigating Air Quality Impacts. Available: <https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf>. Accessed January 4, 2016.

Science Applications International Corporation. 1999. *Final Inventory and Evaluation of Cold War Era Historical Resources, Moffett Federal Airfield, Moffett Field, California NASA Crows Landing Flight Facility, Crows Landing, California*. Prepared by Alexandra C. Cole.

SJVAPCD. *See* San Joaquin Valley Air Pollution Control District.

Sonoma County. 2011. Charles M. Shulz Sonoma County Airport Master Plan Update Implementation Project Draft EIR. Available: https://sonomacountyairport.org/about-sts/master-plan/environmental-reports-2011/. Accessed October 12, 2018.

StanCOG. *See* Stanislaus Council of Governments.

Stanislaus Council of Governments. 2012 (March 27). Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Appendix J, Regional Demographic Forecast.

Stanislaus Council of Governments. 2014. 2014 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) PEIR. Available: http://www.stancog.org/pdf/rtp/final-2014-rtpscs-peir.pdf.

Stanislaus County. 2004 (May). *Storm Water Management Program for Stanislaus County*. Available: http://www.waterboards.ca.gov/water_issues/programs/stormwater/swmp/stanislaus_swmp.pdf. Accessed December 8, 2016.

———. 2014 (January). *Stanislaus County Standards and Specifications—Chapter 4: Storm Drainage*. Available: http://www.stancounty.com/publicworks/pdf/improvement-standards.pdf. Accessed December 30, 2015.

———. 2015 (June). *2015 Post Construction Standards Plan, A Guidance Document on Storm Water Post-Construction Design Measures for Developers and Plan Checkers.* Available: http://www.stancounty.com/publicworks/pdf/2015:standards-plan.pdf. Accessed December 30, 2015.

Stanislaus County Planning and Community Development Department. 2016. *Stanislaus County General Plan.* Available: http://www.stancounty.com/planning/pl/general-plan.shtm.

Stanislaus County Department of Environmental Resources (DER). 2018. Hazardous Materials. Available: http://www.stancounty.com/er/hazmat/. Accessed May 15, 2018.

Stanislaus County. 2016. Airport Land Use Compatibility Plan.

Stanislaus County Board of Supervisors (BOS). 2005. Referenced in Stanislaus County, 2006 (August), Crows Landing Air Facility and Industrial Business Park Master Development Plan Concept Review; and The Board of Supervisors of the County of Stanislaus Action Agenda Summary, 2006 (September 26).

———. 2006 (September 26). The Board of Supervisors of the County of Stanislaus Action Agenda Summary.

Stanislaus County Economic Development Action Committee. 2017. Comprehensive Economic Development Strategy.

Stanislaus Local Agency Formation Commission (LAFCO). 2013 (December 4th). Municipal Service Review No. 13-05, Sphere of Influence Modification No. 2013-05, & LAFCO Application 2013-04 – Arambel-Kdn Business Park Reorganization to the City of Patterson. Available: http://www.stanislauslafco.org/info/PDF/ArambelKDN/StaffReport12042013.pdf. Accessed June 15, 2018.

______. 2015 (January 28th). Municipal Service Review and Sphere of Influence Update for: Healthcare and Hospital Districts in Stanislaus County.

Stanislaus County Local Agency Formation Commission. 2016 (January). Municipal Service Review and Sphere Of Influence Update for the Western Hills Water District. Available: http://www.stanislauslafco.org/info/pdf/msr/districts/westernhillswd.pdf. Accessed February 1, 2016.

TJKM Transportation Consultants. 2018 (January 26th). Transportation Infrastructure Plan, Crows Landing Industrial Business Park.

U.S. Army Corps of Engineers. 1997 (November). *Design Guidance on Levees*. EM 1110-2-555.

———. 2000 (April). *Design and Construction of Levees*. EM 1110-2-1913.

———. 2005 (May). *Design Guidance for Levee Underseepage*. ETL 1110-2-569.

U.S. Bureau of Reclamation. 2014. Technical Memorandum, Subsidence Monitoring San Joaquin River Restoration Program 2011 – 2013.

______. 2016. Central Valley Subsidence, Annual Rates December 2011 – December 2015.

U.S. Census Bureau. 2014. 2009-2013 5-Year American Community Survey. Stanislaus County. Available: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_DP03&prodType=table. Accessed January 20, 2016

U.S. Census Bureau. 2016. American Community Survey 1-Year Estimate. Selected Economic Characteristics. Available: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_S2405&prodType=table. Accessed October 11, 2018.

U.S. Department of the Navy. 2012 (November). *Final Record of Decision Site 17 Administration Area* Groundwater Plume. NASA Crows Landing Flight Facility, Crows Landing, California. Department of the Navy Base Realignment and Closure Program Management Office West. San Diego, CA.

U.S. Environmental Protection Agency. 1972. Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution throughout the Contiguous United States. Available: https://nepis.epa.gov/Exe/ZyPDF.cgi/20013CDS.PDF?Dockey=20013CDS.PDF. Accessed October 11, 2018.

University of the Pacific. 2014 (March 28th). Eberhardt School of Business. An Analysis of Commuting Patterns in the North San Joaquin Valley.

US EPA See. U.S. Environmental Protection Agency

USACE. *See* U.S. Army Corps of Engineers.

USBR. See U.S. Bureau of Reclamation

VVH Consulting Engineers and AECOM 2016. Crows Landing Industrial Business Park Sanitary Sewer Infrastructure and Facilities Study.

VVH Consulting *Engineers* and AECOM 2016b. Crows Landing Industrial Business Park Sanitary Sewer Infrastructure and Facilities Study.

Wallace Kuhl & Associates, Inc. 2007 (November). *Preliminary Geotechnical Engineering Report and Geologic Investigation Hazard Report, West Park Project, Stanislaus County, California.* WKA Job No. 7617.02.

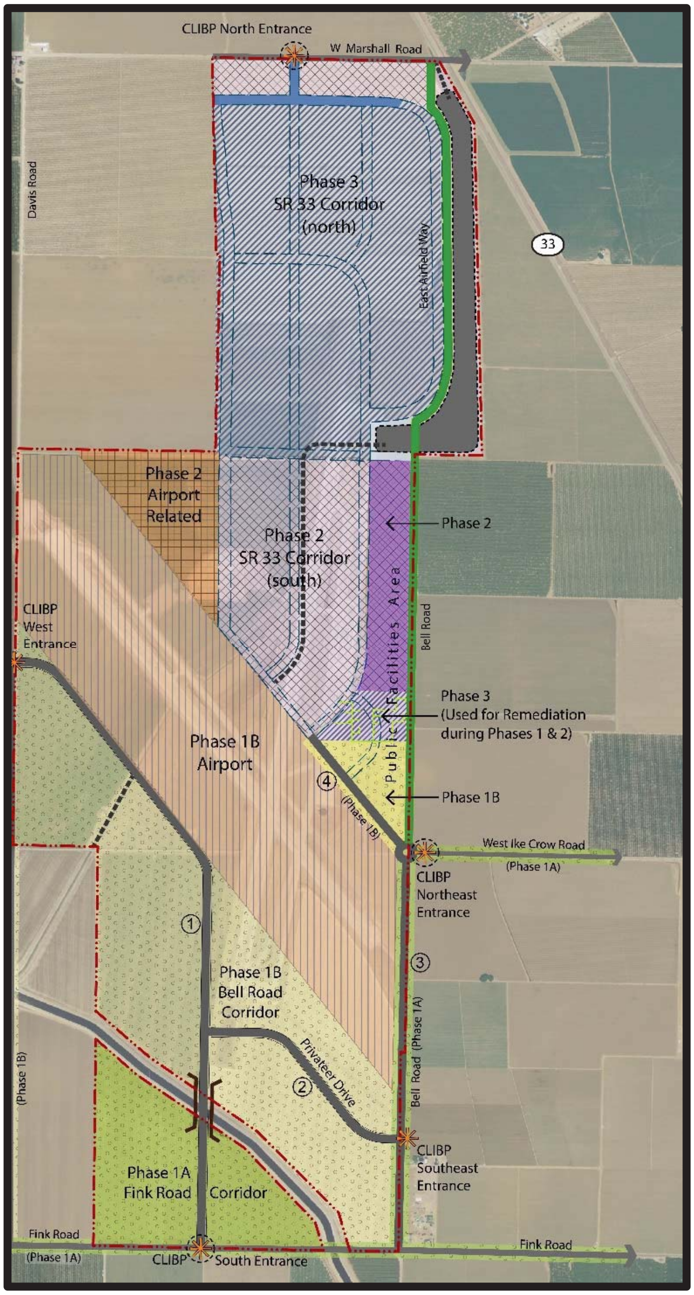
This page intentionally left blank

APPENDIX A

Transportation Infrastructure Plan

TJKM
Transportation
Consultants

Vision That Moves Your Community



Transportation Infrastructure Plan

Crows Landing Industrial Business Park

August 24, 2018

Pleasanton

Fresno

Sacramento

Santa Rosa

TJKM
Transportation
Consultants

Vision That Moves Your Community

Transportation Infrastructure Plan
For Crows Landing Industrial Business Park

August 24, 2018

Prepared by:
TJKM Transportation Consultants
4305 Hacienda Drive
Suite 550
Pleasanton, CA 94588-2798
Tel: 925.463.0611
Fax: 925.463.3690

J:\JURISDICTION\S\Stanislaus County\101-035 Crows Landing 2014\Report\R082418.docx

Table of Contents

List of Figures

List of Tables

Introduction

This report provides an analysis of transportation infrastructure needs related to the development of the proposed Crows Landing Industrial Business Park (CLIBP). This development is located south of the City of Patterson and is generally bounded by Marshall Road on the north, State Route (SR) 33 and Bell Road on the east, Fink Road on the south and Davis Road on the west. Figure 1 shows the regional location of CLIBP while Figure 2 provides a local context.

The Project

CLIBP is proposed to be a regional employment center occupying the land previously used as the Crows Landing Naval Air Station. It contains two runways, one of which will be retained for the industrial park. The site has 1,274 developable acres that are currently planned to contain over 14 million square feet of governmental, logistical/ distribution, aviation, industrial and business park uses. CLIBP is intended to be developed in phases over a number of years.

Purpose of this Report

The purpose of this report is to determine the preliminary transportation infrastructure improvements that are required to accommodate the proposed development. The infrastructure needs include the following categories:

On-site backbone street requirements

Off-site two lane streets requiring reconstruction, but not widening

Off-site two lane streets requiring widening to four lanes

Off-site traffic signals needed

Fink Road interchange improvements needed

Identification of transportation infrastructure needs is important in order to determine the order of magnitude of costs associated with the development of the site by the County of Stanislaus.

TJKM conducted the required study for this report by measuring existing traffic, determining the vehicular trip generation associated with the site, and combining the site traffic with both existing conditions and with 2035 conditions, based on the use of the Stanislaus Council of Governments (StanCOG) Tri-County Traffic Forecasting Model. The project itself is intended to be developed over three 10-year increments, so the 2035 conditions that assume full project buildout, represent a conservative analysis.

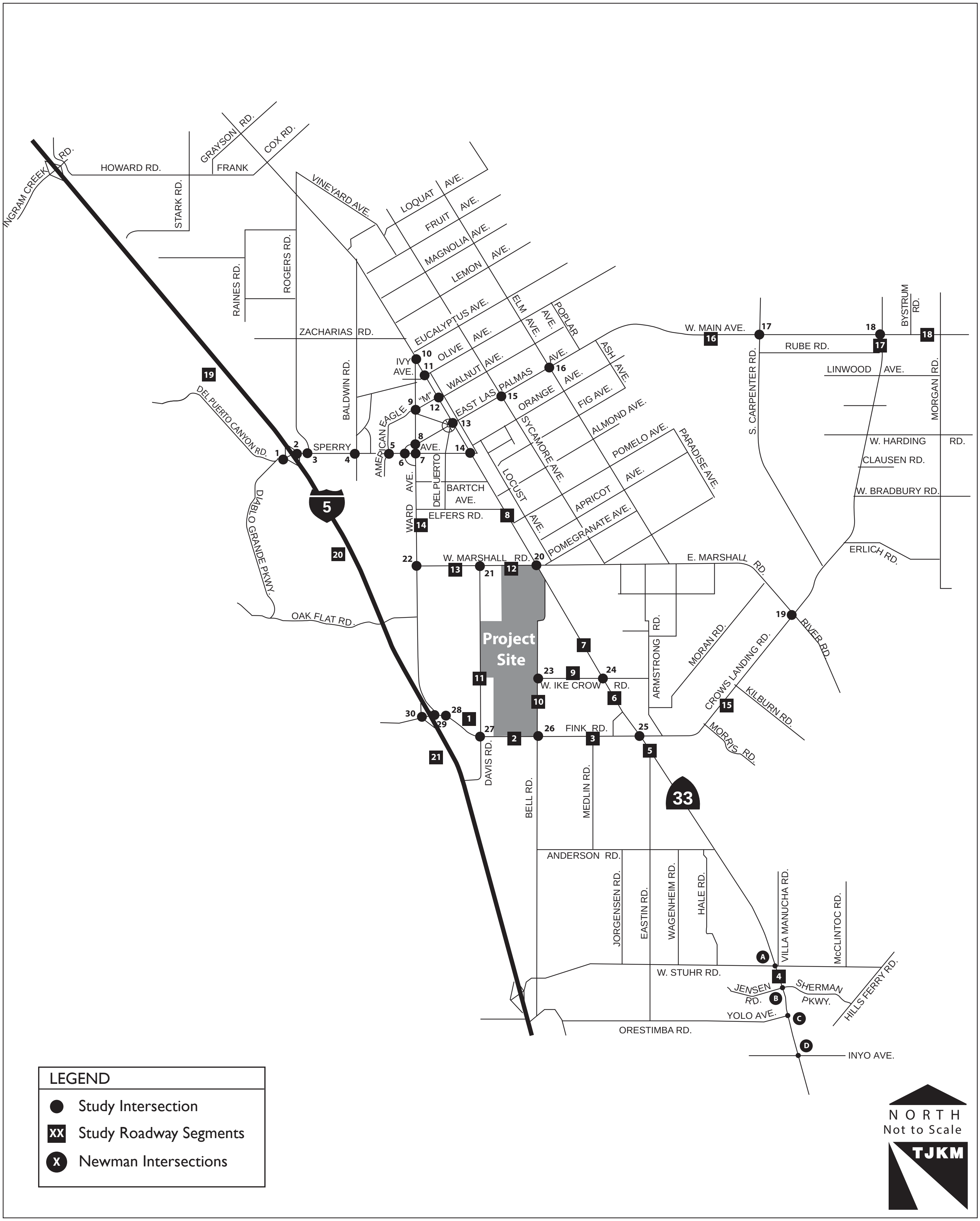
Future Analyses

Stanislaus County will be preparing an Environmental Impact Report (EIR) to provide a comprehensive analysis of the proposed CLIBP. As a part of the EIR, a transportation analysis will be prepared. The report contained in this document and the future EIR transportation analysis are companion studies; the EIR analysis will be based on the same basic data considered in this report.

Vicinity Map – Regional Area

Vicinity Map – Local Area

Figure 2



Executive Summary

This Transportation Infrastructure Master Plan for CLIBP describes the results of a traffic analysis conducted by TJKM Transportation Consultants. CLIBP is a proposed 1,528 acre, mixed-use industrial development located at the former site of the Crows Landing Naval Air Station just south of the City of Patterson.

Impact Analysis This report examines traffic impacts under existing conditions, existing plus full project conditions, 2035 conditions and 2035 plus full project conditions. TJKM examined existing conditions at 30 study intersections and 21 roadway segments to determine the transportation improvements that would be required as a result of the proposed CLIBP development. For this analysis, traffic conditions were compared with daily traffic roadway capacity values established for the agencies that have jurisdiction over roadways in the project vicinity – Stanislaus County, the City of Patterson and Caltrans. Stanislaus County's level of service (LOS) standard is LOS C for intersections and LOS D for road segments while the City of Patterson utilizes LOS D as its standard. Caltrans utilizes a LOS standard at the C/D transition.

Existing Conditions This study examines the existing roadway network near CLIBP. Nearly all roadways in the area are two-lane roadways serving agricultural activities and the incorporated areas. TJKM found that all 30 study intersections currently operate at acceptable conditions; of the 19 study intersections that are not signalized none currently meet signal warrants. The 18 roadway segments evaluated all currently have two lanes and none of the sections requires four lanes. The three freeway segments on I-5 are four lanes each, and additional lanes are not needed.

Project Traffic TJKM determined that the proposed project will likely contain over 14 million square feet of development and employ up to 14,447 persons at full buildout. The daily trip generation for the project will be 52,422 trips while the a.m. and p.m. peak hour generation will be 5,653 trips and 6,344 trips, respectively. Because of the large size and likely area of impact of the project, TJKM utilized the Tri-County model to evaluate traffic conditions. The traffic models for StanCOG, the San Joaquin Councils of Government (SJCOG) and the Merced County Association of Governments (MCAG) were recently combined to create this model. The model was utilized to evaluate Existing Plus project, 2035 no project, and 2035 Plus Project conditions.

It is TJKM's judgment that the existing plus project scenario is the most appropriate tool to evaluate the transportation improvements triggered by the CLIBP project. Although the project is likely to be built over many years and other, non-project, development and its traffic will come on line during this same time period, TJKM utilized near-term conditions to determine project responsibilities. A comprehensive EIR is being prepared for this project, and this traffic study forms the basis for the EIR transportation analysis. Fair-share responsibilities of all improvements will be presented as part of the EIR analysis. This study thereby focuses on the "up-front" requirements of the project and those additional needs during the life of the project. The following needed improvements have been identified:

On-site backbone street requirements – Nearly all on-site streets, including the backbone streets required during the first phase of the development, are recommended for a three- lane cross section.

Off-site two-lane roadways not requiring widening but needing to be rebuilt or resurfaced – Roadways in this category are portions of Bell Road, Davis Road, Ike Crow Road, Fink Road and Marshall Road.

Off-site roadways requiring four lanes – Portions of Marshall Road adjacent to the project, SR 33 from Patterson to Marshall Road, and a section of Crows Landing Road crossing the San Joaquin River will eventually need to be widened to four lanes. The four-lane river crossing on Crows Landing Road is not likely to be needed for many years – the County is currently considering rebuilding the existing two-lane bridge to bring it to current design and structural standards. The four-lane bridge is likely to be required near the end of the 30-year project development phase.

Off-site signals needed – TJKM has identified 11 intersections in the vicinity of the project that will eventually need to be signalized.

Fink Road interchange improvements needed – Although the Fink Road/I-5 interchange is basically a low-capacity rural interchange, it will not be an attractive route for employee travel to CLIBP. Employee traffic will make up the majority of trips generated by the project. Fink Road will, however, be an important link for truck and other business-travel to and from the project. Some widening under the freeway, off-ramp widening, and ramp traffic signals will need to be phased improvements for the interchange.

2035 Analysis TJKM determined additional intersection and roadway improvements that will be required by a combination of regional growth and the development of CLIBP. Additional traffic signals will be required, and more roadway sections will eventually need to be widened to four lanes. An analysis of impacts within the City of Newman reflects recent General Plan and other studies conducted in the City. It is recommended that a traffic impact fee be calculated to determine the fair share of required improvements so that the County can be reimbursed for other projects that have been "fronted" by CLIBP.

The Sperry Road interchange already requires improvement, and it is assumed that others will provide for its improvement. The City of Patterson, Stanislaus County, StanCOG and others have assigned this interchange improvement as a high priority for construction, possibly on a phased basis.

Project linkages to Stanislaus Regional Transit and other transit providers are recommended to serve the project. Also, as a part of the environmental review of the project, when specific transportation demand management (TDM) measures are identified, it will be possible to reduce the actual expected vehicular trips on certain roadway segments to reflect the programs and measures. Ridesharing and employee transit usage offer the greatest potential for trip reduction.

Analysis Methodology

Study Intersections
The County of Stanislaus staff has identified a list of 30 study intersections that will be included in the level of service (LOS) analysis. These intersections are under the jurisdiction of the City of Patterson, the County of Stanislaus or Caltrans. The list of intersections and applicable jurisdictions are as shown below and included in Figure 2:

1. I-5 SB Ramps / Sperry Avenue (Caltrans)
2. I-5 NB Ramps / Sperry Avenue (Caltrans)
3. Rogers Road / Sperry Avenue (City of Patterson)
4. Baldwin Road / Sperry Avenue (City of Patterson)
5. American Eagle Way / Sperry Avenue (City of Patterson)
6. Las Palmas Avenue / Sperry Avenue (City of Patterson)
7. Ward Avenue / Sperry Avenue (City of Patterson)
8. Ward Avenue / Las Palmas Avenue (City of Patterson)
9. Ward Avenue / M Street (City of Patterson)
10. Ward Avenue / SR 33 (Caltrans)
11. Olive Avenue / SR 33 (Caltrans)
12. Walnut Avenue / SR 33 (Caltrans)
13. Las Palmas Avenue / SR 33 (Caltrans)
14. Sperry Avenue / SR 33 (Caltrans)
15. Sycamore Avenue / Las Palmas Avenue (Stanislaus County)
16. Elm Avenue / Las Palmas Avenue (Stanislaus County)
17. Carpenter Road / W. Main Street (Stanislaus County)
18. Crows Landing Road / W. Main Street (Stanislaus County)
19. Crows Landing Road / Marshall Road (Stanislaus County)
20. Marshall Road / SR 33 (Caltrans)
21. Marshall Road / Davis Road (Stanislaus County)
22. Marshall Road / Ward Ave (Stanislaus County)
23. Ike Crow Road / Bell Road (Stanislaus County)
24. Ike Crow Road / SR 33 (Caltrans)
25. Fink Road / SR 33 (Caltrans)
26. Fink Road / Bell Road (Stanislaus County)
27. Fink Road / Davis Road (Stanislaus County)
28. Fink Road / Ward Avenue (Stanislaus County)
29. I-5 NB Ramps / Fink Road (Caltrans)
30. I-5 SB Ramps / Fink Road (Caltrans)

TJKM also evaluated four intersections in and near the City of Newman

A. Stuhr Road / SR 33
B. Jensen Road / SR 33
C. Yolo Avenue / SR 33
D. Inyo Avenue / SR 33

The intersection LOS analysis results for all the intersections are included in this report, while the mitigation measures also will be a part of the EIR transportation analysis as provided in this report. Peak hour signal warrant analyses were conducted for all the unsignalized study intersections and the results are included in this report.

In addition, the Fink Road interchange intersections with I-5 also were analyzed in this report.

Study Roadway Segments

Potential impacts from the proposed development for local roadway segments and freeway segments in the project vicinity are also evaluated. The selected study roadway segments are shown below and also included in Figure 2.

Roadway Segments

1. Fink Road between Ward Avenue and Davis Road (Stanislaus County)
2. Fink Road between Davis Road and Bell Road (Stanislaus County)
3. Fink Road between Bell Road and SR-33 (Stanislaus County)
4. SR-33 south of Stuhr Road north of Newman (Caltrans)
5. SR-33 between Stuhr Road and Fink Road (Caltrans)
6. SR-33 between Fink Road and Ike Crow Road (Caltrans)
7. SR-33 between Ike Crow Road and Marshall Road (Caltrans)
8. SR-33 between Marshall Road and Sperry Avenue (Caltrans)
9. Ike Crow Road between SR-33 and Bell Road (Stanislaus County)
10. Bell Road between Fink Road and Ike Crow Road (Stanislaus County)
11. Davis Road south of Marshall Road (Stanislaus County)
12. Marshall Road between SR-33 and Davis Road (Stanislaus County)
13. Marshall Road between Davis Road and Ward Avenue (Stanislaus County)
14. Ward Avenue between Marshall Road and Patterson (Stanislaus County)
15. Crows Landing Road between SR 33 and Marshall Road (Stanislaus County)
16. W. Main Street / Las Palmas Avenue west of Carpenter Road (Stanislaus County)
17. Crows Landing Road between Carpenter Road and W. Main Street (Stanislaus County)
18. W. Main Street east of Crows Landing Road (Stanislaus County)

Freeway Segments

1. I-5 north of Sperry Avenue (Caltrans)
2. I-5 between Sperry Avenue and Fink Road (Caltrans)
3. I-5 south of Fink Road (Caltrans)

Analysis Scenarios
The following traffic analysis scenarios were addressed in this study:

1. *Existing Conditions* – This scenario evaluates existing (2014) traffic volumes and roadway conditions based on existing counts.

2. *Existing plus CLIBP Buildout Conditions* – This scenario adds traffic generated by the proposed CLIBP to the previous scenario.

3. *2035 No CLIBP Project Conditions* – A Crows Landing Project-Specific Model was developed based on the latest Tri-County Travel Demand model and City of Patterson Travel Demand Model. This scenario assumes vacant land at the Crows Landing Project area.

4. *2035 plus CLIBP Build Out Conditions* – This scenario adds traffic generated by the proposed Project to the previous scenario.

Level of Service Analysis Methodology and Thresholds
Level of service (LOS) is a qualitative description of intersection operations using an A through F letter rating system to describe travel delay and congestion. LOS A indicates free flow conditions with little or no delay, and LOS F indicates jammed conditions with excessive delays and long back-ups.

This report analyzes 16 intersections within the City of Patterson and 14 intersections in unincorporated areas. Twelve of the unincorporated intersections are in the general vicinity of the project site; the remaining two intersections are on W. Main Street. Although all 21 roadway segments are outside of Patterson, comments are made on impacts for existing two lane streets in the City. The City has already identified which two-lane streets will eventually need to be widened to four lanes, to resolve level of service issues. In the County, project and other growth traffic will determine which County roads will need widening in the future.

Intersections: Operating conditions at the study intersections were evaluated using the 2000 Highway Capacity Manual (HCM 2000) Operations methodology. Peak hour traffic operational conditions for signalized intersections are reported as average control delay for the overall intersection in seconds per vehicle with corresponding LOS. Table 1 shows the control delay ranges for each level of service category. These are also the LOS ranges utilized by the City of Patterson.

The County of Stanislaus threshold of significance for intersections is LOS C, indicating LOS D or worse conditions are unacceptable. The City of Patterson utilizes LOS D as its standard of significance for intersections, indicating LOS E or F conditions are unacceptable. In this report intersections within the City of Patterson are evaluated with the LOS D standard; all other intersections are evaluated with the LOS C standard.

Roadway segments: For county roadway segments and conventional state highways, TJKM utilized the LOS thresholds contained in Table 3-12, "Roadway Segment Level of Service Criteria," contained in the County's *Standards and Specifications, 2014 Edition."* For Patterson city streets, TJKM used LOS tables developed by the Florida Department of Transportation for signalized roadways. For freeway segments, TJKM used Florida standards as well. The Florida LOS tables are recognized as a standard reference source for using daily traffic volumes as an indicator of roadway adequacy. The standards for various roadway sections are shown in Table II.

The minimum acceptable level of service standard for Stanislaus County and Patterson roadway segments is LOS D. Therefore, this report uses LOS D as the minimum acceptable standard to determine the number of lanes required along City, County and State roadways within the study area.

Table I: Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: Highway Capacity Manual 2000

Table II: Generalized Annual Average Daily Volumes LOS Thresholds

Facility Type	No. of Lanes	Median	Level of Service (LOS)			
			B	C	D	E
City Streets	2	Undivided	-	14,400	16,040	-
	4	Divided	-	30,600	32,000	-
	6	Divided	-	46,900	48,150	-
County and State Roads	2	Undivided	-	11,800	20,000	-
	4	Divided	-	28,440	40,000	-
	6	Divided	-	56,700	67,500	-
Freeways	4		44,100	57,600	68,900	71,700
	6		65,100	85,600	102,200	111,000
	8		85,100	113,700	135,200	150,000

Source: 2012 Florida DOT Quality/Level of Service Handbook, Table 2, Florida DOT
Stanislaus County Department of Public Works, 2014 Standards and Specifications

Caltrans Facilities

Facilities under the jurisdiction of Caltrans include freeway segments, ramps, ramp terminals, and state routes. Caltrans standards strive to maintain acceptable traffic operations on state facilities between LOS C and LOS D. This report uses LOS D as the minimum acceptable standard to determine the number of lanes required along freeway segments and state highway segments.

Therefore, a Caltrans four-lane freeway has six lanes triggered at 68,900 vehicles per day, a two-lane City street has four lanes triggered at 16,040 vehicles per day, and Stanislaus County roadways and State Highways have four lanes triggered at 20,000 vehicles per day.

Existing Conditions

Roadway Network

The project site is located south of the City of Patterson in Stanislaus County, as shown in Figures 1 and 2. Important roadways serving the project site are discussed below.

Interstate 5 (I-5) is a major north-south freeway that runs through the western portion of Stanislaus County. It is generally a four-lane freeway with two travel lanes in each direction through the Central Valley of California. The average daily traffic volume on I-5 through Stanislaus Counties is about 40,000 vehicles per day (vpd). I-5 has existing interchanges with Fink Road in the vicinity of the project and with Sperry Avenue in the City of Patterson.

The interchange of I-5/Sperry Avenue is a tight diamond interchange with a narrow, local road underpass and a steep drop in grade next to the northbound on-ramp. The ramps are one lane in all directions; the off-ramps are currently controlled by stop signs. The City of Patterson and Stanislaus County have embarked upon a comprehensive study of the interchange, which could result in improvements such as signalizing the ramp intersections at Sperry Avenue and the widening of intersection approaches.

The interchange of I-5/Fink Road is a diamond interchange with a narrow local road undercrossing. The Fink Road undercrossing is constrained by columns that support the I-5 Bridge; the off-ramps are currently controlled by stop signs.

State Route 33 (SR 33) is a north-south arterial roadway that runs parallel to the Union Pacific Rail Road (UPRR) with an at-grade rail crossing north of the intersection with Ward Avenue. SR 33 is located on the eastern edge of the Project area, approximately three miles to the east of I-5 and provides access to Westley and beyond to the north and the City of Newman and beyond to the south. SR 33 carries approximately 3,550 vpd in the project area and 7,500 vpd in the City of Patterson.

Sperry Avenue is a two-lane, east-west arterial roadway that serves as the major route running through the City of Patterson between I-5 to the west and SR 33 to the east, a three-mile distance. The segment of Sperry Road between Baldwin Road and Ward Avenue consists of four lanes. Sperry Avenue carries approximately 12,200 vpd near the I-5 freeway.

Las Palmas Avenue is a three-lane, east-west arterial roadway that includes a center two-way left-turn lane. West of SR 33, four streets form a roundabout at Las Palmas Avenue. Traffic destined for Modesto currently uses either Las Palmas Avenue or SR 33. Las Palmas Avenue carries approximately 13,000 vpd. Outside of the Patterson city limits, Las Palmas Avenue is a two-way roadway and becomes W. Main Street east of the San Joaquin River.

Sycamore Avenue is a two-lane, north-south collector roadway in the City of Patterson. Sycamore Avenue links Loquat Avenue to the north and East Marshall Road to the south, a distance of seven miles.

Del Puerto Canyon Road a two-lane, east-west local roadway in Stanislaus County that connects Santa Clara County in the west with the I-5 southbound ramps, where it continues easterly as Sperry Avenue.

Rogers Road is a north-south collector roadway that provides access between SR 33 in the north and Sperry Avenue in the south. From Sperry Avenue to approximately 0.35 miles north, Rogers Road is a five-lane roadway that includes a two-way left-turn lane. Further north, Rogers Road reduces to two lanes.

Baldwin Road is a two-lane, north-south collector roadway that provides access from Vineyard Avenue in the north to just south of Azalea Drive in the south, where it terminates.

American Eagle Avenue is a two-lane, north-south collector roadway that runs between Sweet Briar Drive in the south to Ward Avenue in the north, where it continues northeasterly as M Street.

Ward Avenue is a two-lane, north-south collector roadway that runs between Fink Road outside of the Patterson city limits in the south and SR 33 in the north.

M Street is a two-lane, east-west local roadway that links Ward Avenue in the west and SR 33 in the east, where it continues easterly as Walnut Avenue.

Olive and Walnut Avenues are two-lane, east-west roadways that link SR 33 in the west with Poplar Avenue in the east. Olive Avenue continues as Ivy Avenue west of SR 33, and terminates just past Poplar Avenue in the east. Walnut Avenue continues as M Street west of SR 33 and terminates at Poplar Avenue in the east.

Elm Avenue is a two-lane, north-south local roadway that runs between Marshall Avenue in the south to just north of Loquat Avenue, where it terminates.

Carpenter Road is a two-lane, north-south collector roadway that links the City of Modesto in the north with Crows Landing Road in the south.

Fink Road is a two-lane east-west arterial roadway that links I-5 in the west with the unincorporated community of Crows Landing in the east. East of SR 33, Fink Road becomes Crows Landing Road, which continues northerly to the City of Modesto.

Marshall Road is a two-lane east-west collector roadway that runs along the project site's northern boundary, and links Ward Avenue in the west with Crows Landing Road in the east within unincorporated Stanislaus County. East of Crows Landing Road, Marshall Road becomes River Road and continues southerly to its terminus at Hills Ferry Road northeast of the City of Newman.

Davis Road is a two-lane north-south collector roadway that runs along the project site's western boundary, and provides access between Marshall Road in the north and Fink Road in the south. Davis Road continues 0.75 miles south of Fink Road before turning west to cross I-5 and terminating at an adjacent rural/residential development.

Ike Crow Road is a two-lane, east-west collector roadway that links the project site with SR 33 and Armstrong Road to the east within unincorporated Stanislaus County.

Bell Road is a two-lane, north-south collector roadway that runs along the project site's eastern boundary, and links SR 33 in the north with Orestimba Road in the south within unincorporated Stanislaus County.

Existing Peak Hour and Daily Traffic

TJKM collected existing 24-hour daily tube counts for 18 Stanislaus County study roadway segments in January 2014. These are shown on Table III. In addition, turning movement counts at 30 study intersections were collected during both a.m. peak period (7 a.m. to 9 a.m.) and p.m. peak period (4 p.m. to 6 p.m.) in January 2014. Volumes on I-5 were obtained from Caltrans documents.

Level of Service Analysis - Existing Conditions

Table III summarizes the results of the intersection level of service analysis for Existing Conditions. Currently, all existing study intersections and study roadway segments operate at acceptable levels of service based on applicable jurisdictional standards.

Table III also summarizes whether the peak hour warrant is met for all the unsignalized study intersections during both a.m. and p.m. peak hours. As shown, no unsignalized study intersections meet peak hour signal warrants under existing conditions.

Table III: Intersection Levels of Service – Existing Conditions

ID	Intersection	Type of Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant
1	I-5 SB Ramps / Sperry Ave	OWSC	11.6	B	N	22.2	C	N
2	I-5 NB Ramps / Sperry Ave	OWSC	9.8	A	N	13.4	B	N
3	Rogers Rd / Sperry Ave	Signalized	13.5	B	-	13.7	B	-
4	Baldwin Rd / Sperry Ave	Signalized	18.5	B	-	16.0	B	-
5	American Eagle Way / Sperry Ave	Signalized	16.5	B	-	13.1	B	-
6	Las Palmas Ave / Sperry Ave	Signalized	13.8	B	-	16.2	B	-
7	Ward Ave / Sperry Ave	Signalized	33.4	C	-	21.6	C	-
8	Ward Ave / Las Palmas Ave	Signalized	13.2	B	-	9.8	A	-
9	Ward Ave / M St	Signalized	42.4	D	-	26.1	C	-
10	Ward Ave / SR 33	OWSC	13.3	B	N	13.9	B	N
11	Olive Ave / SR 33	TWSC	14.2	B	N	14.6	B	N
12	Walnut Ave / SR 33	Signalized	24.4	C	-	18.7	B	-
13	Las Palmas Ave / SR 33	Signalized	16.5	B	-	15.6	B	-
14	Sperry Ave / SR 33	TWSC	23.3	C	N	37.2	E	N
15	Sycamore Ave / Las Palmas Ave	Signalized	18.0	B	-	14.5	B	-
16	Elm Ave / Las Palmas Ave	Signalized	10.5	B	-	10.6	B	-
17	Carpenter Rd / W. Main St	AWSC	11.0	B	N	12.2	B	N
18	Crows Landing Rd. / W. Main St	AWSC	14.5	B	N	16.0	C	N
19	*Crows Landing Rd / Marshall Rd	AWSC	8.9	A	N	10.1	B	N
20	Marshall Rd / SR 33	TWSC	11.4	B	N	11.3	B	N
21	Marshall Rd / Davis Rd	OWSC	8.6	A	N	8.8	A	N
22	Marshall Rd / Ward Ave	OWSC	8.7	A	N	8.8	A	N
23	Ike Crow Rd / Bell Rd	TWSC	8.8	A	N	0.0	A	N
24	Ike Crow Rd / SR 33	TWSC	10.3	B	N	10.9	B	N
25	Fink Rd / SR 33	AWSC	11.5	B	N	9.7	A	N
26	Fink Rd / Bell Rd	TWSC	10.1	B	N	9.5	A	N
27	Fink Rd / Davis Rd	TWSC	9.8	A	N	9.7	A	N
28	Fink Rd / Ward Ave	OWSC	9.4	A	N	9.2	A	N
29	I-5 NB Ramps / Fink Rd	OWSC	8.8	A	N	8.8	A	N
30	I-5 SB Ramps / Fink Rd	OWSC	9.4	A	N	9.6	A	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service
Bold values indicate unacceptable LOS conditions and signal warrant met
*Intersection19 is currently TWSC but has been approved and is analyzed as AWSC
Source: TJKM Transportation Consultants, January 2015

Table IV summarizes the results of the roadway segment/freeway segment level of service analysis for Existing Conditions. Currently, all existing study roadway segments operate at acceptable levels of service. No additional lanes are required to meet the LOS threshold.

Table IV: Roadway/Freeway Segment Levels of Service – Existing Conditions

ID	Roadway Segments	Existing Number of Lanes	Jurisdiction	LOS Threshold	Existing Conditions		
					ADT	LOS	# of Lanes Required
1	Fink Rd between Ward Ave and Davis Rd	2	County	D	1,638	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	D	1,490	C or Better	2
3	Fink Rd between Bell Rd and SR-33	2	County	D	1,661	C or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	8,197	C or Better	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	5,123	C or Better	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	3,619	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	Caltrans	C-D	3,545	C or Better	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	4,161	C or Better	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	D	27	C or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	D	50	C or Better	2
11	Davis Rd south of Marshall Rd	2	County	D	77	C or Better	2
12	Marshall Rd between SR-33 and Davis Rd	2	County	D	656	C or Better	2
13	Marshall Rd between Davis Rd and Ward Ave	2	County	D	641	C or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	D	1,246	C or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	D	2,396	C or Better	2
16	W. Main St west of Carpenter Rd	2	County	D	7,342	C or Better	2
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	D	5,237	C or Better	2
18	W. Main St east of Crows Landing Rd	2	County	D	6,392	C or Better	2
	Freeway Segments						
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	40,000	B or Better	4
20	I-5 between Fink Rd and Sperry Ave	4	Caltrans	C-D	38,000	B or Better	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	37,000	B or Better	4

Notes: LOS = Level of Service, n/o = north of, s/o = south of
Source: TJKM Transportation Consultants, January 2015

Project Description

Project Location

The proposed CLIBP Project will be located entirely on the former 1,528-acre Crows Landing Naval Air Station located north of Fink Road, east of Davis Road, west of SR 33 and Bell Road and south of Marshall Road in an unincorporated area of Stanislaus County, California. The project vicinity is shown in Figures 1 and 2.

Site Layout

The proposed CLIBP is envisioned to include approximately 14 million square feet of governmental, logistical/distribution, aviation, industrial and business park uses. The CLIBP will be developed in three phases over an approximate 30-year period.

The distribution of land uses includes 370 acres devoted to general aviation uses, 68 acres to various municipal uses, 349 acres for logistics/distribution, 350 acres for industrial uses, 78 acres for business park uses, 46 acres for aviation-related uses, and 13 acres for multi-modal uses. The remaining acreage will be associated with the necessary infrastructure. Figure 3 shows the CLIBP site plan, including phasing.

Regional Significance of Project

The CLIBP will be located within commute distance of many Central Valley communities. The project will potentially attract employees from the Stanislaus County communities of Patterson, Newman, Modesto, Ceres and Turlock but could draw employees and visitors from nearby Merced and San Joaquin counties. Most of the employee trips are drawn either from Patterson to the north or from the communities to the east such as Turlock and Modesto. The project area is currently served by state and county highway facilities. A few area roadways are expected to be widened to accommodate future project-related traffic.

Trip Generation

Table V shows trip generation estimates for the proposed CLIBP Project. Trip generation for the Project was estimated based on rates provided in *Trip Generation (*9th Edition) published by the Institute of Transportation Engineers (ITE).

In traffic studies for proposed development projects, a specific project proposal is evaluated in which building square footage is known. In such cases, it is generally considered that the traffic generating characteristics of the building square footage, using ITE rates, is more reliable than using employment data, which is more speculative. The available factors in this case are planned land use designations, floor area ratios, and employee densities. Based on this information, the number of employees for each land use category for each development phase was calculated. The corresponding ITE trip generation rates for each category were utilized to produce the total Project trip generation on a daily and peak hour basis.

The proposed Project is expected to produce up to 14,447 employees that will generate a total of approximately 52,422 daily trips, 5,653 a.m. peak hour trips and 6,344 p.m. peak hour trips.

Table V: Proposed Crows Landing Industrial Business Park Land Use and Trip Generation Estimates

Proposed Land Use						Trip Generation Estimate														
Corridor/Use (Developable Land)	Developable Acres	Floor-Area Ratio (FAR)	Building Area, (per KSF)	Employees (per KSF)	Total Employees	ITE Land Use Code	Daily		AM Peak Hour						PM Peak Hour					
							Rate / Equation	Total Trips	Rate / Equation	Total Trips	In %	Out %	In	Out	Rate / Equation	Total Trips	In %	Out %	In	Out
PHASE 1 (764 Acres)																				
PHASE 1A: Fink Rd Corridor																				
Logistics/Distribution	52	0.35	785	0.35	275	High-Cube Warehouse/Distribution Center (152) *	Equ. E	1,168	KSF-based Trip Rates AM PH/Daily Ratio	77	69%	31%	53	24	KSF-based Trip Rates PM PH/Daily Ratio	84.127	31%	69%	26	58
Industrial	41	0.35	628	0.97	609	General Light Industrial (110)	Equ. B	1,827	Equ. C	235	83%	17%	195	40	Equ. D	235	21%	79%	49	185
Business Park	10	0.35	157	2.80	440	Business Park (770)	Equ. F	2,332	Equ. G	246	85%	15%	209	37	Equ. H	238	22%	78%	52	185
Phase 1A: Fink Rd Corridor Subtotal	***103***		***1,570***		***1,324***			***5,328***		***558***			***457***	***101***		***556***			***128***	***429***
PHASE 1B: Bell Rd Corridor																				
Logistics/Distribution	138	0.35	2,104	0.35	736	High-Cube Warehouse/Distribution Center (152) *	Equ. E	2,568	KSF-based Trip Rates AM PH/Daily Ratio	169.5052	69%	31%	117	53	KSF-based Trip Rates PM PH/Daily Ratio	184.915	31%	69%	57	128
Industrial	110	0.35	1,683	0.97	1,633	General Light Industrial (110)	Equ. B	4,848	Equ. C	511	83%	17%	424	87	Equ. D	532	21%	79%	112	420
Business Park	28	0.35	421	2.80	1,178	Business Park (770)	Equ. F	4,687	Equ. G	573	85%	15%	487	86	Equ. H	527	22%	78%	116	411
Bell Rd Corridor Subtotal	*276*		*4,208*		*3,547*			*12,103*		*1,254*			*1,029*	*225*		*1,244*			*285*	*959*
Aviation - Phases 1 through 3 (Part of Phase 1 Infrastructure)	370	NA	NA	NA	1	General Aviation Airport (022)**	Equ. A	116	1.29	1	50%	50%	1	1	Equ. L	3	55%	45%	2	1
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	15	0.25	163	2.80	457	General Office Building (710)	Equ. I	1,595	Equ. J	246	88%	12%	217	30	Equ. K	229	17%	83%	39	190
Phase 1B Subtotal	**661**		**4,371**		**4,005**			**13,814**		**1,502**			**1,246**	**256**		**1,476**			**326**	**1,150**
PHASE 1 TOTAL	**764**		**5,941**		**5,329**			**19,142**		**2,060**			**1,703**	**356**		**2,032**			**453**	**1,579**
PHASE 2 (236 Acres)																				
SR 33 Corridor (South)																				
Logistics/Distribution	57	0.40	990	0.69	683	High-Cube Warehouse/Distribution Center (152) *	Equ. E	2,419	KSF-based Trip Rates AM PH/Daily Ratio	160	69%	31%	110	49	KSF-based Trip Rates PM PH/Daily Ratio	174	31%	69%	54	120
Industrial	71	0.40	1,237	0.97	1,200	General Light Industrial (110)	Equ. B	3,571	Equ. C	394	83%	17%	327	67	Equ. D	406	21%	79%	85	321
Business Park	14	0.40	247	2.80	693	Business Park (770)	Equ. F	3,140	Equ. G	363	85%	15%	309	54	Equ. H	343	22%	78%	75	268
SR 33 Corridor (South) Subtotal	*142*		*2,474*		*2,576*			***9,129***		***917***			***746***	***171***		***1,721***			***215***	***709***
Aviation-Related Use	**46**	0.40	**802**	0.35	**281**	General Aviation Airport (022)**	Equ. A	**3,837**	1.29	**362**	50%	50%	**181**	**181**	Equ. L	355	55%	45%	**195**	**160**

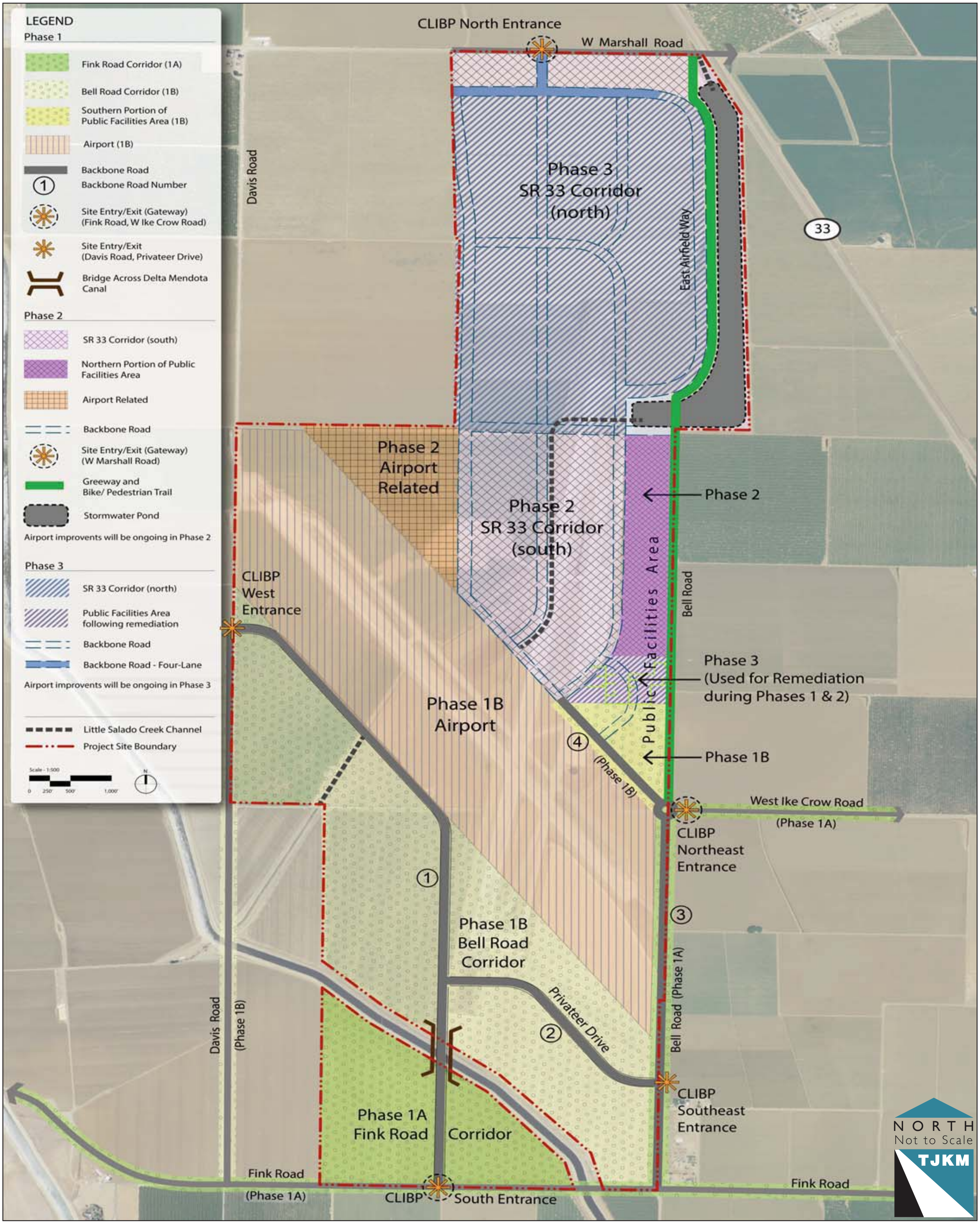
Proposed Land Use						Trip Generation Estimate														
Multimodal Transportation (Bike/Ped Trail + Monument)	**13**	NA	**NA**	NA	**2**															
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	**35**	0.25	**381**	2.80	**1,067**	General Office Building (710)	Equ. I	**3,252**	Equ. J	**511**	88%	12%	**450**	**61**	Equ. K	455	17%	83%	**77**	**378**
PHASE 2 TOTAL	**236**		**3,657**		**3,926**			**16,219**		**1,791**			**1,377**	**414**		**2,531**			**487**	**1,246**
PHASE 3 (274 Acres)																				
SR 33 Corridor (North)																				
Logistics/Distribution	102	0.40	1,784	0.69	1,231	High-Cube Warehouse/Distribution Center (152) *	Equ. E	3,876	KSF-based Trip Rates AM PH/Daily Ratio	256	69%	31%	176	79	KSF-based Trip Rates PM PH/Daily Ratio	279	31%	69%	87	193
Industrial	128	0.40	2,230	0.97	2,163	General Light Industrial (110)	Equ. B	6,411	Equ. C	654	83%	17%	543	111	Equ. D	685	21%	79%	144	541
Business Park	26	0.40	446	2.80	1,249	Business Park (770)	Equ. F	4,913	Equ. G	603	85%	15%	513	90	Equ. H	553	22%	78%	122	431
SR 33 Corridor (North) Subtotal	**256**		***4,460***		***4,643***			***15,200***		***1,513***			***1,232***	***281***		***1,517***			**352**	***1,165***
Public Facilities - Law Enforcement, Fire, Municipal Offices, etc.	**18**	0.25	**196**	2.80	**549**	General Office Building (710)	Equ. I	**1861**	Equ. J	**289**	1	0	**254**	**35**	Equ. K	**263**	0	1	**45**	**218**
PHASE 3 TOTAL	**274**		**4,656**		**5,192**			**17,061**		**1,802**			**1,486**	**316**		**1,781**			**397**	**1,384**
GRAND TOTAL	**1,274**		**14,254**		**14,447**			**52,422**		**5,653**			**4,567**	**1,086**		**6,344**			**1,337**	**4,209**

Notes: * Employee-Based Rates missing : Daily rates base on Industrial Park (130), AM/PM Peak Hour based on KSF-based rates Peak to Daily Ratio
** Peak Hour Trip Rates for Aviation are for peak hour of the generator
Equ. = Equation from ITE Trip Generation. T=Total Trips, X=Total Employees
Equ. A: T=13.29*X+102.99; Equ. B: T=2.95*X+30.57; Equ. C: T=0.27*X+70.47; Equ. D: T=0.29*X+58.03; Equ. E: Ln (T) =0.8*Ln(X)+2.57; Equ. G: Ln (T)=0.86*Ln(X)+0.27; Equ. H: Ln (T) =0.81 Ln(X) +0.54; Equ. I: Ln (T) =0.84 Ln(X) +2.23; Equ. J: Ln (T) =0.86 Ln(X) +0.24
Equ. K: T=0.37(X) +60.08; Equ. L: Ln (T) = 0.85 Ln(X) + 1.08
AM Peak to Daily Ratio = 0.066, PM Peak to Daily Ratio = 0.072

Source: Mead & Hunt, Inc., July 2014 (Land Use); TJKM Transportation Consultants, July 2014 (Trip Generation); ITE *Trip Generation 9th Edition*, 2012

Site Plan

Figure 3



Source: AECOM

Travel Demand Model

Description of Daily Study Model

A long-range traffic-forecasting model was used to assess the impact of the proposed Crows Landing Industrial Business Park. The StanCOG (Stanislaus County Council of Governments) countywide gravity based model was used in the study.

TJKM used the most current StanCOG model for the study. The StanCOG model is used for the Stanislaus County Regional Transportation Plan (RTP) and other purposes. The current model, known as the Three-County Model, combines the StanCOG model with those used in San Joaquin County (SJCOG model) and Merced County (MCAG model). The combined model provides very good coverage of the study area, extending from Tracy-Stockton to the north of and Los Banos to the south of the Project area.

All of the modeling done recently in Stanislaus County has been based on the then-most recent version of the StanCOG model. This includes the Patterson General Plan, the current CLIBP study, the South County Corridor Study, the Sperry Road interchange analysis, and the current Crows Landing Road study.

A detailed model calibration was made based on the counts collected at the study intersections and study roadway segments. Detailed Traffic Analysis Zones (TAZs) are used to represent geographical locations in the model. Trips are generated at the TAZ level and distributed onto the roadway network. TJKM developed three new traffic analysis zones (TAZs) for the project area and loaded the ITE trip generation volumes into the model for distribution and assignment.

Model calibration is a process to adjust the model estimates to the existing traffic condition as reflected in the traffic counts. Demand forecasting models need to be demonstrably reliable and credible after the model calibration before being used for analysis on a project. It is important that the analysis tools not become a point of contention, so that the real issues can be properly understood and addressed both within the design team and public meetings. The calibration effort of the Patterson model was pursued with this goal in mind. Since the R^2 (which is a measure of the accuracy of the traffic estimates) is nearly 0.9 after model calibration (verses 0.5 or less before calibration), it can be concluded that TJKM has calibrated the model to a very high level of accuracy.

After the model was calibrated, the difference method [1](Wu & Thnay, ITE 2001) was used to obtain future link level and intersection turning movement volumes based on the calibrated OD matrices. These volumes were used to calculate the level of service for the study intersections in this project.

In this study, TJKM used the model to determine a.m. and p.m. peak hours and daily trips. TJKM used the model to develop forecasts for Existing Plus Project, 2035 No Project and 2035 Plus project conditions.

Appendix A contains plots showing project traffic assignment to the street network during a.m. and p.m. peak hours.

---

[1] *Wu, J.H. and C. Thnay (2001), "An OD Based Method for Estimating Link and Turning Volume Based on Counts", Proceedings of Institute of Transportation Engineers (ITE) District 6 Annual Conference, July 9-12, 2001.*

South County Corridor
The South County Corridor (SCC) Feasibility Study was a recently completed cooperative planning effort between the Stanislaus Council of Governments (StanCOG), Stanislaus County, and the Cities of Patterson, Turlock and Newman, to assess the feasibility of a new east-west four lane divided expressway that would provide a direct travel route between State Route 99 and Interstate 5 (I-5) in the southern part of Stanislaus County. The study was completed in 2016.

Although there appears to be a consensus that such a roadway should be constructed, there is not yet a single preferred alternative for the SCC. Several alternatives are still being considered. A Project Study Report is the next planned step in the SCC, which will provide more detailed environmental and traffic analyses. This may result in the selection of a preferred alternative.

The City of Patterson General Plan includes a proposed new interchange on I-5 at the Zacharias Road alignment north of the City. This is one version of the western terminus of the SCC. From Zacharias Road, the SCC could follow the W. Main Street corridor to the City of Turlock. Because of its status it was not possible to include the SCC in the CLIBP analysis.

However, the SCC is likely to ultimately provide some traffic relief to Patterson streets, particularly Sperry Road and Las Palmas Avenue. In the description of future traffic impacts in Patterson, with and without the CLIBP, a discussion of potential SCC benefits is included in a qualitative fashion.

Existing plus Project Conditions
This section analyzes 2014 traffic conditions in the study area with the proposed CLIBP project. TJKM utilized the existing transportation network upon which to assign project trips. Traffic volumes from 2014 were the latest available during the preparation of this report. However, 2015 Caltrans volumes are now available; on I-5 and SR 33 in Patterson, 2015 volumes are unchanged from 2014 volumes. The report volumes are still representative of baseline conditions.

Table VI summarizes the results of the intersection level of service analysis under Existing plus Project conditions. The table shows the delay at each intersection, whether traffic signal warrants are satisfied, and the change in delay resulting from the addition of project traffic.

Table VII summarizes the results of the segment level of service analysis under Existing plus Project conditions. The table shows both existing number of lanes and the expected number of lanes required for acceptable roadway operations under existing conditions with and without the project.

Fink Road / I-5 Interchange

Table VI: Intersection Levels of Service - Existing plus Project Conditions

ID	Intersection Name	Type of Control	A.M. Peak Hour			P.M. Peak Hour			*Delay Diff from Existing Conditions*	
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant	*A.M. Peak Hour*	*P.M. Peak Hour*
1	I-5 SB Ramps / Sperry	OWSC	67.3	**F**	N	28.6	D	N	*55.7*	*6.4*
2	I-5 NB Ramps / Sperry	OWSC	11.9	B	N	16.2	C	N	*2.1*	*2.8*
3	Rogers Rd / Sperry	Signalized	11.6	B	-	11.9	B	-	*1.1*	*0.4*
4	Baldwin Rd / Sperry	Signalized	22.9	C	-	19.6	B	-	*4.4*	*3.6*
5	American Eagle Way / Sperry Ave	Signalized	18.1	B	-	13.8	B	-	*1.6*	*0.7*
6	Las Palmas / Sperry	Signalized	22.1	C	-	18.3	B	-	*8.3*	*2.1*
7	Ward Ave / Sperry	Signalized	>150	**F**	-	99.4	**F**	-	-	*76.9*
8	Ward / Las Palmas	Signalized	64.4	**E**	-	34.9	C	-	*31.0*	*13.8*
9	Ward Ave / M St	Signalized	47.5	D	-	8.3	a	-	*5.1*	-
10	Ward Ave / SR 33	OWSC	18.4	C	N	16.7	C	N	*5.1*	*2.8*
11	Olive Ave / SR 33	TWSC	18.8	C	N	16.5	C	N	*4.6*	*1.9*
12	Walnut Ave / SR 33	Signalized	34.6	C	-	22.6	C	-	*10.2*	*3.9*
13	Las Palmas / SR 33	Signalized	36.8	D	-	22.8	C	-	*20.3*	*7.2*
14	Sperry Ave / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
15	Sycamore / Las Palmas	Signalized	25.2	C	-	24.3	C	-	*7.2*	*9.8*
16	Elm Ave / Las Palmas	Signalized	22.4	C	-	19.7	B	-	*11.9*	*9.1*
17	Carpenter/ W. Main	AWSC	>150	**F**	**Y**	105	**F**	**Y**	-	*92.8*
18	Crows Landing Rd / W. Main St	AWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
19	Crows Landing Rd / Marshall Rd	AWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
20	Marshall Rd / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
21	Marshall Rd / Davis Rd	OWSC	-	*Note: Davis discontinued with project in place*						
22	Marshall Rd / Ward	OWSC	>150	**F**	N	>150	**F**	**Y**	-	*.150*
23	Ike Crow Rd / Bell Rd	TWSC	30.3	D	N	42.3	**E**	N	*21.5*	*42.3*
24	Ike Crow Rd / SR 33	TWSC	>150	**F**	N	>150	**F**	**Y**	-	-
25	Fink Rd / SR 33	AWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
26	Fink Rd / Bell Rd	TWSC	>150	**F**	**Y**	>150	**F**	**Y**	-	-
27	Fink Rd / Davis Rd	TWSC	40.7	**E**	N	15.2	C	N	*30.9*	*5.5*
28	Fink Rd / Ward Ave	OWSC	>150	**F**	N	17.7	C	N	-	*8.5*
29	I-5 NB Ramps / Fink	OWSC	139.3	**F**	**Y**	9.5	A	N	*130.5*	*0.7*
30	I-5 SB Ramps / Fink Rd	OWSC	14.2	B	N	23.4	C	N	*4.8*	*13.8*

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Bold values indicate unacceptable LOS conditions and signal warrant met

Source: TJKM Transportation Consultants, January 2015

Table VII: Roadway Segment Level of Service - Existing plus Project Conditions

ID	Roadway Segment	Existing # of Lanes	Jurisdiction	LOS Threshold	Existing Conditions			Existing plus Project Conditions		
					ADT	LOS	# of Lanes Requir.	ADT	LOS	# of Lanes Requir.
1	Fink Rd between Ward Ave and Davis Rd	2	County	D	1,638	D or Better	2	4,459	D or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	D	1,490	D or Better	2	3,251	D or Better	2
3	Fink Rd between Bell Rd and SR-33	2	County	D	1,661	D or Better	2	10,225	D or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	8,197	C or Better	2	15,957	D	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	5,123	C or Better	2	13,954	D	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	3,619	C or Better	2	10,769	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall	2	Caltrans	C-D	3,545	C or Better	2	14,825	D	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	4,161	C or Better	2	17,705	D	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	D	27	D or Better	2	4,171	D or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	D	50	D or Better	2	6,755	D or Better	2
11	Davis Rd south of Marshall Rd	2	County	D	77	D or Better	2	-	-	-
12	Marshall Rd between SR-33 and CLIBP Entrance	2	County	D	656	D Or Better	2	29,721	**E**	4
13	Marshall Rd between Davis Rd and Ward Ave	2	County	D	641	D or Better	2	2,746	D or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	D	1,246	D or Better	2	3,959	D or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	D	2,396	D or Better	2	6,704	D or Better	2
16	W. Main St west of Carpenter Rd	2	County	D	7,342	D or Better	2	10,982	D or Better	2
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	D	5,237	D or Better	2	11,010	D or Better	2
18	W. Main St east of Crows Landing Rd	2	County	D	6,392	D or Better	2	9,444	D or Better	2
	Freeway Segment									
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	40,000	A	4	41,341	C or Better	4
20	I-5 -- Fink to Sperry	4	Caltrans	C-D	38,000	A	4	39,121	C or Better	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	37,000	A	4	37,878	C or Better	4

Notes: LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Shading indicates four lanes are triggered. State highway 4 lane trigger is 20,000 ADT, non-state highway is 16,040ADT

Source: TJKM Transportation Consultants, January 2015

Near Term Improvements Triggered by CLIBP Project

Improvement Categories

This document examines transportation improvement categories as follows:

On-site backbone street requirements
Off-site two lane streets with poor structural conditions and no additional lanes needed
Off-site two lane streets needing widening to four lanes
Off-site traffic signals needed
Fink Road interchange improvements

TJKM utilized the County of Stanislaus Public Works Department 2014 Standards and Specifications to determine various road standards.

Phasing of Improvements

In this document, TJKM recommends roadway improvements to be timed with, or triggered by, one of three project phases described earlier. TJKM has not conducted phase by phase traffic studies, only an analysis of the entire project under near term (existing plus project) or long term (2035 plus project) conditions. In reality, the three project phases are the best estimate of how the project may develop over time based on a variety of considerations. TJKM has estimated which phase each needed roadway project is associated with, but this also is the best estimate possible at this time. In reality, the timing of roadway improvements should be based on monitoring of roadway conditions during the life of the buildout of the project. Since roadway improvements need to be planned, designed and constructed over a long time period, the monitoring will need to look forward from then-existing conditions for an approximate three to five year period to allow for sufficient time to implement needed improvements.

On-site Backbone Street Requirements

Figure 4 shows the planned layout and phasing of the CLIBP along with the backbone roads. For the purposes of this analysis, all backbone roadway segments have been numbered. TJKM assumes that two-lane backbone streets will utilize a standard recommended by the Stanislaus County Public Works Department. This roadway has a 60-foot curb-to-curb width, which is ideal for two 12-foot through lanes, one 12-foot two-way-left-turn (TWLT) center lane and two additional 12-foot wide lanes for parking. This street has a total right of way width of 120 feet, which includes a 30-foot section on each side of the road for drainage and a six-foot sidewalk.

For streets with greater traffic demands, a four-lane roadway with a median to accommodate left turn lanes is recommended.

Most backbone streets for this project need to be two lanes. At the design stages, some widening near important intersections can be expected. The following cross-sections are recommended for backbone streets:

<u>Four-lane Roadway</u>
Segment 5

<u>Three-lane Roadway</u>
All other backbone streets including segments 1 – 4.

Off-site Two Lane Streets – No Widening Required

There are some streets near the CLIBP that either will not need widening beyond two lanes in the near term, or widening to four lanes, if and when needed, is in the distant future. Some roadways may need minor widening to shoulders or to increase lane widths. The streets listed below are in that category, and have poor surface (likely structural) conditions.

- W. Ike Crow Road – Bell Road to SR 33. The approximate length of this roadway is 6,525 feet. This roadway should likely be improved beginning during Phase 1A of CLIBP.
- Davis Road – Fink Road to Backbone Roadway 1. The approximate length of this roadway is 8,150 feet. This roadway is associated with Phase 1B of CLIBP and crosses the Delta Mendota Canal. The bridge crossing of the canal appears to have adequate width to accommodate the future improvements.
- Bell Road – W. Ike Crow Road to Fink Road. For the purposes of this analysis, this portion of Bell Road is considered segment 3 of the Backbone road system, which is in poor condition. It should likely be improved during Phase 1A of CLIBP.
- Marshall Road – Ward Avenue to CLIBP entrance. The approximate length of this roadway is 9,600 feet. (The section from CLIPBP entrance to SR 33 requires four lanes as noted in the next improvement category.) This roadway is characterized by having a series of substantial power poles on the north side of the roadway, which can presumably be considered immovable objects. The poles switch to the south side west of the substation located alongside the east edge of the Delta Mendota Canal. The roadway crossing of the Delta Mendota Canal has a bridge width on Marshall is about 20 to 22 feet, which appears to be marginally acceptable, at least initially. This two-lane improvement should occur in Phases 2 or 3 of CLIBP.
- Fink Road – The County will improve Fink Road between I-5 and Bell Road with an added overlay and striping during Phase 1A to ensure a clean functional entrance to the CLIBP.

Ike Crow Road and Marshall Road near CLIBP

Off-site Two Lane Roadways Needing Widening to Four Lanes

As noted above, some roadways need widening to four lanes as a result of project-only traffic, some need widening because of regional growth to 2035, while others need widening by a combination of traffic from the project and regional growth. For this purpose, the emphasis is on existing plus project traffic. See Figure 5 for off-site improvement recommendations and phasing.

Marshall Road – CLIBP entrance to SR 33. The approximate length of this roadway is 2,000 feet. Four lanes will be needed by the midpoint of Phase 2 development. This is the only roadway needing widening to four lanes as a result of the CLIBP project.

Off-site Traffic Signals Needed
The following locations are expected to satisfy peak hour signal warrants. The affected agencies may wish to consider the applicability of roundabouts in lieu of traffic signals when the warrants are met.

14. Sperry Ave at SR 33
17. Carpenter Rd at W. Main St
18. Crows Landing Rd at W. Main St
19. Crows Landing Rd and Marshall Road
20. Marshall Rd at SR 33
22. Marshall Rd at Ward Ave
24. W. Ike Crow Rd at SR 33
25. Fink Rd at SR 33
26. Fink Rd at Bell Rd
29. Fink Rd at I-5 NB ramps

A. Marshall Rd at North CLIBP entrance

B. Fink Rd at South CLIBP entrance

Some of these intersections have been included in the City of Patterson General Plan as locations eventually needing traffic signals. These locations satisfy warrants based on existing traffic plus CLIBP traffic. Of these locations, intersections 14, 24, 26 and B are the highest priority, likely needed during the later stages of Phase 1 or the beginning of Phase 2 conditions.

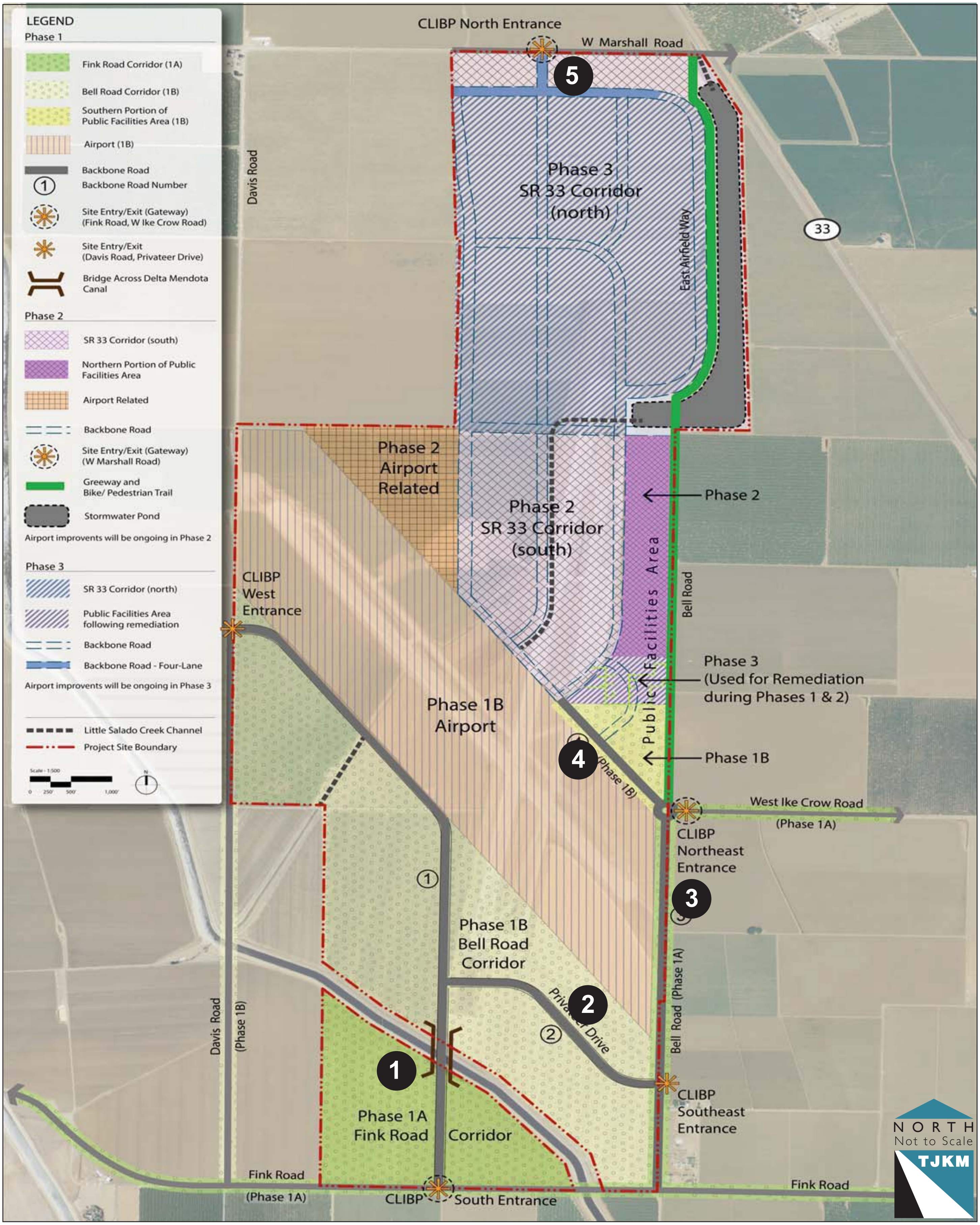
Fink Road Interchange Improvements
The Fink Road interchange is less likely to be used by CLIBP employee traffic because it does not lead to the major locations where employees are likely to live – Patterson, Newman, Gustine and SR 99 Corridor cities in Stanislaus County. The interchange is likely to be used by trucks from CLIBP. Improvements recommended for the Fink Road interchange include signalizing the northbound ramps by Phase 1B conditions along with widening the roadway beneath the freeway as much as possible to create a westbound left turn lane at the southbound ramps intersection. By the completion of the CLIBP, the southbound ramp intersection will also need to be signalized. It is worth noting that there are physical constraints for expanding capacity at this interchange. Widening the Fink Road undercrossing will be difficult due to the location of existing underpass support columns. The situation is compounded by the limited space within the interchange vicinity for possible construction detours. However, no improvements beyond those identified above appear necessary. Figure 5 summarizes the recommended infrastructure phasing in the vicinity of the project.

City of Patterson Impacts
There are two intersections in the City of Patterson that have unacceptable levels of service under existing plus project conditions.

- I-5 SB Ramps / Sperry Avenue – This intersection is part of interchange improvements now being planned as a joint City/County/State project.
- Ward Avenue / Sperry Avenue – This intersection registers LOS F in the a.m. and p.m. with project traffic added, as was predicted in the Patterson General Plan. This is difficult to improve due to the narrow roadway hemmed in by development on the south leg. Eventually, the construction of the South County Corridor north of Patterson will likely relieve Sperry Avenue of some through traffic. (See the discussion elsewhere on the status of the South County Corridor.)The General Plan calls for additional lanes at the intersection, but these may be difficult to achieve.

Backbone Roads Identification

Figure 4

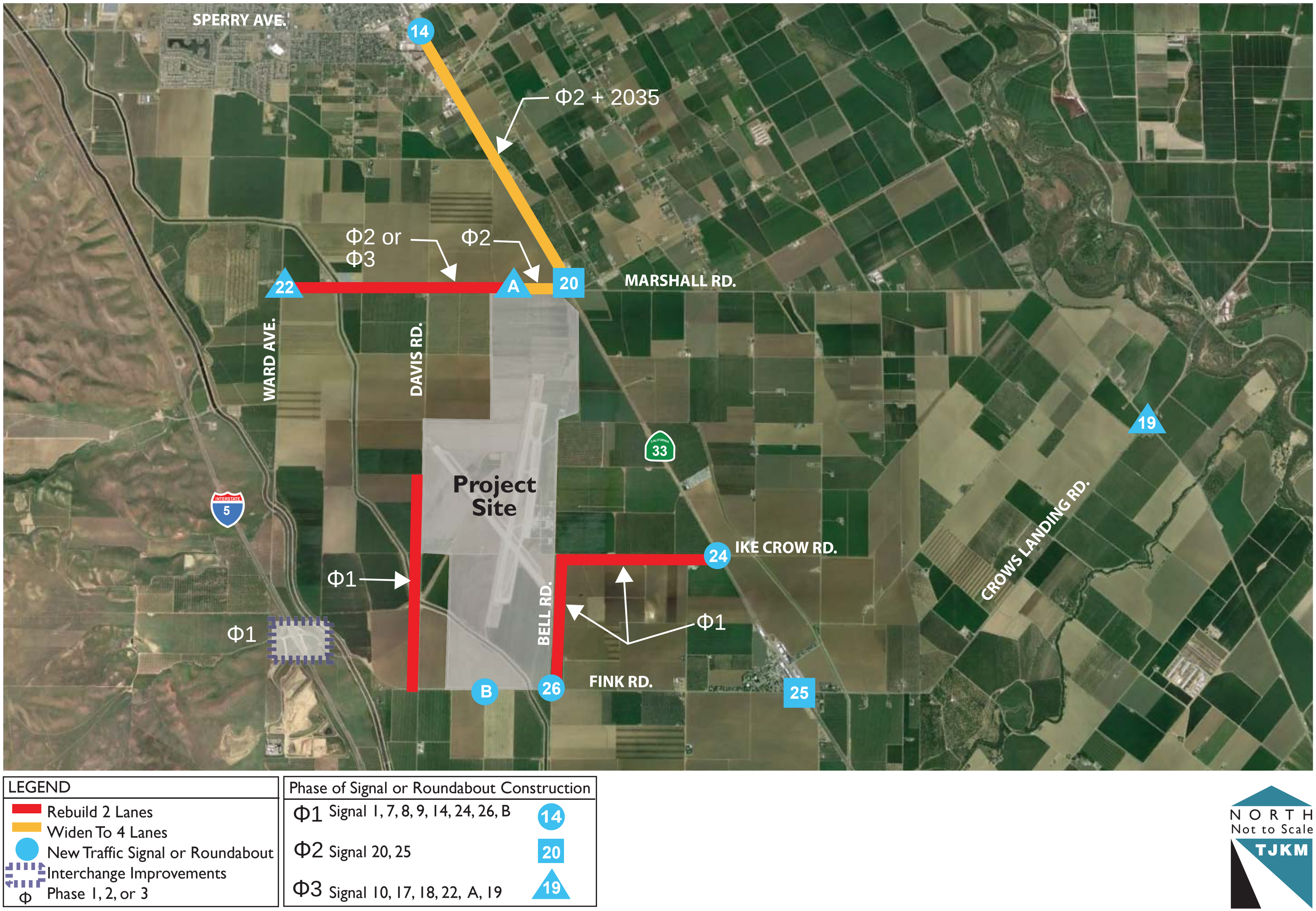


Source: AECOM

Stanislaus County - Crows Landing Industrial Business Park Transportation Infrastructure Master Plan

Infrastructure Construction Phasing

Figure 5



101-035 - 10/10/17 - CDK

2035 Conditions

This section analyzes 2035 traffic conditions in the study area both with and without the CLIBP Project.

Modeling Network

The 2035 network for the Tri-County model reflects all existing and anticipated new roadway segments in San Joaquin, Stanislaus and Merced Counties. The future I-5/Zacharias Road interchange was not assumed for the 2035 networks since CLIBP does not contribute to future traffic at this location.

Proposed Project Description

The identical project described earlier was included in the 2035 Plus CLIBP scenario. The layout, land use, building square footage and employee estimates are unchanged. The project trip generation is also unchanged.

Analysis Results

Table VIII shows the results of the intersection level of service analysis for 2035 conditions without the proposed project.

Crows Landing Road at San Joaquin River

Table VIII: Intersection Levels of Service - 2035 without the Project

ID	Intersection Name	Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay	LOS	Meet Signal Warrant	Delay	LOS	Meet Signal Warrant
1	I-5 SB / Sperry Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
2	I-5 NB Ramps / Sperry Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
3	Rogers Rd / Sperry Ave	Signal	26.1	C	-	25.2	C	-
4	Baldwin Rd / Sperry Ave	Signal	25.4	C	-	30.2	C	-
5	American Eagle / Sperry Ave	Signal	19.5	B	-	11.9	B	-
6	Las Palmas Ave / Sperry	Signal	16.8	B	-	18.7	B	-
7	Ward Ave / Sperry Ave	Signal	59.4	**E**	-	33.3	C	-
8	Ward Ave / Las Palmas	Signal	30.1	C	-	22.9	C	-
9	Ward Ave / M Street	Signal	35.5	-D	-	33.3	C	-
10	Ward Ave / SR 33	OWSC	230	**F**	**Y**	107.3	**F**	**Y**
11	Olive Ave / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
12	Walnut Ave / SR 33	Signal	37.4	D	-	29.7	C	-
13	Las Palmas Ave / SR 33	Signal	21.0	C	-	21.0	C	-
14	Sperry Ave / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
15	Sycamore / Las Palmas Ave	Signal	37	D	-	20.2	C	-
16	Elm Ave / Las Palmas Ave	Signal	16.3	B	-	15.6	B	-
17	Carpenter Rd / W. Main	AWSC	143.0	**F**	**Y**	98.9	**F**	**Y**
18	Crows Landing / W. Main St	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
19	Crows Landing / Marshall Rd	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
20	Marshall Rd / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
21	Marshall Rd / Davis Rd	OWSC	8.5	A	N	9.8	A	N
22	Marshall Rd / Ward Ave	OWSC	16.1	C	N	12.1	B	N
23	Ike Crow Rd / Bell Rd	TWSC	8.8	A	N	8.9	A	N
24	Ike Crow Rd / SR 33	TWSC	16	C	N	15.4	C	N
25	Fink Rd / SR 33	AWSC	>150	**F**	**Y**	118.2	**F**	**Y**
26	Fink Rd / Bell Rd	TWSC	13.2	B	N	12.1	B	N
27	Fink Rd / Davis Rd	TWSC	13.9	B	N	12.8	B	N
28	Fink Rd / Ward Ave	OWSC	26.2	D	N	14.7	B	N
29	I-5 NB Ramps / Fink Rd	OWSC	14.2	B	N	12.7	B	N
30	I-5 SB Ramps / Fink Rd	OWSC	14.4	B	N	61	**F**	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Bold and Shaded values indicate unacceptable LOS conditions and signal warrant met with 2035 conditions
Source: TJKM Transportation Consultants, January 2015.

Table IX summarizes the results of the roadway segment level of service analysis. The table shows both existing number of lanes and the number of lanes required to operate a roadway facility acceptably under 2035 Conditions without the proposed project.

Table IX: Roadway Segment Level of Service - 2035 without the Project

ID	Roadway Segment	Existing # of Lanes	Jurisdiction	LOS Threshold	2035 Baseline Conditions		
					ADT	LOS	Lanes required
1	Fink Rd between Ward Ave and Davis Rd	2	County	C	5,767	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	County	C	5,619	C or Better	2
3	Fink Rd between Bell Rd and SR 33	2	County	C	5,764	C or Better	2
4	SR-33 south of Stuhr Rd north of Newman	2	Caltrans	C-D	16,757	D	2
5	SR-33 between Stuhr Rd and Fink Rd	2	Caltrans	C-D	10,296	C or Better	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	Caltrans	C-D	5,588	C or Better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	Caltrans	C-D	5,516	C or Better	2
8	SR-33 between Marshall Rd and Sperry Ave	2	Caltrans	C-D	10,297	C or Better	2
9	Ike Crow Rd between SR-33 and Bell Rd	2	County	C	23	C or Better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	County	C	44	C or Better	2
11	Davis Rd south of Marshall Rd	2	County	C	74	C or Better	2
12	Marshall Rd between SR-33 and Davis Rd	2	County	C	1,327	C or Better	2
13	Marshall Rd between Davis Rd and Ward Ave	2	County	C	1,309	C or Better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	County	C	5,347	C or Better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	County	C	4,334	C or Better	2
16	W. Main St west of Carpenter Rd	2	County	C	21,196	**E**	4
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	County	C	10,626	C or Better	2
18	W. Main St east of Crows Landing Rd	2	County	C	14,805	**E**	2
	Freeway Segment						
19	I-5 n/o Sperry Ave	4	Caltrans	C-D	70,368	**E**	6
20	I-5 between Fink Rd and Sperry Ave	4	Caltrans	C-D	66,883	D	4
21	I-5 s/o Fink Rd	4	Caltrans	C-D	64,328	D	4

Notes: LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Shading indicates widening not required in earlier scenarios. State highway 4-lane trigger is 20,000 ADT, non-state highway is 16,040 ADT. Freeway trigger for six lanes is 68,900 ADT.
Source: TJKM Transportation Consultants, January 2015.

Table X shows the results of the intersection level of service analysis for 2035 conditions with the proposed project. Table XI summarizes the results of the roadway segment level of service analysis.

Table X: Intersection Levels of Service - 2035 plus Project Conditions

ID	Intersection	Type of Control	A.M. Peak Hour			P.M. Peak Hour		
			Delay In Sec.	LOS	Meet Signal Warrant?	Delay In Sec.	LOS	Meet Signal Warrant?
1	I-5 SB Ramps / Sperry Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
2	I-5 NB Ramps / Sperry Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
3	Rogers Rd / Sperry Ave	Signalized	38.9	D	-	32.3	C	-
4	Baldwin Rd / Sperry Ave	Signalized	45	D	-	53	D	-
5	American Eagle Way / Sperry Ave	Signalized	24	C	-	12	B	-
6	Las Palmas Ave / Sperry Ave	Signalized	29	C	-	21	C	-
7	Ward Ave / Sperry Ave	Signalized	144	**F**	-	100	**F**	-
8	Ward Ave / Las Palmas Ave	Signalized	35.1	D	-	31.4	C	-
9	Ward Ave / M St	Signalized	48.0	D	-	38.9	D	-
10	Ward Ave / SR 33	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
11	Olive Ave / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
12	Walnut Ave / SR 33	Signalized	44.5	D	-	39.5	D	-
13	Las Palmas Ave / SR 33	Signalized	30.6	C	-	24.1	C	-
14	Sperry Ave / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
15	Sycamore Ave / Las Palmas Ave	Signalized	44	D	-	20	C	-
16	Elm Ave / Las Palmas Ave	Signalized	21	C	-	17	B	-
17	Carpenter Rd / W. Main St	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
18	Crows Landing Rd / W. Main St	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
19	Crows Landing Rd / River Rd	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
20	Marshall Rd / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
21	Marshall Rd / Davis Road	OWSC	*Note: Davis discontinued with project in place*					
22	Marshall Rd / Ward Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
23	Ike Crow Rd / Bell Rd	TWSC	37	**E**	N	17	C	N
24	Ike Crow Rd / SR 33	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
25	Fink Rd / SR 33	AWSC	>150	**F**	**Y**	>150	**F**	**Y**
26	Fink Rd / Bell Rd	TWSC	>150	**F**	**Y**	>150	**F**	**Y**
27	Fink Rd / Davis Rd	TWSC	>150	**F**	**Y**	45	**E**	N
28	Fink Rd / Ward Ave	OWSC	>150	**F**	**Y**	>150	**F**	**Y**
29	I-5 NB Ramps / Fink Rd	OWSC	>150	**F**	**Y**	15	C	N
30	I-5 SB Ramps / Fink Rd	OWSC	>150	**F**	**Y**	>150	**F**	N

Notes: OWSC = One Way Stop Control, TWSC = Two Way Stop Control, AWSC = All Way Stop Control, LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Shading indicates signals not warranted under 2035 Baseline scenario

Source: TJKM Transportation Consultants, January 2015.

Table XI: Roadway Segment Level of Service - 2035 plus Project Conditions

ID	Roadway Segment	Existing # of Lanes	2035 Baseline Conditions			2035 plus Project Conditions		
			ADT	LOS	# of Lanes Required	ADT	LOS	# of Lanes Required
1	Fink Rd between Ward Ave and Davis Rd	2	5,767	C or Better	2	10,902	C or Better	2
2	Fink Rd between Davis Rd and Bell Rd	2	5,619	C or Better	2	8,032	C or Better	2
3	Fink Rd between Bell Rd and SR 33	2	5,764	C or Better	2	13,709	D	2
4	SR-33 south of Stuhr Rd north of Newman	2	16,757	D	2	23,599	**E**	**4**
5	SR-33 between Stuhr Rd and Fink Rd	2	10,296	C or Better	2	18,000	D	2
6	SR-33 between Fink Rd and Ike Crow Rd	2	5,588	C or Better	2	12,183	C or better	2
7	SR-33 between Ike Crow Rd and Marshall Rd	2	5,516	C or Better	2	14,986	D	2
8	SR-33 between Marshall Rd and Sperry Ave	2	10,297	C or Better	2	25,030	**F**	**4**
9	Ike Crow Rd between SR-33 and Bell Rd	2	23	C or Better	2	2,865	C or better	2
10	Bell Rd between Fink Rd and Ike Crow Rd	2	44	C or Better	2	6,806	C or better	2
11	Davis Rd south of Marshall Rd	2	74	C or Better	2	-	-	-
12	Marshall Rd between SR-33 and Davis Rd	2	1,327	C or Better	2	32,663	D	2
13	Marshall Rd between Davis Rd and Ward Ave	2	1,309	C or Better	2	5,006	C or better	2
14	Ward Ave between Marshall Rd and Patterson City Limits	2	5,347	C or Better	2	9,103	C or better	2
15	Crows Landing Rd between Fink Rd and Marshall Rd	2	4,334	C or Better	2	9,715	C or better	2
16	W. Main St west of Carpenter Rd	2	21,196	**E**	4	22,318	**E**	4
17	Crows Landing Rd between Carpenter Rd and W. Main St	2	10,626	C or Better	2	17,849	D	2
18	W. Main St east of Crows Landing Rd	2	14,805	D	2	17,213	D	2
	Freeway Segment							
19	I-5 n/o Sperry Ave	4	70,368	**E**	6	71,690	**E**	**6**
20	I-5 between Fink Rd and Sperry Ave	4	66,883	D	4	69,628	**E**	**6**
21	I-5 s/o Fink Rd	4	64,328	D	4	65,338	D	4

Notes: Using Florida Capacity Method 2012
LOS = Level of Service
Bold values indicate unacceptable LOS conditions
Shading indicates widening not justified under any earlier scenarios. State highway 4-lane trigger is 16,000 ADT, non-state highway is 14,580 ADT. Freeway trigger for 6 lanes is 68,900 ADT.

Source: TJKM Transportation Consultants, January 2015.

Additional Patterson Segment Analysis

The City of Patterson requested that additional roadway segments in or near the City be evaluated under 2035 conditions. These are described below:

1. Sperry Road between Rogers Road and Ward Avenue: This is planned to be a four lane roadway. This is expected to have a daily count of 19,300 vehicles per day in 2035 with project volumes. The project contributes 24.6 percent of these volumes. With four lanes, this section will operate at LOS C without the project and LOS D with the project.
2. Sperry Road from Ward Avenue to SR 33: As a two-lane roadway the expected 2035 plus project volumes will be 9,015 vehicles per day, of which 38.6 percent are project volumes. This roadway operates at LOS B with and without the project.
3. Ward Avenue from SR 33 to Patterson City Limits: This two-lane roadway is expected to carry 4,145 vehicles per day under 2035 plus project conditions, of which 31.4 percent are contributed by the project. This roadway operates at LOS A with and without the project.
4. SR 33 south of Las Palmas Avenue: This four-lane roadway is expected to have 15,445 vehicles per day in 2035 with project conditions, of which 25.3 percent are contributed by the project. This roadway operates at LOS B without the project and LOS C with the project.
5. SR 33 from Zacharias Road to M Street: This two-lane roadway will carry 7,870 vehicles in 2035 with the project, of which 18.8 percent are contributed by the project. The roadway operates at LOS B with and without the project.

Additional Newman Analysis

The City of Newman called attention to information in the City of Newman General Plan and the Northwest Newman Master Plan and their traffic studies.

Included in the two traffic studies, Table 6 of the General Plan traffic report indicates that within the City SR 33 will average 36,000 vpd at buildout. The General Plan indicates that within the City SR 33 will eventually be widened to four lanes. With 8,200 vpd existing, SR 33 will grow by 27,800 vpd. The Specific Plan study notes that at the busiest location along SR 33, the Specific Plan will contribute approximately 7,700 vehicles per day (vpd). In this case, Specific Plan volumes constitute 28 percent of the growth. It is recognized that a major portion of the growth in trips will be current and future residents of Newman who will be employed within the Specific Plan Area. If the traffic is split 50-50 to account for one trip end in Newman and one trip end in the Specific Plan Area, a reasonable fair share for Newman impacts caused by Specific Plan traffic is approximately 14 percent.

The Newman traffic studies indicate that future traffic signals in the SR 33 corridor in and near Newman will include intersections at Stuhr Road, Jensen Road, Yolo Street, and Inyo Street. Traffic from the Specific Plan will contribute to all four of the new traffic signals. These studies seem reasonable; they are based on generalized information of traffic signals being warranted when total intersection volumes reach 24,000 vpd with at least 3,000 vehicles on one leg of the side street. All four of the signals may not be warranted for many years. However, about 28 percent of the future traffic will be related to Specific Plan buildout. As noted, one half of these trips are generated locally from homes or businesses. For this reason, the Specific Plan's fair share of these impacts is about 14 percent.

Inyo Street is one of the four locations along SR 33 identified as likely to meet traffic signal warrants as a result of growth in traffic. When the General Plan traffic studies were conducted, Inyo Street at SR 33 appeared to be the most congested downtown intersection on SR 33. Therefore, it is likely that it may be the first to meet signal warrants. When these and other SR 33 intersections meet signal warrants, the 14 percent fair share described above would be a reasonable contribution from the Specific Plan.

2035 Triggers

2035 No Project

Tables VIII and IX show the level of service results for 2035 No Project conditions. In this scenario, four additional intersections not previously identified meet traffic signal warrants during one or more of the peak hours. These are:

1. I-5 SB /Sperry Avenue
2. I-5 NB/ Sperry Avenue
10. Ward Avenue/ SR 33
11. Olive Avenue/ SR 33

Two roadway segments require widening for the first time:

16. W. Main Street west of Carpenter Road
19. I-5 north of Sperry Avenue needs widening to six lanes

These are intersections and roadways whose signalization or widening are not triggered by CLIBP.

2035 Plus CLIBP

Tables X and XI show the level of service results for 2035 Plus CLIBP conditions. In this scenario four additional intersections not previously identified meet signal warrants during one or more peak hour periods. These are:

27. Fink Road / Davis Road
28. Fink Road / Ward Avenue
29. I-5 NB Ramps / Fink Road
30. I-5 SB Ramps / Fink Road

Three roadway segments require widening for the first time:

8. SR 33 between Marshall Road and Sperry Avenue
4. SR 33 between Stuhr Road and Fink Road
20. I-5 between Fink Road and Sperry Avenue

Comments on 2035 and 2035 plus Project Widening
E. Las Palmas / W. Main Street – SR 33 to S. Carpenter Road. This western section of this roadway – from SR 33 to Poplar Avenue – is approximately 13,200 feet in length and has three lanes. This three-lane section should be adequate to accommodate CLIBP traffic plus regional growth, particularly since the local agencies are considering the South County Corridor expressway, which may be on a different alignment. The two-lane section of West Main Street between Poplar Avenue and S. Carpenter Road is 17,500 feet long. Again, because of the possibility that the South County Corridor expressway may be on a different alignment, the need for widening is not certain. This section of roadway includes a 750-foot long bridge over the San Joaquin River. (There is a current Stanislaus County project to investigate upgrading this bridge to meet current standards.) TJKM recommends that improvements to this corridor not be included in the initial CLIBP requirements but be handled with a traffic fee arrangement.

SR 33 – From Marshall Road to Sperry Avenue. The approximate length of this roadway is 12,300 feet. In Patterson, the four-lane section of SR 33 has a width of about 60 feet for four-lanes undivided plus parking on one side. The ideal width in this section has four through lanes, about 14 feet for a median or TWLT, and two eight-foot shoulders, or 78 feet of pavement. This corresponds to County standard "110 FT MINOR ARTERIAL 4-LANE RURAL, shown on Plate 3-A15. Widening is needed by the completion of Phase 2 of the development when combined with 2035 growth traffic. During Phases 2 and 3, the State and the County may wish to consider spot improvements consisting of a third center left turn lane at existing public and selected private intersections. Such improvements would enhance both the safety and capacity of SR 33 and delay the need for four lanes.

SR 33 – South of Stuhr Road north of Newman. This section of roadway will exceed two-lane capacity by the end of Phase 3 when combined with 2035 growth traffic. SR 33 through Newman is projected in its General Plan to have an ultimate width of four lanes south of Stuhr Road in and north of the existing city limits. Note the earlier section of this report *(Additional Newman Analysis*) for additional details.

Fair Share Analysis

Tables XII and XIII list all of the projects for which CLIBP has at least partial responsibility. The project share is calculated based on each project's share of the total growth in traffic defined as 2035 plus project less existing conditions. In this case, TJKM utilized the summation of all intersection approach volumes, a.m. plus p.m., in existing, 2035 no project, and 2035 plus project scenarios to determine the components of the calculation.

The same approach is used for segment analyses – in which daily segment volumes are determined for existing, 2035 no project, and 2035 plus project conditions at a point in a roadway segment. This is the methodology recommended by Caltrans.

Table XII: Fair Share Analysis - Intersections

No.	Intersection Improvements	Existing (A)	2035 + P (B)	Project (C)	Project Share = (C) / (B-A)	LOS Before	LOS After
14	Sperry Avenue / SR 33	1667	4553	1513	52%	F	A - C
17	Carpenter Road / Main Street	1490	3696	810	37%	F	"
18	Crows Landing Rd / Main Ave	1829	5793	1142	29%	F	"
22	Marshall Road / Ward Ave	239	4743	3354	74%	F	"
20	Marshall Road / SR 33	758	8417	6015	79%	F	"
-	Marshall Road/ Project Entrance				100%	F	"
24	Ike Crow Road / SR 33	630	3840	2409	75%	F	"
26	Fink Road / Bell Road	267	3333	2461	80%	F	"
-	Fink Road / Project Entrance				100%	F	"
19	Crows Landing Rd / Marshall Rd	1131	9211	3838	48%	F	"
25	Fink Road / SR 33	1126	6284	2935	57%	F	"
29	I-5 NB Ramps / Fink Road	262	2549	1075	47%	F	"
1	I-5 SB Ramps / Del Puerto Cyn. Rd	842	3736	479	17%	F	"
2	I-5 NB Ramps / Sperry Ave	1412	4926	707	20%	F	"
10	Ward Avenue / SR 33	1155	3060	363	19%	F	"
11	Olive Avenue / SR 33	1101	2860	322	18%	F	"
27	Fink Road / Davis Road	263	2154	1290	68%	F	"
28	Fink Road / Ward Avenue	310	3247	1693	58%	F	"
30	I-5 SB Ramps / Fink Road	181	1292	548	49%	F	"

Table XIII: Fair Share Analysis - Segments

No.	Roadway Improvements (lanes)	Existin g (A)	2035 + P (B)	Project (C)	D = (C) / (B-A)	LOS Before	LOS After
12	Marshall Rd - SR 33 to Entrance (4)	656	32,663	31,336	98%	E	D
9	Ike Crow Rd - SR 33 to Bell Rd (2)	27	2,865	2,842	100%	B	B
10	Bell Rd - Ike Crow to Fink Rd (2)	50	6,806	6,762	100%	B	B
13	Marshall Rd - Ward to Entrance (2)	641	5,006	3,697	85%	B	B
8	SR 33 - Marshal Rd to Sperry (4)	4,161	25,030	14,733	71%	F	D
4*	SR 33 - Stuhr Road to Newman (4)	8,200	36,000	7,700	28%	F	E
16	W. Main - West of Carpenter (4)	7,342	22,318	1,122	7%	E	B
F1	I-5 - North of Sperry Road (6)	40,000	71,690	1,322	4%	E	B
F2	I-5 - Fink Rd to Sperry Ave (6)	38,000	69,628	2,745	9%	E	B

* See *Additional Newman Analysis* for more details.

City of Patterson Cumulative Impacts

Under cumulative conditions, there are five signalized intersections in Patterson that will have unacceptable levels of service without project traffic and one additional signalized intersection in which the combination of project traffic and cumulative traffic causes the intersection to operate under unacceptable conditions. The intersections with unacceptable conditions without the project are as follows:

- Ward Avenue / Sperry Avenue – This intersection was cited as a problem under near term plus project conditions. However, even without CLIBP, this intersection fails. The development of the South County Corridor, an expressway linking SR 99 and I-5 immediately north of Patterson, should reduce traffic pressures in most of the problem intersections. See the discussion on the status of the South County Corridor.

No Patterson intersections degrade to unacceptable conditions when CLIBP traffic is added to cumulative traffic.

Transportation Demand Management

Transportation Demand Management (TDM) is a general term referring to strategies that result in more efficient use of transportation resources. The overall goal of TDM is to influence traveler behavior in order to reduce or redistribute travel demand. Strategies can be developed based on such overall TDM objectives as congestion reduction; energy conservation and emission reduction; health and fitness; improving equity; community livability; parking solutions; safety; and transportation affordability.

TJKM recommends that prior to the occupancy of the first building within the Crows Landing Industrial Business Park a TDM program shall be prepared which includes the following elements:

1. Establishment of a comprehensive strategy to reduce solo occupant vehicle travel by employees, business vehicles including trucks, and visitors.
2. The County shall establish TDM goals for CLIBP which include the reduction of daily travel and the reduction of daily travel within a.m. and p.m. peak periods.
3. The TDMP shall establish a TDM organization that requires mandatory involvement by all companies within the CLIBP. There shall be person(s) assigned representing CLIBP on an ongoing basis to coordinate with individual businesses.
4. Each individual business shall establish a designated TDM company representative.
5. The CLIBP TDM organization shall include mandatory annual employee surveys with a required response of at least 90 percent of the employees. The surveys will include as a minimum mode and time of travel by employees.
6. The CLIBP TDM organization shall prepare an annual report indicating status of compliance with the TDM goals established by the County.
7. The individual companies and the CLIBP TDM organization shall consider the following items to achieve compliance with the TDM goals:
    a. Encourage employers to utilize flex-time
    b. Carpool matching programs
    c. Preferred parking for carpoolers
    d. Van pool programs
    e. On-site facilities such as break rooms and shower facilities
    f. Establishment of employer sponsored shuttles from Turlock and Modesto

g. On-site secure bicycle racks
h. Bike share programs for employee usage at lunchtime
i. Other measures

CLIBP includes a bicycle and pedestrian trail that extends between Fink Road and Marshall Road. This facility is intended to be an auxiliary transportation facility rather than a recreational facility. The County and the City of Patterson should make efforts to extend the facility to Patterson to facilitate commute options.

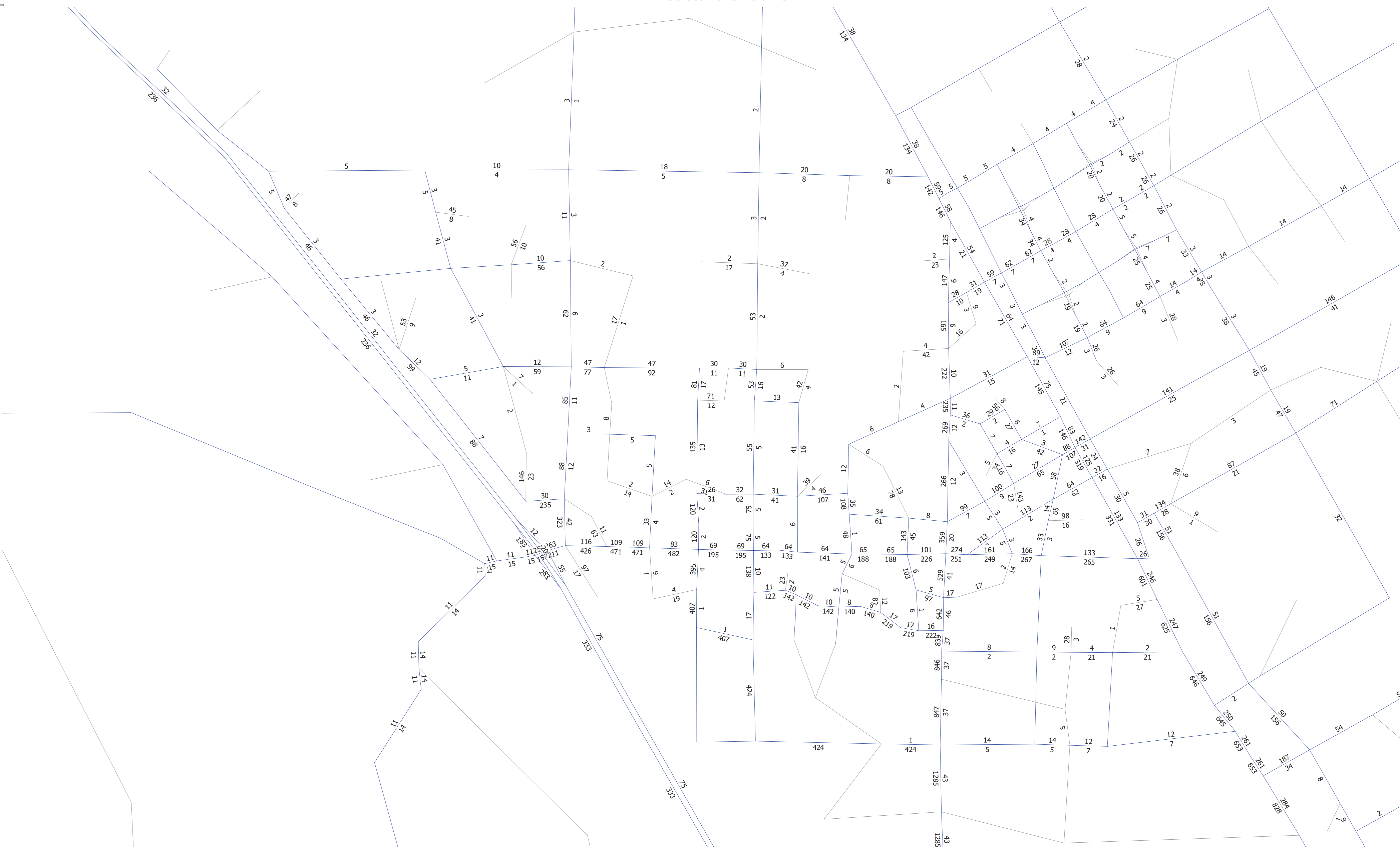
Study Participants

TJKM Transportation Consultants

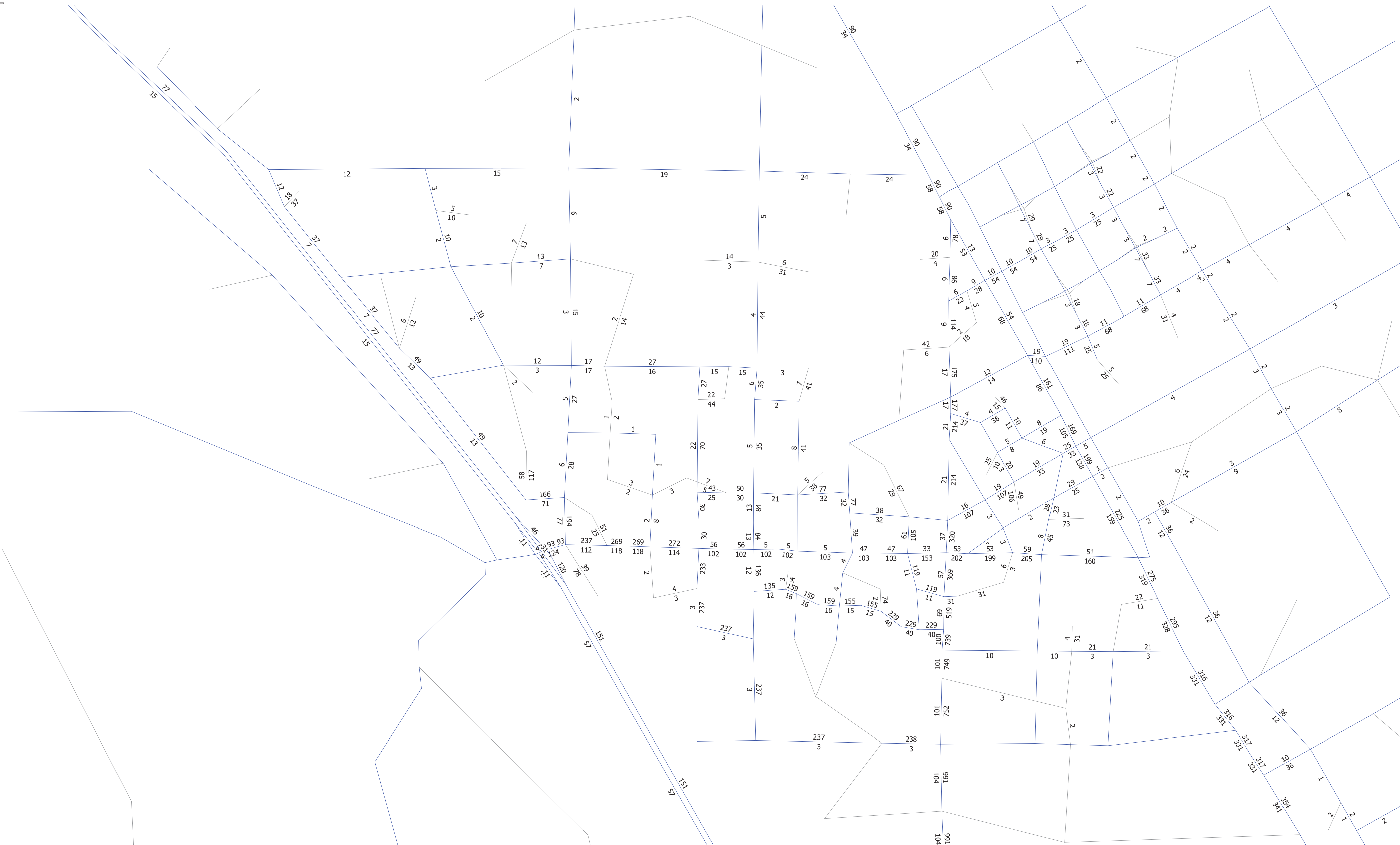
Chris D. Kinzel, P.E.	Project Director
Arthur Chen	Transportation Engineer
Prashanth Dullu	Transportation Engineer
Dan Harrison	Graphics Specialist

Appendix A

A.M. and P.M. Plots of Project Traffic


Crows Landing 2035 Model
AM PH Select Zone Volume
(Licensed to TJKM Transportation Consultants)
cube

Crows Landing 2035 Model
PM PH Select Zone Volume



APPENDIX B

Groundwater Resources Impact Assessment

Groundwater Resources Impact Assessment

Crows Landing Industrial Business Park
Stanislaus County, California

October 31, 2016

Prepared for:

Stanislaus County
Division of Public Works
1716 Morgan Road
Modesto, California 95358

Prepared by:

JACOBSON | JAMES
& associates, inc
9083 Foothills Blvd., Suite 370
Roseville, California 95747
916.367.5111

Groundwater Resources Impact Assessment

Crows Landing Industrial Business Park
Stanislaus County, California

October 31, 2016

Stanislaus County
Striving to be the Best

Prepared By

Joel Bauman, PG, PMP
Principal Geologist

REGISTERED GEOLOGIST
MICHAEL TIETZE
No. HG 63
EXP. 4/30/2017
CERTIFIED HYDROGEOLOGIST
STATE OF CALIFORNIA

Reviewed By

Mike Tietze, PG, CEG, CHG
Principal Engineering Geologist

JACOBSON | JAMES
& associates, inc

9083 Foothills Blvd., Suite 370
Roseville, California 95747
(916) 367-5111

TABLE OF CONTENTS **PAGE**

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AFY	acre-feet per year
amsl	above mean sea level
bgs	below ground surface
CEQA	California Environmental Quality Act
CLIBP	Crows Landing Industrial Business Park
CVP	Central Valley Project
DMGS	Delta-Mendota Groundwater Subbasin
DPWD	Del Puerto Water District
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ft/day	foot per day
GDE	groundwater-dependent ecosystem
gpd/ft^2	gallon per day per square foot
gpm	gallon per minute
gpm/ft	gallon per minute per foot
GSP	Groundwater Sustainability Plan
JJ&A	Jacobson James & Associates, Inc.
KDSA	Kenneth D. Schmidt and Associates
LID	Low Impact Development
MCL	Maximum Contaminant Level
MM	Mitigation Measure
NASA	National Aeronautics and Space Administration
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan

1.0 INTRODUCTION

1.1 Background

Stanislaus County proposes rezoning of the former National Aeronautics and Space Administration (NASA) Crows Landing Air Facility to construct the Crows Landing Industrial Business Park (CLIBP), located in Stanislaus County south of Patterson, California (the Project). The CLIBP proposes to use groundwater as a water supply during construction and operation. This Groundwater Resources Impact Assessment Report has been prepared by Jacobson James & Associates, Inc. (JJ&A) on behalf of the Stanislaus County Department of Public Works, to provide information regarding groundwater resources that will be incorporated into the environmental analysis of the proposed Project under the California Environmental Quality Act (CEQA). Specifically, this report describes the affected groundwater resources environment, the groundwater resources demand and development activities associated with the proposed CLIBP, and the methods and results of a groundwater resources impact assessment for the proposed Project. The information contained in this report will be incorporated into the Environmental Impact Report (EIR) prepared for the Project.

1.2 Organization

This report includes the following sections:

- Chapter 1*, Introduction*, which identifies the background, purpose and scope of the study.
- Chapter 2, *Project Description*, which provides a brief overview of the proposed Project and discusses the anticipated water demand and proposed groundwater supply development activities.
- Chapter 3, *Project Setting*, which provides an overview of the project setting, with a particular focus on hydrogeology and groundwater resources.
- Chapter 4, *Drawdown Evaluation*, which presents the methods and results of an evaluation of the proposed groundwater extraction on groundwater levels and flow.
- Chapter 5, *Groundwater Resources Impact Analysis*, which presents a reasoned analysis of the potential impacts of the proposed groundwater supply development associated with the project on the environment.
- Chapter 6, *References*, which includes a list of documents cited in this report.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

CLIBP is a conceptually planned development that encompasses the reuse of the former Crows Landing Air Facility, which was decommissioned by NASA in the late 1990s. The proposed CLIBP location is shown on Figure 2.1.1, and includes approximately 1,528 acres of land (hereinafter the Site). The proposed CLIBP layout is shown on Figure 2.1.2. The CLIBP is planned to include aviation, multimodal transportation, industrial and commercial facilities, which are proposed to be constructed on 1,261 developable acres in three phases:

- Phase 1 will be developed between 2017 and 2026, and includes construction of approximately 810 acres of aviation, multimodal, industrial and commercial facilities;
- Phase 2 will be developed from 2027 to 2036, and consists of construction of an additional 177 acres of multimodal, industrial and commercial facilities; and
- Phase 3 will be developed between 2037 and 2046, and includes construction of the final 274 acres of multimodal, industrial and commercial facilities.

2.2 Water Demand and Supply Development

A Water Supply Assessment and Water Supply Feasibility Study were prepared for the CLIBP by AECOM (AECOM, 2016a; AECOM and VVH Consulting Engineers, 2016). The water demand for the CLIBP will include potable, irrigation, fire water, and other non-potable water needs, and is proposed to be supplied from a combination of existing and new groundwater supply wells at the Site. As discussed further in Section 3.4, the groundwater resources beneath the Site that are available for supply development include a shallow unconfined aquifer that is separated from a deeper confined aquifer by a relatively impermeable regional aquitard layer referred to as the Corcoran Clay.

Table 2.2.1 below summarizes the projected water demand as the CLIBP is developed over time. The demand is presented as the estimated total at full buildout of each development phase. The project will develop a non-potable water supply using combination of the existing irrigation wells that derive water from both the shallow and deep aquifer, and new non-potable supply wells installed into the shallow aquifer beneath the Site. The project potable water supply will be developed using new wells installed into the confined aquifer beneath the Site.

Table 2.2.1 Project Groundwater Demand and Supply

Time Period	Annual Groundwater Demand at Completion of Each Buildout Phase (acre-feet/year [AFY]) Phase 1 2017 to 2026	Phase 2 2027 to 2036	Phase 3 2037 to 2046
Estimated Total Potable Demand	739	1,036	1,496
Estimated Total Non-Potable Demand	818	1,014	1,323
Estimated Total Project Demand	**1,557**	**2,053**	**2,819**
Potable Supply from New Confined Aquifer Wells	739	1,036	1,496
Non-Potable Supply from Existing Wells	818	834	834
Non-Potable Supply from New Shallow Aquifer Wells	0	183	489

The Project non-potable water supply will be developed as follows:

- As discussed further in Section 3.4.4 and summarized in Table 3.4.2, the three existing wells at the Site have historically been pumped at an average rate of approximately 834 acre-feet per year (AFY). It is assumed that the existing wells will be capable of supporting groundwater extraction at their historical annual extraction volumes when pumped year round. If the existing wells fail to supply the assumed 834 AFY, they would be supplemented, as needed, through the installation of new wells of similar construction.
- Any non-potable Project water demand in excess of 834 AFY is assumed to be supplied using new shallow aquifer wells that are installed at the Site.
- Optimal locations for the new shallow aquifer wells will be selected based on performance of the existing wells, groundwater level monitoring data developed during project operation, and additional water supply development studies, as needed.
- Shallow groundwater demand in excess of the historical average shallow aquifer extraction rate (183 AFY at Phase 2 buildout and 489 AFY at Phase 3 buildout) will be offset by an equivalent volume of increased recharge relative to current conditions, such that the net groundwater extraction rate from the shallow aquifer does not increase above historical levels. This increased shallow aquifer recharge will be derived from a combination of the following sources:[1]
    - Discharge from Little Salado Creek and Marshall Drain will be captured and recharged at facilities constructed for the CLIBP. A long, linear stormwater retention/detention basin

[1] Mitigation Measure (MM) Water-04, described in Section 5.6.4, requires that a Recharge Enhancement Plan be prepared that describes how the Project will achieve sufficient recharge to fully offset any additional groundwater demand on the shallow aquifer imposed by the Project.

will be constructed on the north side of the Site by widening approximately 4,000 feet of Little Salado Creek and Marshall Drain from the current width of approximately 15 feet to over 250 feet, and modifying the streambed to increase its permeability (AECOM, 2016b). The basin will be designed for retention of 200 acre-feet (the estimated runoff volume of a 2-year storm event) and detention of an additional 180 acre-feet. Based on the available information, it is reasonable to expect that several hundred acre-feet per year of groundwater can be recharged to the shallow aquifer in these facilities compared to current conditions.[2]

- Developments within the CLIBP will be required to implement Low Impact Development (LID) standards that promote on-Site stormwater retention and recharge (AECOM, 2016c). Design Goal D-25 requires that all stormwater be retained on the individual lease holds (parcels) to be developed at the CLIBP. This will result in additional recharge relative to the current condition.[3]
- Developments within the CLIBP will be required to employ landscape planting strategies and xeriscape designs to decrease non-potable water demand. The non-potable water demand estimate presented in Table 2.2.1 is based on conservative default development assumptions in Stanislaus County (AECOM, 2016a; AECOM and VVH Consulting Engineers, 2016), and does not consider the implementation of xeriscape planting standards. It is reasonable to assume that landscaping associated with project buildout using these methods can result in a non-potable water demand reduction of several hundred acre-feet, which may be considered net *in lieu* recharge to the shallow aquifer.

The CLIBP potable water supply is assumed to be developed as follows:

- It is assumed that the new water supply wells will be installed into the confined aquifer underlying the Corcoran Clay at the approximate locations shown on Figure 2.1.1. The potable supply wells will be constructed to pump water from the full usable depth of this aquifer. On a preliminary

[2] For perspective, the Little Salado Creek watershed occupies an area of approximately 10.8 square miles and has an average annual discharge of approximately 874 AFY (AECOM, 2016b). The reported discharge in Marshall Drain ranged from 1,147 to 2,731 AFY between 2005 and 2011 (Summers Engineering, 2013), and includes discharge from Little Salado Creek and local agricultural drainage, minus any existing recharge. Recharge from streams is proportional to streambed conductance, which is the product of the streambed thickness and width, times its vertical hydraulic conductivity. The proposed construction of the project retention/detention basin will increase the streambed width by at least an order of magnitude, and modify the bed of the basin to increase its permeability. It is reasonable to assume that construction and maintenance of the basin can increase its conductance by approximately two orders of magnitude, increasing the recharge through the basin by approximately 100-fold relative to the existing condition.

[3] Based on a screening-level evaluation using the U.S. Environmental Protection Agency (EPA) National Stormwater Calculator (EPA, 2014) presented in in Appendix A, it is anticipated that application of LID elements in site-specific construction can capture and infiltrate up to approximately 200 AFY of stormwater relative to Project buildout without parcel-specific LID elements. A detailed analysis relative to current conditions has not been performed, so the amount of recharge compared to current conditions may be different; however, the analysis indicates that significant recharge can be achieved through the implementation of LID elements.

basis, screen intervals are assumed to extend from approximately 320 to 870 feet below ground surface (bgs).

- Groundwater extracted from the confined aquifer for potable use will be treated to meet applicable water quality standards.

2.3 Applicable Regulations

The Site is not located in an adjudicated basin or in a special act district that regulates the extraction of groundwater. The Project would be able to supply groundwater for beneficial use on the properties to be developed in the business park under an appropriative groundwater right. No new entitlements would be required.

Development of groundwater resources to support the Project must comply with the Stanislaus County Groundwater Ordinance adopted in November 2014 (Chapter 9.37 of the Stanislaus County Code), which codifies requirements, prohibitions, and exemptions for permitting new wells with the intent of supporting sustainable groundwater extraction. In addition, the Project will have to comply with the requirements of a Groundwater Sustainability Plan (GSP) that will be adopted for the area by 2020 under California's new Sustainable Groundwater Management Act (SGMA). Stanislaus County's Groundwater Ordinance is deliberately aligned with the requirements of SGMA. Under the Ordinance, unless otherwise exempt, an applicant that wishes to install a new groundwater well must first provide substantial evidence the well is not unsustainably extracting groundwater as defined in the Ordinance and in SGMA. The County has determined that the CLIBP is not exempt from these requirements. The Ordinance and SGMA define unsustainable extraction as causing undesirable results, which are defined as meaning one or more of the following:

a. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

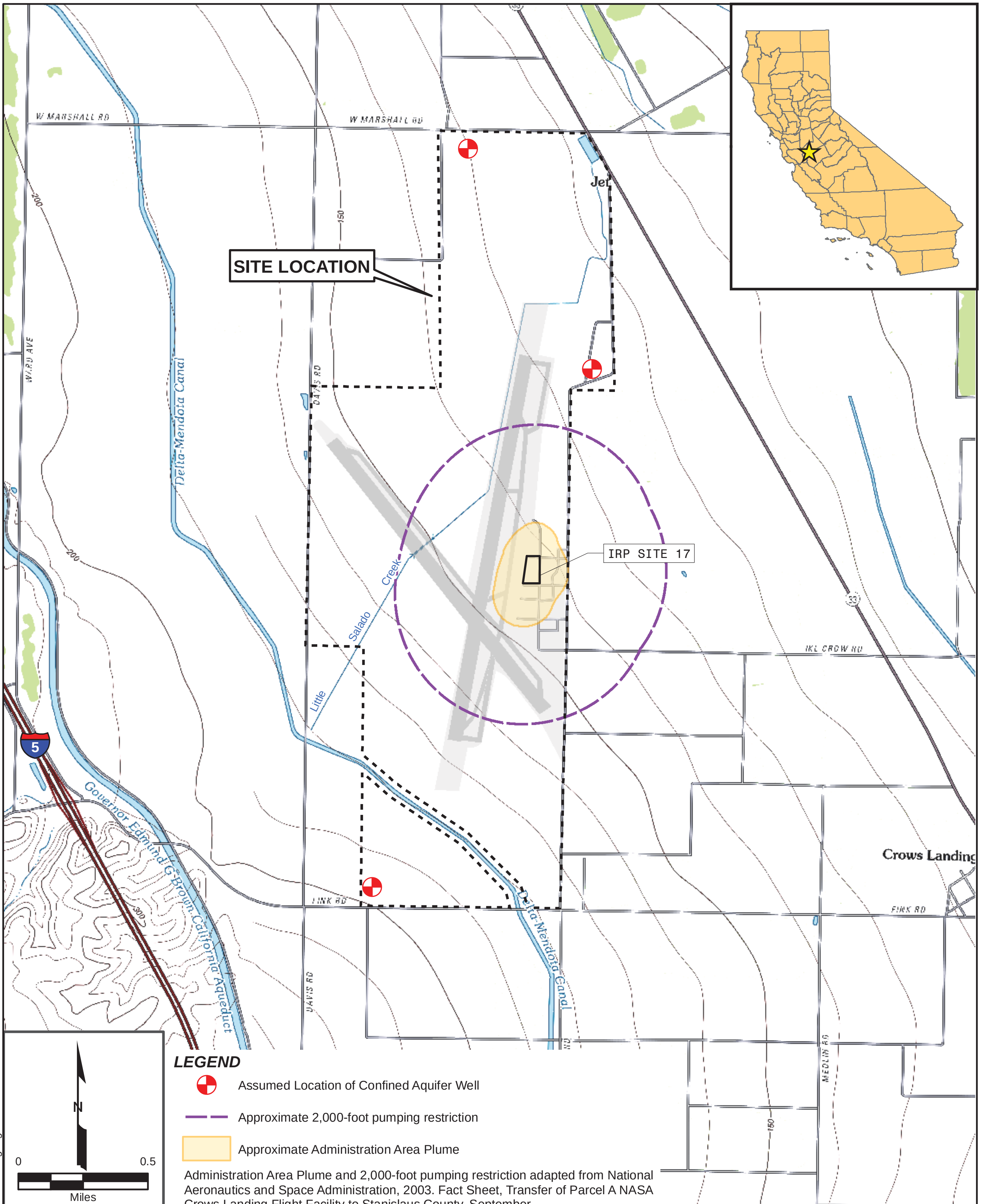
b. Significant and unreasonable reduction of groundwater storage.

c. Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.

d. Significant and unreasonable land subsidence that substantially interferes with surface land uses.

e. Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

Prior to issuing a permit to construct a new groundwater supply well, the County must review information provided by the applicant and make a determination whether it constitutes substantial evidence that the proposed groundwater extraction will not cause or contribute to one or more of the above undesirable results. To that end, it should be noted that the undesirable results listed above are aligned with questions contained in Appendix G of the State CEQA Guidelines, which are evaluated in Section 5.0 of this report. As such, this report fulfills the substantial evidence requirement for demonstrating compliance with the sustainable groundwater management requirements in the Stanislaus County Groundwater Ordinance.



LEGEND

Assumed Location of Confined Aquifer Well

Approximate 2,000-foot pumping restriction

Approximate Administration Area Plume

Administration Area Plume and 2,000-foot pumping restriction adapted from National Aeronautics and Space Administration, 2003. Fact Sheet, Transfer of Parcel A NASA Crows Landing Flight Facility to Stanislaus County. September

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 2-1-1 Site Location.mxd

JACOBSON | JAMES & associates, inc

TITLE: **SITE MAP**

DATE: 8/2/16

LOCATION: *CROWS LANDING INDUSTRIAL BUSINESS PARK STANISLAUS COUNTY, CALIFORNIA*

FIGURE: **2.1.1**

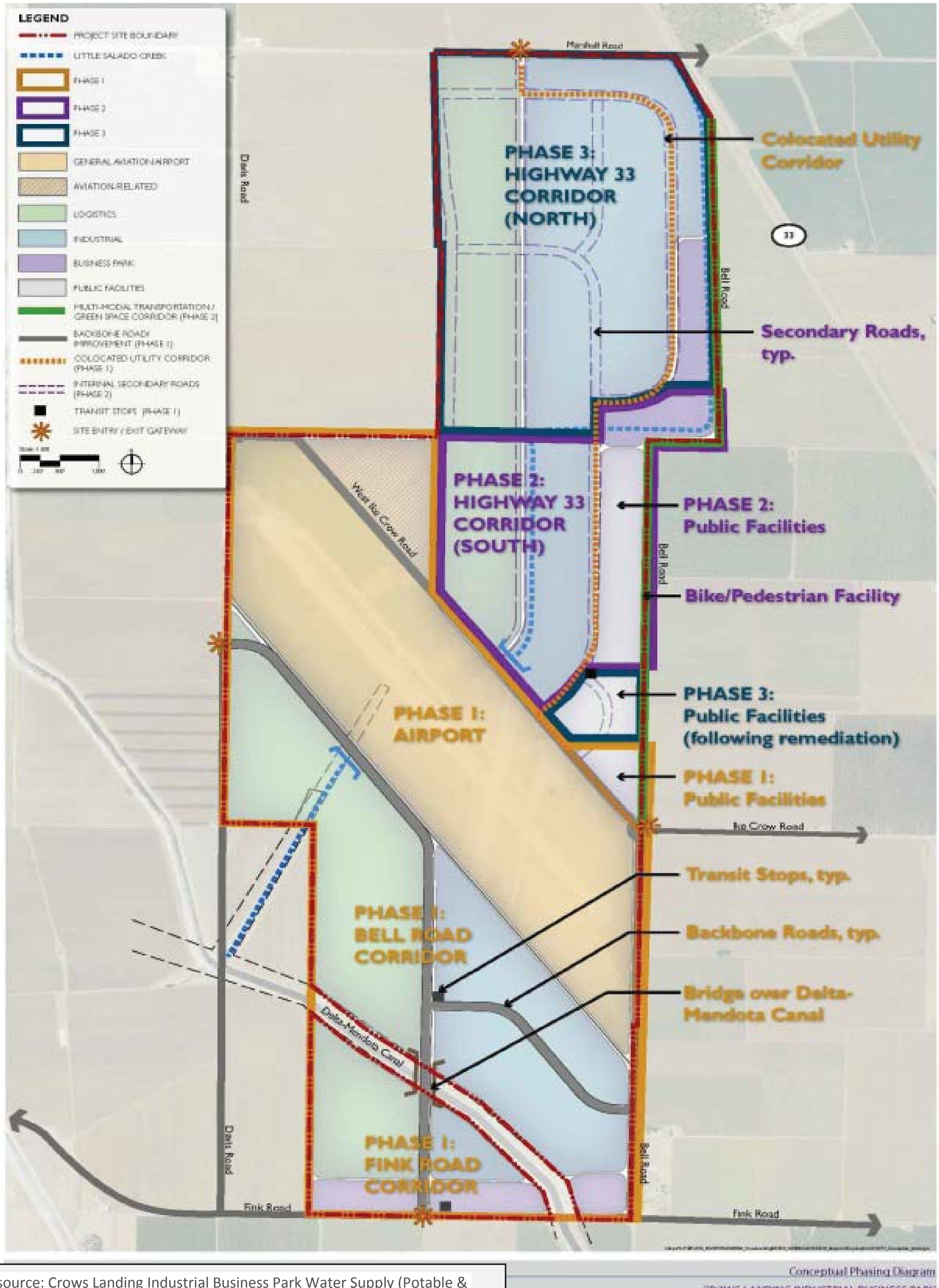


Figure source: Crows Landing Industrial Business Park Water Supply (Potable & Non-Potable Infrastructure and Facilities Study. AECOM and VVH Consulting Engineers, updated February 17, 2016.

JACOBSON | JAMES
& associates, inc

TITLE: **PROPOSED FACILITY LAYOUT**		DATE: 07/28/16
LOCATION: *Crows Landing Industrial Business Park Stanislaus County, California*		FIGURE: **2.1.2**

3.0 PROJECT SETTING

3.1 Existing Site Conditions and Topography

The Site is located in a predominantly agricultural area of rural Stanislaus County. It is located east of Interstate 5, west of State Route 33, south of the City of Patterson, and approximately 1 mile west of the unincorporated community of Crows Landing. It is bounded on the east by Bell Road, on the south by Fink Road, on the west by Davis Road, and on the north by Marshall Road and State Route 33. The Delta-Mendota Canal traverses the southern portion of the Site in a northwest/southeast direction. The Site is occupied by abandoned runways, taxiways, buildings and other facilities associated with the former Crows Landing airfield, surrounded by approximately 1,200 acres of cultivated agricultural land. Paved and unpaved access roads traverse the Site

Physiographically, the Site is located on the San Joaquin Valley floor, approximately 1 to 2 miles east of the Diablo Range, and 4 to 6 miles west of the San Joaquin River. The western margin of the valley consists of low hills and dissected alluvial fans at the foot of the Diablo Range. A short distance to the east, elevations drop off into alluvial and flood plains associated with the San Joaquin River. The Delta-Mendota Canal and California Aqueduct run along the western margin of the valley. The Site slopes gently to the northeast from a high elevation of approximately 180 feet above mean sea level (amsl) near the southwest Site corner to approximately 110 feet amsl near the intersection of State Route 33 and Marshall Road.

3.2 Climate

The area has a “Mediterranean” climate characterized by hot, dry summers and short, wet winters, and averages over 260 sunny days per year. The average annual precipitation at the Modesto meteorological station is just over 13 inches per year, with 88 percent of the precipitation occurring between November and April (Turlock Irrigation District, 2012; Sperling’s Best Places, 2016).

Much of California, including the Central Valley, has experienced unprecedented drought conditions over the last four years. As a result, water conservation measures have been mandated, delivery of surface water from the state and federal water systems has been curtailed, and reliance on groundwater resources for agricultural uses has increased.

3.3 Surface Hydrology

Drainage in the Site vicinity is generally toward the northeast, from streams draining the Diablo Range and along the natural slope of the valley floor toward the San Joaquin River. Drainage from the agricultural fields and airfield areas of the site is routed to Little Salado Creek, which traverses the Site in a northeasterly direction. Little Salado Creek is an ephemeral stream that drains the eastern slope of the Diablo Range, and discharges to Marshall Drain near the northeast corner of the Site. Marshall Drain transitions to an underground pipe near the intersection of Marshall Road and State Route 33. The average annual discharge on Little Salado Creek is estimated to be approximately 874 AFY (AECOM and VVH Consulting Engineers, 2016).

The dissected alluvial terrace deposits west of the Site at the base of the coast range generally do not contain shallow groundwater; however, due to their coarse grained nature, they are considered potentially important for groundwater recharge. When sufficient runoff occurs, it eventually drains to the San Joaquin River, approximately 4 to 6 miles east of the Site.

3.4 Hydrogeology

The Site is located in the Delta-Mendota Groundwater Subbasin (DMGS) of the San Joaquin Valley Groundwater Basin. Within Stanislaus County, the DMGS is bounded to the east by the San Joaquin River and to the west by low-permeability bedrock of the Coast Ranges that is associated with Tertiary and older marine formations. The subbasin extends southward from the northern boundary of Stanislaus County along the west side of San Joaquin Valley for approximately 80 miles, and crosses a total of four counties, encompassing an area of approximately 747,000 acres. The total estimate storage capacity of the DMGS is 30,400,000 acre feet to a depth of 300 feet, and 81,800,000 acre feet to the base of fresh groundwater (California Department of Water Resources [DWR], 2006).

Groundwater in the DMGS occurs in the Tulare Formation and overlying Quaternary and Holocene alluvium, terrace deposits and flood basin deposits. The Tulare Formation extends to a depth of over 1,000 feet, and includes beds, lenses, and tongues of clay, sand, and gravel that have been alternately deposited in oxidizing and reducing environments. It also includes a number of lacustrine clay units (DWR, 2013), the most prominent of which is known as the Corcoran Clay and acts as a regional aquitard that divides the basin fresh water deposits into an upper aquifer system that is unconfined to semi-confined, and a lower aquifer system that is confined (DWR, 2013). The Corcoran Clay is reported to occur at depths between approximately 200 and 250 feet near the Project Site, and extends from near the western margin of the subbasin to beneath the San Joaquin River. Groundwater production wells are completed in both the unconfined and confined aquifer systems; however, most high-capacity wells extend into the confined aquifer system. Domestic wells in the area are generally completed in the unconfined aquifer system.

As of 2006 (before the current drought), urban and agricultural groundwater extraction was estimated to be 508,000 AFY for the DMGS (DWR, 2006). An operational yield study by the City of Patterson estimated that the city could pump up to 12,000 AFY without significantly impacting the use of groundwater resources in the area surrounding Patterson's sphere of influence (RMC, 2016). The City of Newman pumped approximately 4,200 acre-feet of water in 2012 (Kenneth D. Schmidt and Associates [KDSA], 2013).

3.4.1 Groundwater Levels and Flow

The freshwater aquifers that are important to this study comprise approximately the upper 950 feet of sediments in this area. Groundwater levels are reported to range from approximately 30 to 50 feet bgs, and groundwater flow is generally toward the northeast, toward the San Joaquin River (DWR, 2016b). The reach of the San Joaquin River near the Site is hydraulically connected to the local shallow aquifer system

(State Water Resources Control Board [SWRCB], 2015); however, based on the depth to groundwater near the Site, it is unlikely that surface water resources and groundwater-dependent ecosystems (GDEs) in this area are connected to a regional groundwater table.

Groundwater elevation contour maps for the confined aquifer in the Site vicinity from 2011 to spring 2016 are provided as Appendix B. The contour maps show a groundwater ridge or mound persists opposite Little Salado, Salado, and Orestimba Creeks, which suggests recharge occurs along the mountain front. The contour maps show that in recent years, cones of depression have formed northwest and south of the Site, and locally influence the groundwater flow direction. The cones of depression appear most pronounced in the groundwater elevation contour maps from 2014 through 2016, particularly in the fall. This timing coincides with reductions of Central Valley Project (CVP) and State Water Project (SWP) surface water deliveries to local water providers in response to historic drought conditions (see Table 3.4.2). The cone of depression to the south is located northwest of Newman, near the northern portion of the Eastin Water District, which derives its water supply entirely from groundwater. A trend toward conversion of crop land to orchards in this area, as well as surrounding areas served by Del Puerto Water District (DPWD), was observed based on review of aerial imagery from the last 10 years (Google Earth, 2016). As such, this cone of depression may relate to an increase in pumping from the confined aquifer in response to increasing demand as the orchards matured, coupled with hardened demand that was not met from surface water deliveries.

The cone of depression to the northwest of the Site is consistent with reported groundwater pumping from the confined aquifer northwest of Patterson for irrigation purposes. Hydrogeologic conditions in this area are described in a report for the Arambel Business Park (KDSA, 2013). Groundwater pumping for irrigation from confined aquifer wells northwest of Patterson reportedly influence the groundwater flow direction (i.e., create drawdown in the confined aquifer). Most recharge in this area is associated with CVP surface water deliveries, as recharge from west side streams and rainfall is generally small. In 2010, more than half of the water applied for irrigation in this vicinity was from surface water deliveries, with the rest of the demand met from groundwater pumping. Curtailment of surface water deliveries in recent years due to drought conditions may have led to increased pumping from the confined aquifer to meet agricultural demand, while reducing a significant source of groundwater recharge. These conditions may explain the cone of depression observed northwest of the Site.

Groundwater hydrographs for several wells near the Site that are reported or assumed to be screened within the confined aquifer and for which long term hydrographs were retrieved from the DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) website and are shown on Figure 3.4.1 (DWR, 2016d). Analysis of long terms hydrographs in the region south of the Site indicates that groundwater levels in the area were generally lowest in the 1940's and 1950's, increased during the 1960's and 1970's when surface water became available from the state and federal water projects, and decreased through the 1990's and 2000's, when surface water deliveries began to be curtailed for environmental reasons. Shorter term trends were identified related to periods of above or below normal precipitation. The two wells located south of the Site, near the cone of depression northwest of Newman, show a recent decreasing trend that may relate to current drought conditions and increased groundwater pumping to replace curtailment of surface water deliveries. It is noteworthy that current groundwater levels in the well with the longest period of record (State Well No. 06S08E29J001M) are approximately 40 feet above their historical low level in October 1952. Groundwater levels in State Well No.'s 07S08D14D001M and 06S08E34M001M are at their historical low levels; however, water level data are not available for these wells prior to October 1958 and March 1959, respectively, and prior water levels could have been lower.

The hydrographs for State Well No.'s 06S08E20D002M and 06S08E09E001M span the period from 2011 to the present. In general, these hydrographs suggest that groundwater levels near the Site recovery quickly after pumping ceases, as evidenced by relatively consistent water elevations by season (see State Well No. 06S08E09E001M on Figure 3.4.1). Water levels near the Site have overall been stable over the period of record (since 2011), which indicates recent pumping rates near the Site have been sustainable on an annual basis, even during the drought.

3.4.2 Aquifer Properties

DWR has estimated the average specific yield of the water-bearing sediments in the DMGS as 11.8 percent (DWR, 2006). The permeability of the shallow groundwater-bearing strata in the Site vicinity is reported by local drillers to be variable (Ward, personal communication, 2016). The rancher that currently farms the land at the Site uses three production wells (Wheeler, personal communication, 2016). Two of these wells are completed in the shallow aquifer system overlying the Corcoran Clay, to a depth of approximately 210 feet bgs. One of these shallow wells has not been a reliable groundwater producer, and the yield from this well has reportedly decreased over time. When it was originally rehabilitated by the current user and placed back into service, it reportedly produced groundwater at a rate of approximately 900 gallons per minute (gpm) at the beginning of the irrigation season, decreasing to approximately 450 gpm by the end of the irrigation season. However, the yield from this well has reportedly decreased from year to year, and in 2015, this well reportedly did not produce a significant amount of groundwater. The second shallow well is reliably pumped continually throughout the irrigation season; however, the well yield typically decreases from approximately 1,400 gpm at the beginning of the season to approximately 400 gpm at the end of the season. The third existing well at the Site is completed to a depth of approximately 495 feet bgs, with two screened intervals. This well has consistently produced groundwater at a rate of approximately 900 gpm throughout the irrigation season, suggesting that most or all of the groundwater pumped from this well is derived from the confined aquifer below the Corcoran Clay. The rancher that currently farms the land indicated that the water quality from this well is distinct from the other two shallow wells, and contains more boron. This observation would be consistent with most of the water from this well coming from the confined aquifer.

Estimated transmissivities are available for seven wells near Patterson to the north of the Site, and seven wells near Newman, southwest of the Site (KDSA, 2010 and 2013). These 14 wells are reportedly screened entire within the confined aquifer, or in the confined and shallow aquifer ("composite" wells). In addition, specific capacity tests for two nearby confined aquifer wells were evaluated by Stanislaus County

Department of Environmental Resources and the results provided to JJ&A. An evaluation of aquifer parameters based on these tests is presented in Table 3.4.1. The estimated hydraulic conductivity for the confined and composite aquifers ranged from 13 to 117 feet per day (ft/day), with a geometric mean of 45 ft/day and a 10th percentile value of 17 ft/ day. By comparison, results from a 72-hour pumping test Patterson City Well No. 7 yielded an average hydraulic conductivity for the confined aquifer of 40 feet/day (KDSA, 2013).

The vertical hydraulic conductivity of the Corcoran Clay near the site is not known, but a reasonable range based on the literature is approximately 6.2 E-04 to 3.0 E-06 ft/day (USGS, 2009; USGS, 2004).

The storativity of the confined aquifer from the Patterson City Well No. 7 pumping test was 0.0003 (KDSA, 2013). This is similar to the results of a pumping test conducted by Kleinfelder at a similar location approximately 12 miles to the north, which was 0.0001 (Kleinfelder, 2016).

Table 3.4.1 Aquifer Properties Estimated from Specific Capacity Tests

Well	Screen Aquifer	Screen Interval Span (feet)	Reported Specific Capacity (gpm/ft)	Estimated Transmissivity (gpd/ft^2)	Estimated K for Screen Interval Span (ft/day)
Patterson City Well 2	Composite	190	42	71,400	50
Patterson City Well 4	Composite	225	19	32,300	19
Patterson City Well 5	Confined	175	42	84,000	64
Patterson City Well 6	Composite	130	15	25,500	26
Patterson City Well 7	Confined	267	21	42,000	21
Patterson City Well 8	Confined	140	59	118,000	113
Patterson City Well 11	Confined	220	45	90,000	55
Newman City Well 2	Composite	247	77	130,900	71
Newman City Well 3	Composite	270	65.1	110,670	55
Newman City Well 4	Composite	322	77.8	132,260	55
Newman City Well 13	Composite	315	92.1	156,570	66
Newman City Well 36	Composite	303	32.9	55,930	25
Newman City Well 42	Composite	301	64.2	109,140	48
Newman City Well 53	Composite	300	51.3	87,210	39
6S/8E-6Q (WCR#788583)	Confined	180	20.9	41,800	31
6S/8E-21R(WCR#82200)	Confined	190	9.4	18,800	13

3.4.3 Groundwater Quality

Generally, groundwater quality in the basin is suitable for most urban and agricultural uses, with primary constituents of concern consisting of total dissolved solids (TDS), nitrate, boron, chloride, and organic compounds (DWR, 2003). Areas of high TDS concentrations are primarily found in the western region of the valley, due to the recharge of streamflow originating from the marine sediments in the nearby Coast

Ranges, while high concentrations of boron are typically found in the valley trough as the results of salts, due to evaporation and poor drainage (DWR, 2003). Sulfate and boron concentrations vary in both the shallow and confined aquifers, with slightly higher boron concentrations in the confined aquifer; there is little difference in arsenic concentrations between the shallow and confined aquifers. Nitrate, nitrite, hexavalent chromium, and 1,2,3-trichloropropane have been detected at concentrations above the Maximum Contaminant Levels (MCL) in groundwater from the Crows Landing Community Services District area surrounding the Site (AECOM and VVH Consulting Engineers, 2016).

The Navy maintains a 2,000 foot pumping restriction at the Crows Landing Air Facility around a contamination plume known as the IRP Site 17 Administration Area Plume (see Figure 2.1.1) (AECOM and VVH Consulting Engineers, 2016). The contamination plume is the result of underground fuel storage tanks, used for the former facility, and includes benzene and other volatile organic compounds. The plume contaminants appear to be limited to the shallow aquifer, above the Corcoran Clay.

3.4.4 Groundwater Budget and Existing Groundwater Demand

Development of a complete groundwater budget and demand inventory is beyond the scope of this study; however, the following information is pertinent to this analysis. DWR has listed the DMGS as being in a state of overdraft, though groundwater levels in the vicinity of the Site are generally stable (Section 3.4.1). A study of groundwater level trends from 1993 to 2008 found that groundwater levels in northern portions of the DMGS were generally hydrologically balanced (AECOM, 2011). The study found minimal apparent net change in groundwater elevations, which were interpreted as equilibrium between use and recharge. However, consistent declines in groundwater levels in certain localized areas (including an area west of Newman), may be indicative of a developing local overdraft condition. This is consistent with groundwater elevation contours and hydrographs for the Site vicinity, as discussed in Section 3.4.1.

Land use overlying the DMGS near the Site is primarily agricultural, with local agricultural water demand served by surface-water deliveries from DPWD, supplemented by groundwater extraction. Municipal water demand for the Cities of Patterson and Newman, as well as the community of Crows Landing, is met using groundwater. Demand forecasts are available for the City of Patterson from the 2015 update to its Urban Water Management Plan (UWMP) (RMC, 2016). The demand is projected to increase from 6,376 AFY in 2020 to 11,801 AFY in 2040. Similar proportional increases in demand may also be expected in the communities of Newman and Crows Landing if they follow similar population and development trends. However, it is important to note that increased municipal demand would be expected to be offset by a corresponding decrease in agricultural demand associated with conversion of agricultural land to municipal use.

Groundwater demand for agricultural production at the Site has historically been met through a combination of groundwater pumping and surface deliveries from DPWD. Information regarding the total applied water volumes and groundwater pumpage for on-Site wells for the last five years was provided by the rancher that farms the property and is summarized in Table 3.4.2, below.

Table 3.4.2 Historical Site Groundwater Pumpage and Surface Water Deliveries

Year	Volume of Groundwater Extracted (acre-feet) [1]			Volume of Surface Water Delivered (acre-feet) [2]	Percent of CVP Contract Allotment Available [2]	Total Applied Water (acre-feet)
	Deep Well	Shallow Wells	Total			
2012	380	560	940	1,629	40%	2,569
2013	402	448	850	424	20%	1,274
2014	390	212	602	158	0%	760
2015	564	378	942	0	0%	942
Average	434	400	834	553	15%	1,386

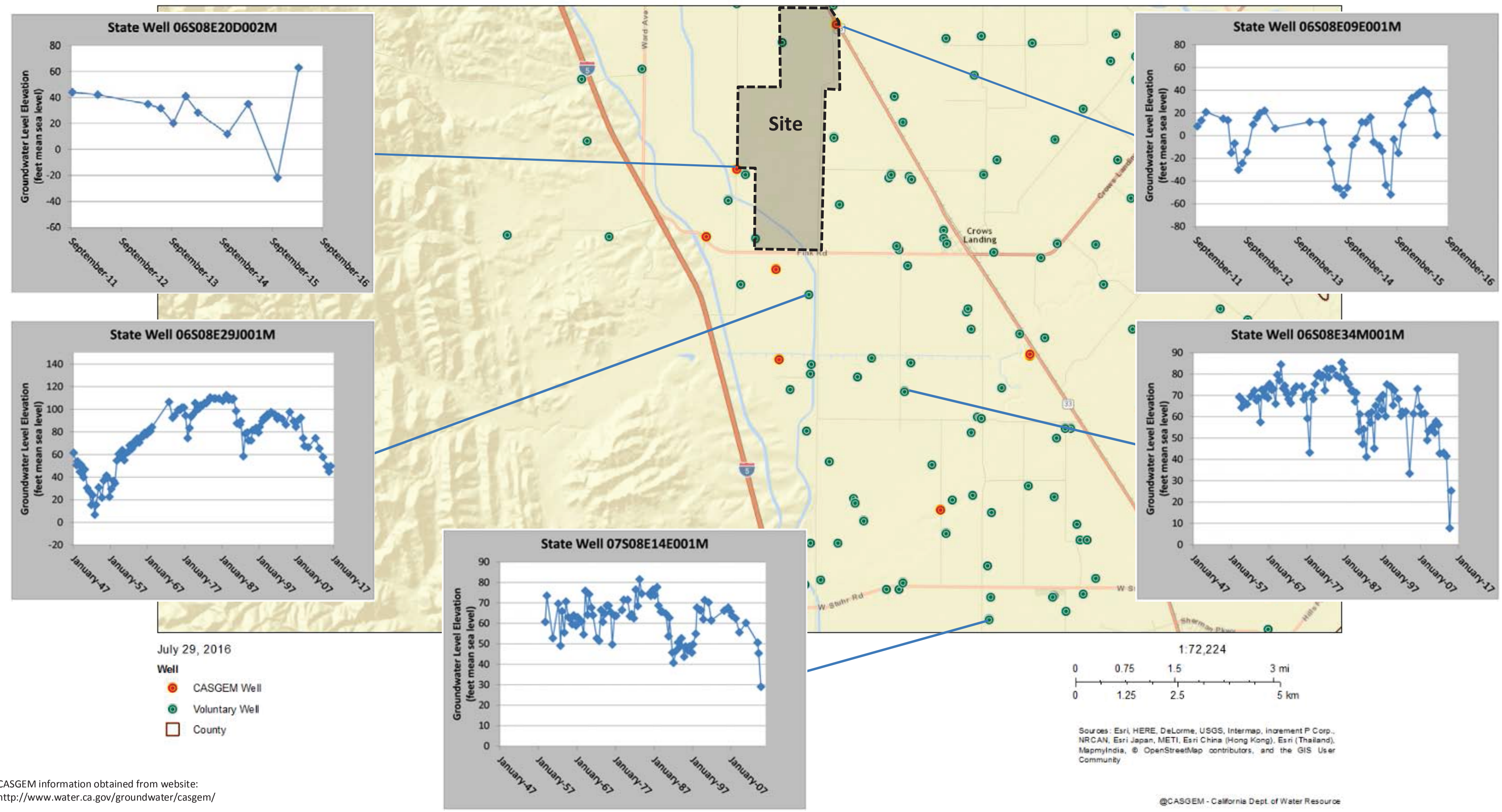
1. Based on information reported in AECOM, 2016 or data provided by Wheeler, 2016. Where confliciting data were provided, extraction volumes reported in AECOM, 2016 were utilized and divided among the wells in proportion to reported pumping rates.

2. Taken from Water Use Statements from Del Puerto Water District provided by Wheeler, 2016.

3.5 Subsidence

Land subsidence can occur when compressible clays are depressurized as a result of groundwater extraction, triggering water to flow from the clays into the surrounding aquifer, and ultimately consolidation of the clay under pressure from the overlying sediments. This can happen especially in confined aquifer conditions such as below the Corcoran Clay, where the head loss resulting from groundwater extraction is greater than in unconfined aquifers. The process of subsidence is reversible when granular aquifer materials compress and expand under changing pressure conditions, but irrecoverable when clay frameworks are compressed and reoriented. Irrecoverable subsidence results in decreased storage capacity within the aquifer. In general, most subsidence occurs when an aquifer is initially depressurized, but can continue for months, or even years, after clays slowly dewater and adjust to the new pressure regime. If groundwater levels subsequently recover, subsidence generally does not resume (or does not progress as rapidly), until groundwater levels fall below historical low levels.

DWR has included the DMGS on the list of critically overdrafted basins, largely due to overdraft and subsidence reported outside Stanislaus County to the south (DWR, 2016a); nevertheless DWR has designated the entire DMGS as having a high potential for future subsidence (DWR, 2016b). The Bureau of Reclamation, in cooperation with DWR, monitors a geodetic survey network of triangulated elevation monitoring of benchmarks in the area surrounding the San Joaquin River from Fresno to Patterson, including locations along the Delta-Mendota Canal (U.S. Bureau of Reclamation [USBOR], 2014). Survey data from this program indicate a subsidence rate of 0 to 0.15 feet (0 to 1.8 inches) per year from December 2011 to December 2015 near the Site, including areas surrounding Patterson and Newman (USBOR, 2016). More rapid short-term subsidence rates were reported from December 2012 through December 2013, ranging from 0.15 to 0.3 feet per year (USBOR, 2014). This is generally consistent with DWR's report of 1 to 2.5 inches of subsidence from 2005 to the present at continuous survey station P259, located near the northeast corner of the Site at the intersection of Marshall Road and State Highway 33 (DWR, 2016b).



CASGEM information obtained from website:
http://www.water.ca.gov/groundwater/casgem/

JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	JH	MT

FIGURE 3.4.1

Hydrographs for Confined Aquifer Wells Located Near the Site

4.0 EVALUATION OF HYDROGEOLOGIC EFFECTS

To evaluate the potential effects of the CLIBP on groundwater resources, an analytical groundwater modeling study was performed to assess the potential impacts of pumping on groundwater levels at the Site and in the surrounding area under a range of scenarios that bracket the current uncertainty regarding aquifer conditions. The analytical modeling study was based on the conceptual understanding described in Section 4.1, and implemented as described in Section 4.2. The results are presented in Section 4.3.

4.1 Conceptual Understanding

The modeling study is based on the following working conceptual understanding of groundwater occurrence and flow in the vicinity of the Site:

- Bedrock of the Diablo Range, located approximately 1 to 2 miles west of the Site, forms a no-flow boundary for the alluvial aquifers underlying the DMGS.
- In the Site area, groundwater occurs in a two-aquifer system, including an upper unconfined aquifer and a lower confined aquifer. These two aquifers are separated by the Corcoran Clay, a regionally extensive aquitard that occurs at a depth of approximately 250 feet bgs, with an average thickness of approximately 70 feet, based on data provided by Stanislaus County.
- The base of freshwater aquifers in this area is reported to occur at an elevation of approximately 800 feet below sea level (approximately 950 feet bgs) (Page, 1973). The confined aquifer system available for development by the CLIBP is therefore assumed to extend from approximately 320 to 870 feet bgs, for a total thickness of approximately 550 feet.
- Mountain front recharge occurs near the western edge of the subbasin, where streams draining the Diablo Range emerge onto small alluvial fans at the edge of the valley. The Corcoran Clay may be absent or discontinuous in this area (AECOM, 2011), so it is possible that some recharge percolates directly into the confined aquifer in this area.
- Regional groundwater flow is toward the northeast, away from the Diablo Range and toward the San Joaquin River, approximately 4 to 6 miles east of the Site (see Appendix B). This flow pattern has been locally disrupted by cones of depression located north and south of Site vicinity, which have expanded since 2013 during drought conditions.
- In the vicinity of the Site, groundwater levels have consistently recovered each year after the irrigation season, and a recurrent groundwater mound at the mountain front near Little Salado Creek and Salado Creek suggests a persistent inflow of recharge from this area restores groundwater levels and the prevalent flow direction in this area (see Figure 3.4.1 and Appendix B). This suggests that groundwater recharge and discharge are generally balanced in this area.
- Groundwater levels along the mountain front west of the Site are reported to be approximately 110 feet bgs near Crow Creek (southwest of the Site), and decreasing to approximately 30 feet bgs near

Del Puerto Creek (northwest of the Site),where a cone of depression appears to have formed during recent drought years (see Appendix B).

- Groundwater levels near the San Joaquin River are generally close to the elevation of the river, suggesting that this reach of the river is hydraulically connected with the shallow aquifer. Groundwater contours near the river suggest that shallow groundwater is discharging to the river, especially in the area to the southeast of the Site.
- Transmissivity data from municipal wells in Patterson and Newman that are screened within the confined aquifer indicate the lateral hydraulic conductivity ranges from 19 to 113 ft/day (see Table 3.4.1). Hydraulic conductivity calculations based on these data indicate a mean of 47 ft/day, a geometric mean of 41 ft/day, and a 10th percentile of 17 ft/day. The hydraulic conductivity is assumed to be the same in the shallow and confined aquifers.
- Pumping test data from Patterson City Well No. 7 and an irrigation well located in a similar setting approximately 12 miles to the north indicate the storativity of the confined aquifer ranges from 0.0001 (Kleinfelder, 2016) to 0.0003 (KDSA, 2013). The storativity in the Corcoran Clay is assumed to be the same as for the confined aquifer. The storativity in the shallow aquifer near the Site is not known, but a reasonable value based on our experience is approximately 0.04.
- DWR (2006) estimated the specific yield for the DMGS to be 11.8; this value was used for the shallow and confined aquifers.
- The vertical hydraulic conductivity of the Corcoran Clay near the site is not known, but a reasonable range based on the literature is approximately 1.0 E-04 to 3.0 E-06 ft/day (USGS 2004 and 2009).

4.2 Analytical Drawdown Model

4.2.1 Approach

An analytical model was constructed to evaluate the reasonable range of drawdown that could occur from groundwater extraction related to development of the CLIBP. The model was constructed using the AnAqSim modeling code (Fitts Geosolutions, 2016), a three-dimensional (multi-layer) analytical element modeling code capable of simulating groundwater flow to wells under confined, unconfined, or semi-confined aquifer conditions. AnAqSim is able to simulate a variety of boundary conditions (e.g., no-flow, constant flux, variable flux, general head, and constant head), line or area sources and sinks (e.g., rivers and recharge), and flow barriers. AnAqSim can be used to simulate transient conditions as a result of pumping from single or multiple wells at constant or varying rates, and calculates the head and discharge as functions of location and time across a designated model grid or at designated points.

Four modeling scenarios were developed using a superposition approach to simulate drawdown under a reasonable range of conditions. Superposition or impact modeling is a robust modeling approach which focuses on evaluation of drawdown as opposed to actual hydraulic head, and allows the modeler to focus more on the evaluation of the changes introduced by a project, rather than the simulation of past or future groundwater levels (Reilly, Franke and Bennett, 1987). The use of superposition modeling in hydrogeologic literature is well established and this approach has been widely used to evaluate the impacts of water supply pumping.

For each of the modeling scenarios, a baseline model was constructed to simulate a set of aquifer conditions representing reasonable end point assumptions. The model was then run in transient mode with simulated pumping from the project wells, and resulting water level surface was subtracted from the baseline to evaluate the drawdown induced by the project at the end of Phase 1, Phase 2 and Phase 3 of the Project. The model inputs and supporting rationale are discussed below and summarized in Table 4.2.1. The model domain and boundaries are shown graphically in Figure 4.2.1, and model layering is shown in Figure 4.2.2.

Model Domain and Layering. For this evaluation, a model domain was established that measures approximately 75,000 by 50,000 feet that is approximately centered on the Site. The model domain was divided into two subdomains. The eastern subdomain includes three layers representing the shallow unconfined aquifer, the Corcoran Clay, and the lower confined aquifer. The western subdomain consists of a narrow strip on the west side of the model domain (the "forebay"), which was constructed as a single layer separated from the rest of the model domain by an inter-domain boundary; the forebay represents mountain-front sediments where the Corcoran Clay may or may not be present as a confining layer. The San Joaquin River was incorporated into the model with a direct connection to the shallow aquifer subdomain. Spatially-variable area sink/source polygons were constructed to model groundwater recharge around the San Joaquin River and groundwater extraction from the three assumed new confined aquifer wells at the CLIBP. This approach was selected because the software and domain configuration allow for modeling of drawdown in any of the subdomains (the focus is on the confined aquifer) at different phases of Project buildout with the ability to vary aquifer characteristics and boundary conditions that bracket the current uncertainty regarding aquifer conditions.

Boundary Conditions. General head boundaries were simulated on north, east, and south the east sides of the model domain. General head conditions were selected based on groundwater elevations from contour maps for the project vicinity (Appendix B). The western boundary of the model domain was simulated in two different ways to bracket the current uncertainty regarding the persistence of the Corcoran Clay in this area (see Figure 4.2.2):

- In Scenarios 1 and 2, the western boundary of the forebay was defined as a no-flow boundary along the mountain front, with surface recharge to the forebay. For these scenarios, the forebay subdomain was extended to a depth of 300 feet bgs, and water was allowed to flow laterally directly from the forebay into the Corcoran Clay and the lower confined aquifer (direct recharge condition).
- In Scenarios 3 and 4, the western boundary of the forebay was defined as a constant head boundary, with the assigned heads based on average historical groundwater elevations along the western margin of the basin over the last five years (Appendix B). For these scenarios, the depth of the forebay subdomain was identical to the shallow aquifer depth, and lateral groundwater flow was allowed from the forebay only into the shallow aquifer. Under these scenarios, the only path

by which mountain front recharge may enter the lower confined aquifer is via percolation through the Corcoran Clay (no direct recharge condition).

Line Sinks. The San Joaquin River was simulated as a line sink with direct connection to the shallow aquifer. The river stage was set based data from USGS gaging stations "SMN" (San Joaquin River above the Merced River near Newman) and SCL (San Joaquin River near Crows Landing) (DWR, 2016c).

Aquifer Characteristics. The aquifer was modeled as a 3-layer domain with the Corcoran Clay as a leaky confining layer. Aquifer transmissivity and storativity, and confining layer vertical hydraulic conductivity, were assigned a reasonable range of values based on the information discussed in Section 3, as summarized in Table 4.2.1, below. Assigned values for horizontal hydraulic conductivity ranged from a maximum of 40 ft/day (the value derived from the City of Patterson pumping test) to 17 ft/day (the 10th percentile hydraulic conductivity derived from the analysis of specific capacity data presented in Table 3.4.1).

Pumping. Pumping was simulated to occur from three wells installed as shown on Figure 4.2.1. Pumping was assumed to be equally distributed among the three wells. Pumping was modeled to occur only in the confined aquifer over a thickness of 550 feet, encompassing the sediments extending vertically from the base of the Corcoran Clay to approximately 80 feet above the reported base of fresh water. The total pumping for each project development phase was based upon the net increase in potable groundwater demand at the end of each buildout phase, compared with the pre-development condition, as summarized in Table 4.2.1, below.

Table 4.2.1 Analytical Model Input Parameters

Model Input Parameter		Input Data Value				Data Source
		Shallow Aquifer	Corcoran Clay	Confined Aquifer	Forebay	
Aquifer Thickness (feet)		250	70	550	250 to 400	Section 3.4
Storativity		0.04	0.0001 to 0.0003	0.0001 to 0.0003	0.004	Section 3.4.2
Specific Yield		11.8	0.0001 to 0.0003	11.8	11.8	Section 3.4.2
Hydraulic Conductivity, Horizontal (ft/day)		17 to 40	0.0003 to 0.001	17 to 40	17 to 40	Table 3.2.1
Hydraulic Conductivity, Vertical (ft/day)		1	0.000003 to 0.0001	1	1	Fetter, 1994
Net Pumping Rate (AFY)	Phase 1 (2017 to 2026)	0	0	739	NA	Table 2.2.1
	Phase 2 (2027 to 2036)	0	0	1,036	NA	Table 2.2.1
	Phase 3 (2037 to 2046)	0	0	1,496	NA	Table 2.2.1

4.2.2 Model Inputs

The analytic element model's input parameters are summarized in the Table 4.2.1 above. The model assumes all pumping is from the confined aquifer to meet the increased demand for potable water, and that there is no net increase in groundwater demand from the shallow aquifer.

4.2.3 Model Scenarios

As with any predictive modeling study, uncertainty in the model inputs will affect the reliability of the results. Therefore, four modeling scenarios were developed in order to address a reasonable range of possible outcomes, thus bracketing the likely effects of the Project. These scenarios are described in Table 4.2.2, below. For each scenario, drawdown is evaluated at the full buildout of each construction phase (i.e., after 10, 20, and 30 years).

4.2.2 Analytical Modeling Scenarios

Parameter	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Direct Recharge to Confined Aquifer from Forebay	✓	✓		
No Direct Recharge to Confined Aquifer from Forebay			✓	✓
Best Case Aquifer Parameters[1]	✓		✓	
Worst Case Aquifer Parameters[2]		✓		✓

[1] Confined aquifer storativity of 0.0003 and horizontal hydraulic conductivity of 40 ft/day; Corcoran Clay storativity and specific yield of 0.0003, horizontal hydraulic conductivity of 0.001 ft/day, and vertical hydraulic conductivity of 0.0001 ft/day.

[2] Confined aquifer storativity of 0.0001 and horizontal hydraulic conductivity of 17 ft/day; Corcoran Clay storativity of 0.0001, specific yield of 0.000003, horizontal hydraulic conductivity of 0.0003 ft/day, and vertical hydraulic conductivity of 0.000003 ft/day.

4.2.4 Assumptions and Limitations

This section presents hydrogeologic assumptions that are incorporated in the analytical element model.

- The aquifer layers have a uniform lateral and vertical hydraulic conductivities, and uniform specific yield and storativity. This is a typical simplifying assumption inherent in many models, and is appropriate as long as the objective is to model the general distribution of impacts under average conditions.
- The potentiometric surface is approximated through the use of boundary conditions and is not calibrated. This is simplifying assumption used in many models that are designed to evaluate drawdown relative to a baseline condition using a superposition approach. The inherent limitation in this approach is that the model cannot be used to predict actual groundwater level elevations. In

addition, the modeled drawdown may be considered an approximation. The impact of these limitations is lessened through the use of range of boundary and aquifer conditions.

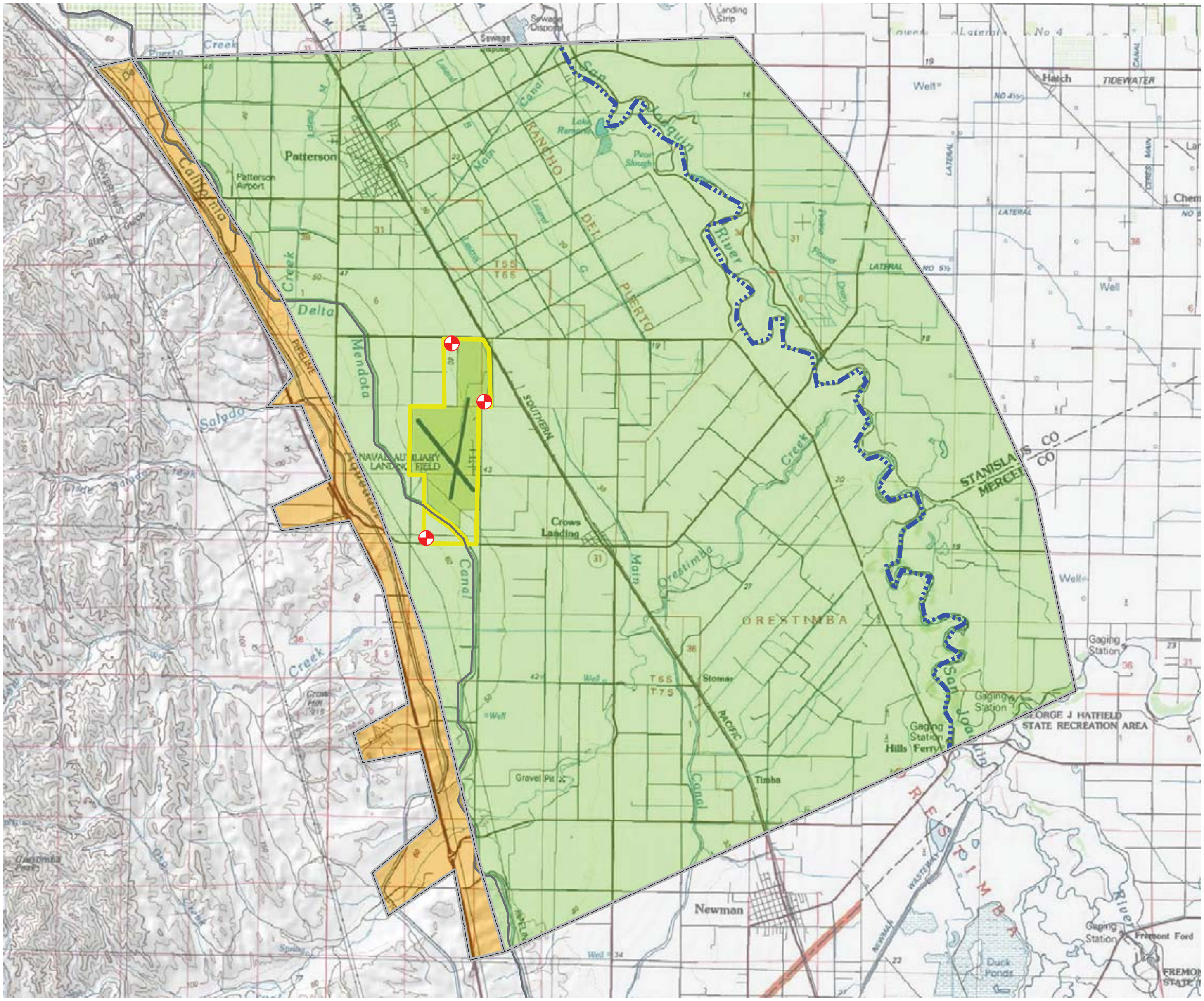
- Water is released from storage in the aquifers instantaneously, the pumping well is screened in, and receives water from, the full thickness of the aquifer, and the well is 100 percent efficient.
- Areal recharge and pumping discharge (with exception of the Project) are assumed to be balanced and are therefore neglected in the simulation. This assumption is supported by the generally stable groundwater levels in the Site vicinity.
- Mountain front recharge, underflow in, underflow out, and river discharge are balanced and simulated using boundary conditions, line sinks and areal flux in the forebay subdomain.

4.3 Results

The distribution of drawdown predicted for each of the four scenarios is shown at the buildout of Project Phase 1, 2 and 3 on Figures 4.3.1, 4.3.2, and 4.3.3, respectively, and key findings are summarized in Table 4.3.1. Predicted drawdown in the confined aquifer is greatest under Scenario 4 and least under Scenario 1. Predicted drawdown is more sensitive to the modeled difference in aquifer parameters than to the different recharge conditions that were evaluated. Key findings from the predictive modeling are summarized below:

- Drawdown is predicted to stabilize quickly for each stress period, generally within a year.
- The maximum predicted drawdown in the confined aquifer ranges from:
  - 2 feet (best case) to 7 feet (worst case) at completion of Phase 1 buildout;
  - 3 feet (best case) to 10 feet (worst case) at completion of Phase 2 buildout; and,
  - 4 feet (best case) to 14 feet (worst case) at completion of Phase 3 buildout
- The maximum predicted drawdown in the confined aquifer beneath the Delta-Mendota Canal ranges from:
  - 1 foot (best case) to 6 feet (worst case) at completion of Phase 1 buildout;
  - 2 feet (best case) to 9 feet (worst case) at completion of Phase 2 buildout; and,
  - 3 feet (best case) to 13 feet (worst case) at completion of Phase 3 buildout
- The predicted drawdown in the confined aquifer at completion of Phase 3 buildout ranges from 2 feet (best case) to 7 feet (worst case) near the city of Patterson and from approximately 1 foot (best case) to 4 feet (worst case) beneath the city of Newman. This suggests that drawdown related to Project pumping would contribute slightly to the cones of depression located near these cities. The depths of these cones of depression was approximately 50 to 60 feet below surrounding water level elevations in the fall of 2015 (Appendix B), and Project-related drawdown would add an additional 1 to 10 percent to this depth if the cones of depression persist until Phase 3 buildout. However, it is likely the cones of depression will recover at least partially during non-drought conditions.

- Predicted drawdown in the shallow aquifer from new pumping in the confined aquifer will be negligible.



LEGEND

- Assumed Location of Confined Aquifer Well
- Site location
- San Joaquin River Line Sink
- East Subdomain (Shallow Aquifer, Corcoran Clay and Confined Aquifer)
- West Subdomain (Forebay)

N

0 1.5
Miles

JACOBSON | JAMES
& associates, inc

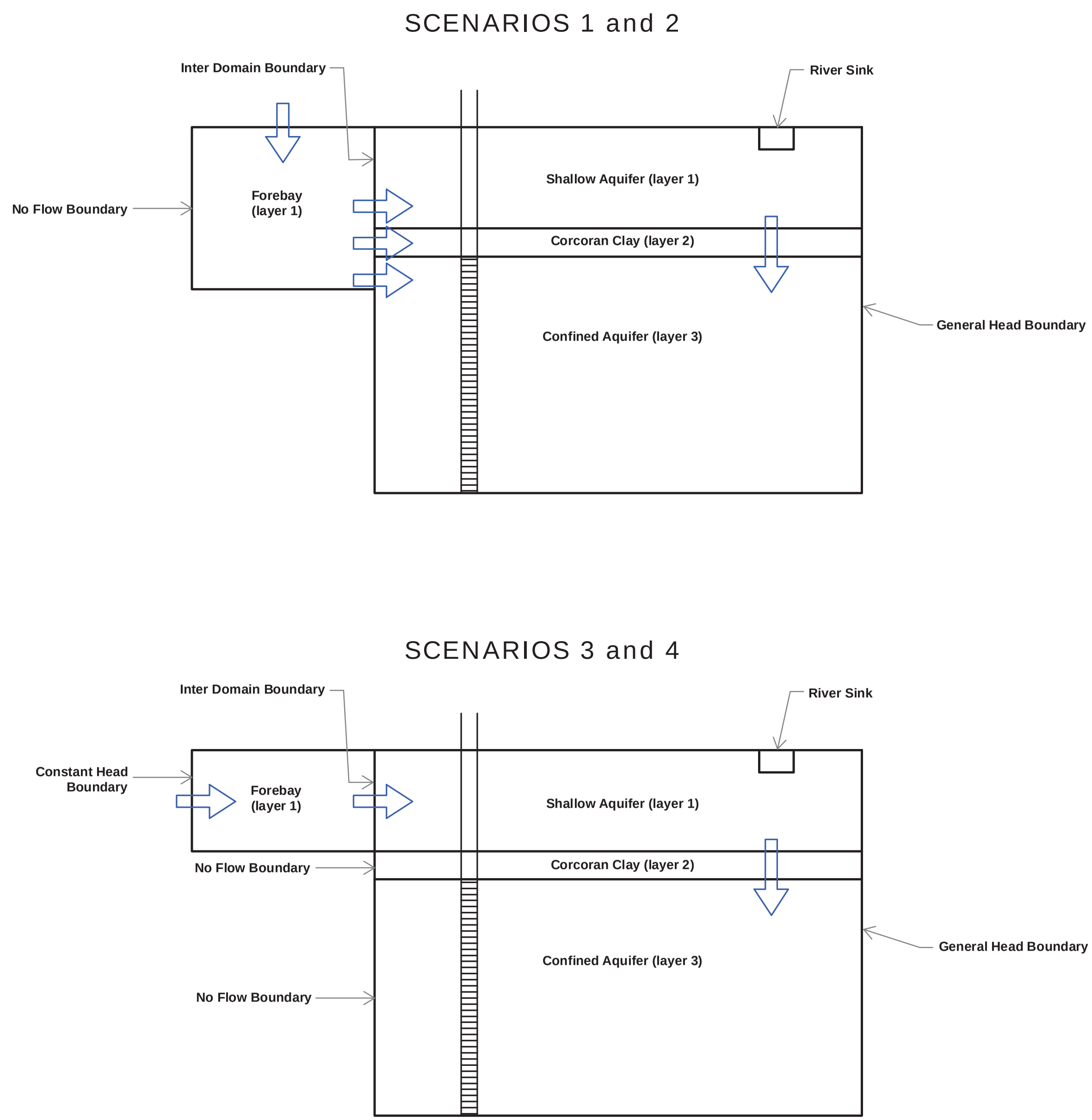
TITLE

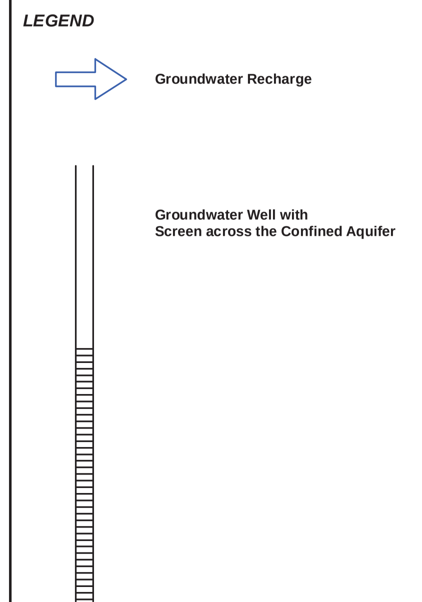
MODEL DOMAIN BOUNDARIES AND FEATURES

CROWS LANDING INDUSTRIAL BUSINESS PARK
STANISLAUS COUNTY, CALIFORNIA

DRAWN BY	APPROVED BY	DATE	FIGURE
DPG	JB	8/2/16	4.2.1

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 4-2-1 Model Domain and Features.mxd





JACOBSON | JAMES & associates, inc

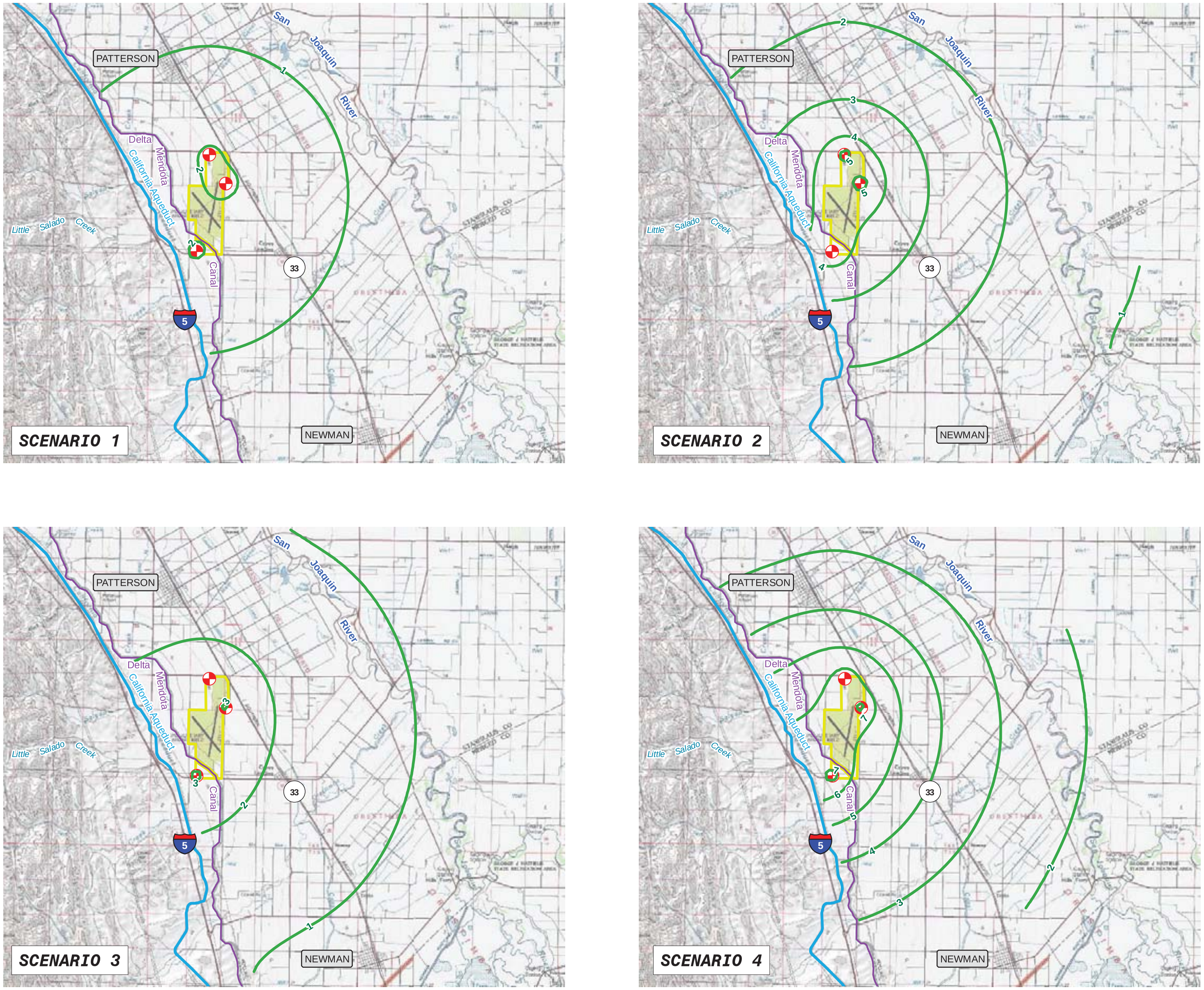
TITLE

CONCEPTUAL ILLUSTRATION OF MODEL CONSTRUCTION

CROWS LANDING INDUSTRIAL BUSINESS PARK
STANISLAUS COUNTY, CALIFORNIA

DRAWN BY	APPROVED BY	DATE	FIGURE
DPG	JB	8/1/16	4.2.2

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 4-2-2 Model Construction Concept.mxd



LEGEND

- Assumed Location of Confined Aquifer Well
- Contour for Predicted Groundwater Drawdown (1-foot intervals)
- Site Boundary

N

0 3
Miles

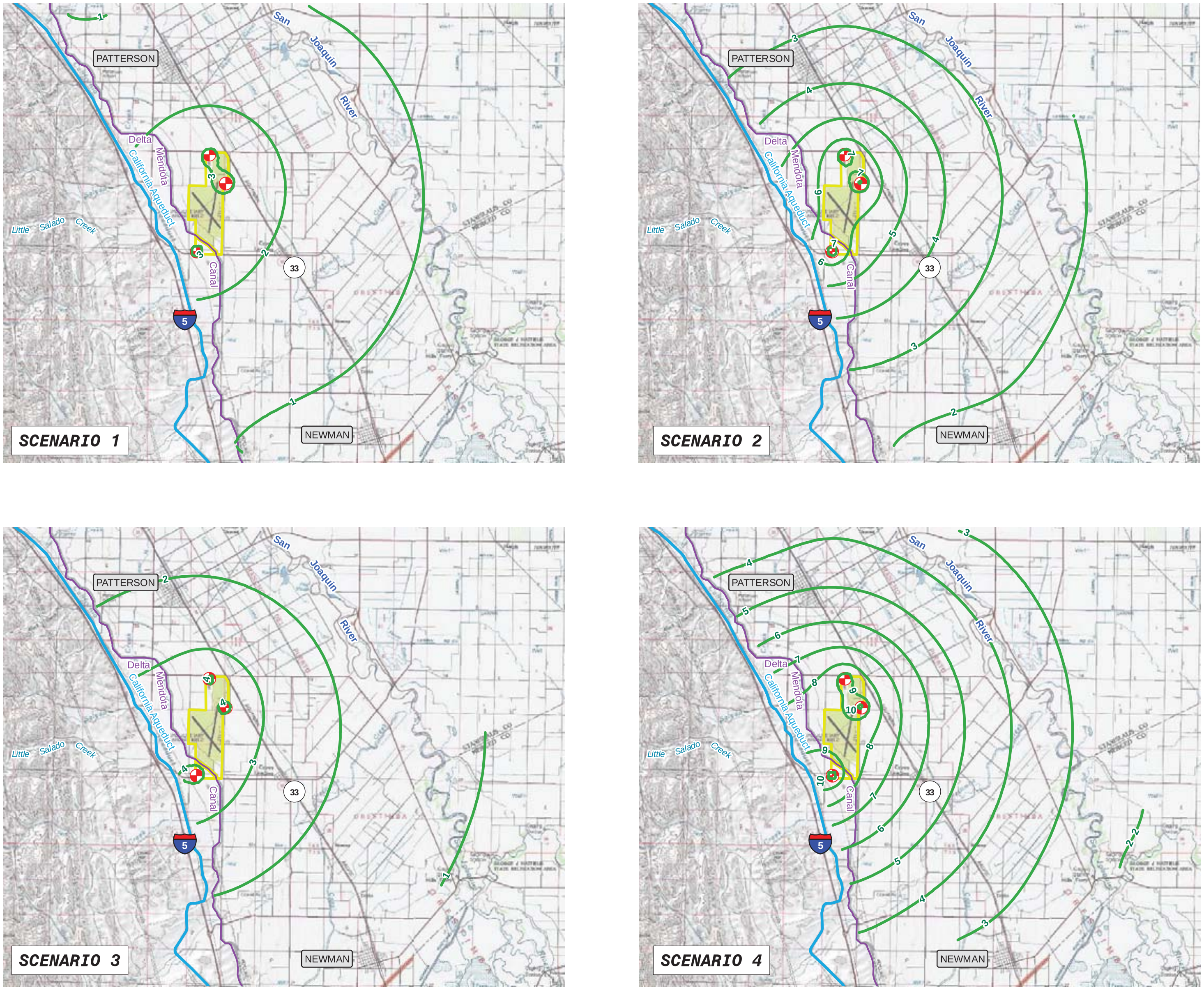
JACOBSON | JAMES
& associates, inc

TITLE
PREDICTED DRAWDOWN IN THE CONFINED AQUIFER FOR SCENARIOS 1 THROUGH 4 END OF PHASE 1

CROWS LANDING INDUSTRIAL BUSINESS PARK
STANISLAUS COUNTY, CALIFORNIA

DRAWN BY	APPROVED BY	DATE	FIGURE
DPG	JB	8/1/16	4.3.1

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 4-3-1 Phase 1 Scenarios.mxd



LEGEND

Assumed Location of Confined Aquifer Well

Contour for Predicted Groundwater Drawdown (1-foot intervals)

Site Boundary

JACOBSON | JAMES
& associates, inc

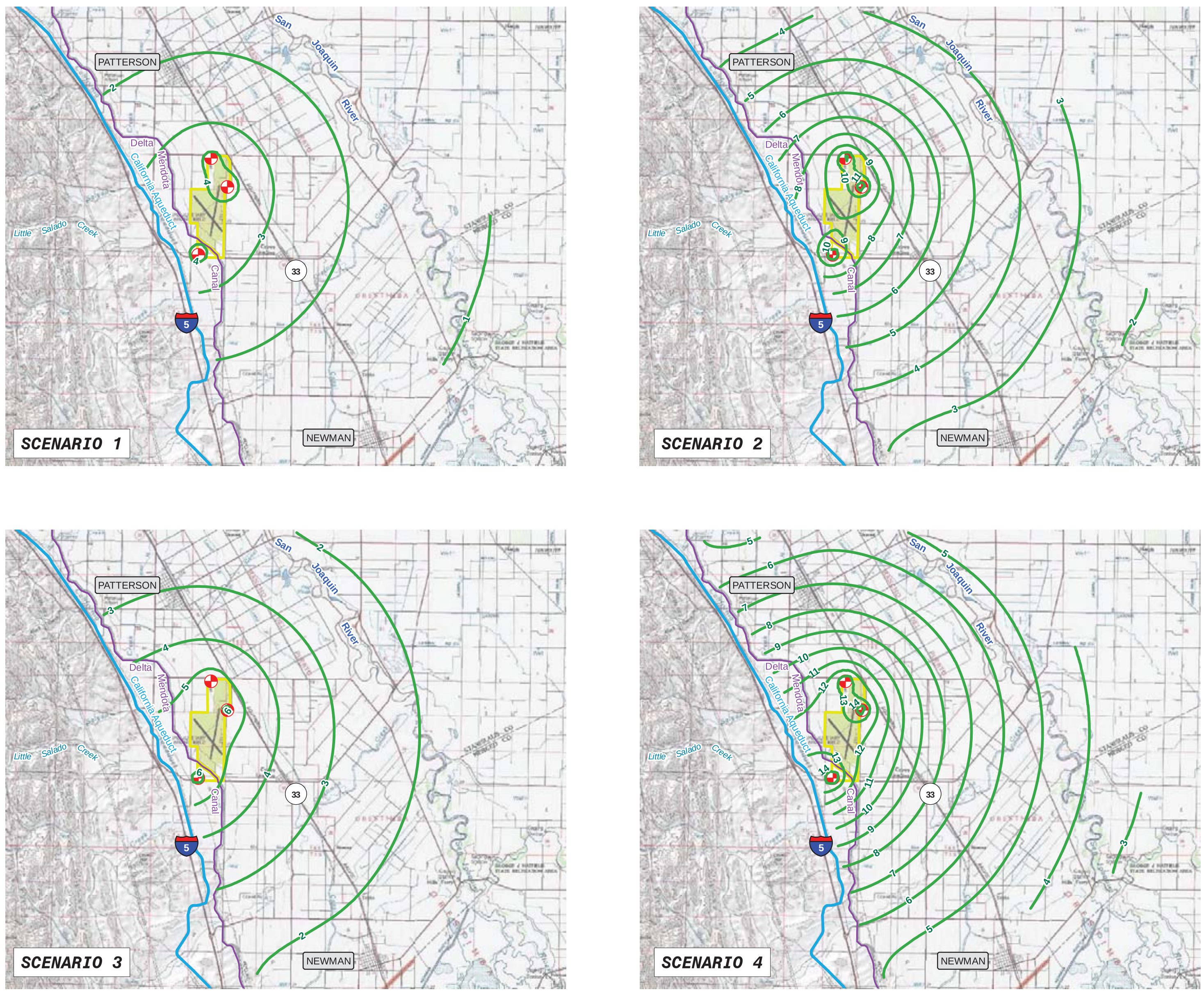
TITLE

PREDICTED DRAWDOWN IN THE CONFINED AQUIFER FOR SCENARIOS 1 THROUGH 4 END OF PHASE 2

CROWS LANDING INDUSTRIAL BUSINESS PARK
STANISLAUS COUNTY, CALIFORNIA

DRAWN BY	APPROVED BY	DATE	FIGURE
DPG	JB	8/1/16	4.3.2

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 4-3-2 Phase 2 Scenarios.mxd



LEGEND

- Assumed Location of Confined Aquifer Well
- Contour for Predicted Groundwater Drawdown (1-foot intervals)
- Site Boundary

JACOBSON | JAMES
& associates, inc

TITLE

PREDICTED DRAWDOWN IN THE CONFINED AQUIFER FOR SCENARIOS 1 THROUGH 4 END OF PHASE 3

CROWS LANDING INDUSTRIAL BUSINESS PARK
STANISLAUS COUNTY, CALIFORNIA

DRAWN BY	APPROVED BY	DATE	FIGURE
DPG	JB	8/1/16	4.3.3

Path: J:\GIS\StanislausCounty\CrowsLanding\Figure 4-3-3 Phase 3 Scenarios.mxd

5.0 IMPACT EVALUATION

This section presents an evaluation of the potential environmental impacts of the Project associated with groundwater resources. The impact evaluation is provided in the form of reasoned evaluations in answer to each of the applicable significance questions contained in Appendix G of the CEQA Guidelines, listed below. The questions are grouped by topic based on the "undesirable results" defined in the County Groundwater Ordinance and the California Water Code. As such, the evaluation also provides substantial evidence whether or not the proposed new wells to be installed for the Project comply with the prohibition against unsustainable extraction contained in the County Groundwater Ordinance. An additional section is added to discuss water supplies and entitlements, which are a topic under CEQA that is not included in the Groundwater Ordinance.

5.1 Groundwater-Dependent Ecosystems

Question IV(a): Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Question IV(b): Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS?

Question IV(c): Would the project have a substantial adverse effect on a federally protected wetlands as defined by Section 404 of the Clean Water Act (including marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Groundwater near the site occurs at depths of at least 30 feet or more beneath the ground surface, so wetlands identified in the Site vicinity are not connected to the regional water table. Further east, wetlands and riparian vegetation near the San Joaquin River may be groundwater connected; however, pumping from the confined aquifer is predicted to produce negligible drawdown in this area. The project will not result in any net increase in groundwater demand from the shallow aquifer, and it is unlikely that localized drawdown around shallow aquifer pumping wells will extend as far as the San Joaquin River. As such, impacts to GDEs will be less than significant. A groundwater monitoring program will be implemented to assess project drawdown in the shallow and confined aquifer near the Site, and will be used to assess changes to the shallow aquifer well field operation to avoid excessive drawdown in any particular area (see Section 5.6). This program will further reduce the less than significant impacts to GDEs.

5.2 Water Quality

Question IX(a): Would the project violate any water quality standards or waste discharge requirements?

Question IX(f): Would the project otherwise substantially degrade water quality?

The Project includes operation of existing and new groundwater wells in both the shallow and confined aquifers beneath the Site. New wells completed in the confined aquifer will be completed above the base of fresh water and separated from the existing hydrocarbon plume in the shallow aquifer by the Corcoran Clay. Therefore, Project pumping from the confined aquifer will not draw from areas where water is known to have low quality, and will not interfere with shallow aquifer remediation efforts. Pumping from the shallow aquifer to meet non-potable Project water demand will occur outside of the 2,000-foot pumping restriction around the IRP Site 17 contamination plume to avoid capture of contaminated water or interference with remediation efforts. No degradation of irrigation water has been reported over time, which indicates that infiltration of applied groundwater does not substantially degrade groundwater quality, and poor quality water is not being drawn into the area. New wells installed for the Project will not be cross screened across the Corcoran Clay, and so will not create a conduit between zones of varying water quality. The existing cross screened irrigation well will be actively pumped as part of the project, and therefore will not serve as a conduit for water exchange between the shallow and confined aquifers. Based on these considerations, no significant impacts are anticipated.

5.3 Subsidence

Question VI(c): Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

DWR has designated the entire DMGS as having a high potential for future subsidence, and between 1 and 2.5 inches of subsidence have been reported since 2005 at continuous monitoring station P259 along State Route 33 near the northeast corner of the Site (DWR, 2016b). The DWR and Bureau of Reclamation have undertaken a joint subsidence monitoring program in support of the San Joaquin River Restoration Program that includes a geodetic control network of monitoring stations that spans the Site (USBOR, 2014). Surveying conducted in support of this program indicates that the average subsidence rate near the Site has been in the range of 0 to 0.15 feet per year between December 2011 and December 2015 (USBOR. 2016). Surveys conducted between December 2012 and December 2013 indicate slightly accelerated short term subsidence rates during that time period between 0.15 and 0.3 feet per year (USBOR, 2014). Nevertheless, the total amount of subsidence recorded near the Project site (1 to 2.5 inches) is not likely to cause damage to, or interfere with the proper functioning of, surface infrastructure.

As discussed in Section 3.5, subsidence in the San Joaquin Valley has occurred mainly when compressible clays are dewatered as a result of drawdown in the confined aquifer system beneath the Corcoran Clay to below historical low levels. Long term hydrographs are not available for any of the wells at the Site; however, as discussed in Section 3.4.1 and shown on Figure 3.4.1, several wells with long terms hydrograph data are located in the region south of the Site near the City of Newman (DWR, 2016d). Current groundwater levels in the well with the longest period of record (State Well No. 06S08E29J001M) are approximately 40 feet above their historical low level in October 1952. Conversely, groundwater levels in State Well No.'s 07S08D14D001M and 06S08E34M001M are at their lowest recorded levels; however, water level data are not available for these wells prior to October 1958 and March 1959, respectively, so it is not known whether the current groundwater level elevations at these wells represents the historical low at these locations.

Based on the above, it is possible that drawdown induced by the Project near the Delta-Mendota Canal (3 feet [best case] to 13 feet [worst case] at the end of Phase 3 buildout) could lower groundwater levels to near or below historical low levels. Some subsidence could be induced as a result; however, given the limited amount of drawdown predicted and that only 1 to 2.5 inches of subsidence has been reported near the Site to date, the likelihood of subsidence that substantially interferes with surface land uses and infrastructure is judged to be small. Nevertheless, Mitigation Measure (MM) Water-01 is proposed to monitor for active subsidence and make adjustments to the groundwater extraction program, if needed (see Section 5.6). With implementation of MM Water-01, impacts will be less than significant.

5.4 Chronic Drawdown and Diminution of Supply

Question IX(b): Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Operation of the potable water production wells for the Projects will result in groundwater level drawdown in the confined aquifer in the region around the Site, and will result in interference drawdown to existing supply wells completed in this aquifer. Regional drawdown, if it represents a substantial fraction of the overall available drawdown or groundwater in storage in an aquifer system, can result in less groundwater being available for future supply, insufficient availability of groundwater during dry periods, or a general increase in groundwater supply development costs. Interference drawdown is a more localized effect that can decrease well yield and, in extreme cases, cause wells to go dry. The wells potentially most vulnerable to interference drawdown are domestic wells, which are generally shallower than municipal, industrial and irrigation wells that are completed to greater depths and have greater pumping capacities. In the Site vicinity, domestic wells tend to be completed in the shallow aquifer; whereas, higher capacity production wells are completed in either the shallow or the confined aquifer (or both).

The worst case predicted Project-induced drawdown in the confined aquifer at full build-out is approximately 13 feet. This is less than 10 percent of the available drawdown above the top of the confined aquifer, and is unlikely to result in a significant depletion in regional supplies. For perspective, urban and agricultural groundwater extraction was estimated to be 508,000 AFY for the DMGS (DWR, 2006). An operational yield study by the City of Patterson estimated that the city could pump up to 12,000 AFY without significantly impacting the use of groundwater resources in the area surrounding Patterson's sphere of influence (RMC, 2016). The City of Newman pumped approximately 4,200 acre-feet of water in 2012 (KDSA, 2013). A drawdown of less than 20 feet would not be expected to result in a significant diminution in the yield in a production well, as it typically represents less than 10 percent of the available drawdown. Drawdown in the shallow aquifer from pumping in the confined aquifer is expected to be negligible. The Project will not result in any net increase in groundwater demand from the shallow aquifer; however, if shallow Project wells located near the Site boundary are pumped excessively, nearby existing off-site domestic wells could experience drawdown in excess of 5 feet, which could potentially result in a significant diminution in yield in a very shallow well. MM Water-02 is proposed to place new shallow wells at least 250 feet from the nearest Site boundary. In addition, in order to prevent potential adverse effects to domestic wells, MM Water-03 is proposed to implement a groundwater level monitoring program and curtail pumping of nearby Project wells if drawdown in excess of 5 feet is observed near an existing domestic well. (See Section 5.6 for a description of these mitigation measures.)

Development of the Project will include retention of stormwater such that off Site stormwater flows do not increase above pre-development flows. The majority of this retention will occur as a result of water infiltration in the retention basins to be constructed on the northeast side of the CLIBP. In addition, the Project will require implementation of LID performance standards for stormwater capture and recharge at each developed parcel in order to maintain the existing groundwater balance in the shallow aquifer.

Based on the above information, with implementation of MM Water-02 and MM Water-03, Project impacts to groundwater supplies, aquifer volume, and lowering of the groundwater table will be less than significant.

Question XVIII(b): Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Predictive modeling indicates that drawdown associated with Project pumping from the confined aquifer will contribute incrementally to the cones of depression observed to the northwest and south of the Site. The Project-related drawdown at the off-Site cones of depression is predicted to range from less than 1 foot (best case) to 6 feet (worst case) at completion of Phase 3 buildout. These cones of depression appear to be associated with increased extraction during recent drought conditions and curtailment of surface water deliveries, and have groundwater levels that are up to about 50 to 60 feet lower than the surrounding groundwater levels. Thus, the project would contribute about 1 to 10 percent of the depth of these cones of depression as of the end of 2015. However, long-term well hydrographs indicate that water levels have historically rebounded relatively quickly when stresses are relieved (i.e., when drought conditions end or demand is met by surface water deliveries), so it is likely that these cones of depression will recover at least partly during non-drought conditions. Subsidence and other undesirable results have not been reported in the vicinity of these cones of depression.

Municipal groundwater demand by the City of Patterson is projected to increase from 6,376 AFY in 2020 to 11,801 AFY in 2040 (RMC, 2016). Proportionally similar increases in urban demand may be expected by the City of Newman and the community of Crows Landing, assuming they experience similar urban growth. These increases in urban demand will be offset by decreased agricultural demand as land use is changed from agricultural to urban to accommodate the population growth on which the water demand forecasts are built. In addition, these communities will be required to comply with a GSP adopted under SGMA to assure the sustainable management of local groundwater supplies by 2040. The communities of Patterson and Newman are currently considering becoming Groundwater Sustainability Agencies that will implement and enforce the GSP within their jurisdiction.

Based on these considerations, the groundwater resources impacts associated with the Project will be less than cumulatively considerable.

5.5 Water Supply and Entitlements

Question XVII(d): Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Based on the above analyses, adequate groundwater supplies are available for Project use in the shallow and confined aquifers beneath the Site without causing or contributing to undesirable results as defined in the County Groundwater Ordinance, SGMA, and the California Water Code. As such, the proposed groundwater extraction would comply with these regulations. In addition, the Site is not located in an adjudicated basin, or in a special act district that regulates the extraction of groundwater. The Project would be able to supply groundwater for beneficial use on the properties to be developed in the business park under an appropriative groundwater right. No new entitlements would be required, and the Project would therefore have no impact.

5.6 Proposed Mitigation Measures

This section identifies mitigation measures to reduce potentially significant impacts associated with the Project to less than significant levels.

5.6.1 MM Water-01 – Subsidence Monitoring

The objective of MM Water-01 is to prevent subsidence associated with the Project. The Project shall include installation and semi-annual monitoring of three subsidence monuments at the Site. The exact construction, placement, and monitoring methodology shall be defined in a subsidence monitoring plan to be prepared for County approval before Project implementation. It is advised that one monument be placed near the Delta-Mendota Canal and/or the California Aqueduct, for which subsidence may be of particular concern. The monitoring entity shall report the subsidence monitoring activities and findings semi-annually to Stanislaus County for each year in July and January. If subsidence in excess of 2 inches is measured at a monument, an investigation shall be undertaken to determine the source of the subsidence and whether changes need to be made to the water supply pumping program to arrest further subsidence that could be damaging to infrastructure.

5.6.2 MM Water-02 – Well Setbacks

The objective of MM Water-02 is to prevent interference drawdown to off-Site wells. Any new shallow groundwater extraction well shall be placed at least 250 feet inside of the nearest Site boundary to minimize potential drawdown effects on shallow aquifer wells located on nearby properties. A well permit application shall be prepared by the applicant for County approval to identify the new well(s) purpose, location(s), and construction details before the wells are constructed.

5.6.3 MM Water-03 – Groundwater Level Monitoring

The objective of MM Water-03 is to assess and verify the amount of drawdown induced by Project pumping, and to prevent potential interference drawdown to shallow off-Site wells that could damage the wells or significantly decrease their yield. A groundwater monitoring plan that outlines the monitoring wells network and procedures for the groundwater level monitoring program shall be prepared by the applicant for County approval before Project implementation. Groundwater levels shall be measured monthly to the nearest 0.1 foot bgs in the shallow and confined aquifers at the locations identified in the groundwater monitoring plan, and the length of time in days since the well was last operated shall also be noted. Groundwater level monitoring shall commence at least one prior to Project implementation to establish Site baseline conditions. The extent and frequency of the monitoring program shall be evaluated every five years. If Project-induced drawdown is observed in the shallow aquifer near an existing off-Site domestic well, groundwater extraction from the shallow Project well(s) located closest to the potentially-effected off site well shall be curtailed and moved to more distant wells until groundwater levels recover and Project-induced drawdown is maintained at less than 5 feet. If Project-induced drawdown in the confined aquifer measured during Phase 1 of Project exceeds the worst case predicted drawdown, a revised drawdown analysis shall be prepared, and a pumping plan shall be developed for implementation during Phase 2 and Phase 3 of the Project that prevents groundwater levels from falling below the maximum predicted worst case drawdowns at the end of Phase 3. The monitoring entity shall report the groundwater monitoring activities, findings and any corrective actions taken to Stanislaus County for each year by January 31 of the following year.

5.6.4 MM Water-04 – Recharge Enhancement Plan

The objective of MM Water-04 is to prepare a plan that describes how the Project will enhance groundwater recharge, such that any increase in Project groundwater demand on the shallow aquifer will be fully offset. The plan shall be prepared by the applicant for County approval before Project implementation. After County approval, the plan shall be implemented, including submittal of annual reports to the County by January 31 of the following year that document the amount of groundwater extracted from the shallow aquifer and the amount of recharge achieved. The plan must account for and offset any increase in the net groundwater demand, including increases resulting from development of the Project non-potable water supply and cessation of agricultural pumping and irrigation. The enhanced recharge is expected to be derived from recharge of water in the Project stormwater retention/detention basin, implementation of LID design standards for developed of parcels in the CLIBP that increase stormwater retention and recharge, and decreased non-potable water demand through the use of xeriscape landscape designs. The plan shall include design details and describe maintenance activities, and shall include supporting calculations or modeling to demonstrate that its implementation will result in sufficient recharge.

6.0 REFERENCES

AECOM, 2011. *Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area, Groundwater Management Plan Update.* Revised November 7.

AECOM, 2016a. *Draft County of Stanislaus, Crows Landing Industrial Business Park, SB 610 Water Supply Assessment.* February.

AECOM, 2016b. *Drainage Study for Crows Landing Industrial Business Park, Stanislaus County.* October.

AECOM, 2016c. *Draft Specific Plan for Crows Landing Industrial Business Park, Stanislaus County.* October.

AECOM and VVH Consulting Engineers, 2016. *Crows Landing Industrial Business Park, Water Supply (Potable and Non-Potable) Infrastructure and Facilities Study.* September 27.

California Department of Water Resources (DWR), 2003. *California's Groundwater, Bulletin 118 – Update 2003.* October.

DWR, 2006. *California's Groundwater Bulletin 118, San Joaquin River Hydrologic Region, San Joaquin Valley Groundwater Basin, Delta-Mendota Subbasin.* Updated January 20.

DWR, 2013. *California's Groundwater Update 2013, A Compilation of Enhanced Content for California Water Plan Update 2013, Chapter 8 – San Joaquin River Hydrologic Region.*

DWR, 2016a. SGM Sustainable Groundwater Management, Critically Overdrafted Basins. http://www.water.ca.gov/groundwater/sgm/cod.cfm. *Accessed May 20.*

DWR, 2016b. Groundwater Information Center Interactive Map Application. https://gis.water.ca.gov/app/gicima/. *Accessed May 20.*

DWR, 2016c. California Data Exchange Center Data for San Joaquin River Gaging Stations. http://cdec.water.ca.gov/cdecstation/?sta=SMN, http://cdec.water.ca.gov/cdecstation/?sta=SCL. Accessed July 11.

DWR, 2016d. California Statewide Groundwater Elevation Monitoring (CASGEM) website. http://www.water.ca.gov/groundwater/casgem/. Accessed July.

DWR and Bureau of Reclamation, 2014. Technical Memorandum, Subsidence Monitoring 2011 – 2013, San Joaquin River Restoration Program. September.

Fetter, C.W., 1994. *Applied Hydrogeology.* Third Edition. 691 p.

Fitts Geosolutions, 2016. AnAqSim Release 2016-2. July 8.

Google Earth, 2016. Historical Imagery from Multiple Data Providers, 2006 to 2015. Accessed July 28.

Kenneth D. Schmidt and Associates (KDSA), 2010. *Existing Groundwater Conditions in the Vicinity of the Proposed Riddle Surface Mine, Stanislaus County, California.* September.

KDSA, 2013. *Supplement to Water Supply Assessment for Arambel Business Park/KDN Retail Center.* August.

Kleinfelder, 2016. *Permit No.15-293, Supplemental Request: Well-1 Aquifer Pumping Test and Drawdown Evaluation, Joe's Travel Plaza, Westley, CA.* March 15.

Page, R.W., 1973. Base of Fresh Ground Water (Approximately 3,000 Micromhos) in the San Joaquin Valley, California. U.S. Geological Survey Open File Report.

Reilly, Thomas E., Franke, O. Lehn, and Bennett, Gordon D., 1987. *The Principle of Superposition and its Application in Ground-Water Hydraulics.* U.S. Geological Survey Techniques of Water-Resources Investigations 03-B6.

RMC, 2016. *City of Patterson 2015 Urban Water Management Plan, Final.* June.

Sperling's Best Places, 2016. http://www.bestplaces.net/climate/county/california/stanislaus. *Accessed April 25.*

Summers Engineering, 2013. *WaterSMART: Water and Energy Efficiency Grant for FY 2013, Patterson Irrigation District, Marshall Road and Spanish Drain Return System.*

Turlock Irrigation District, 2012. *2012 Agricultural Water Management Plan.*

U.S. Bureau of Reclamation (USBOR), 2014. Technical Memorandum, Subsidence Monitoring San Joaquin River Restoration Program 2011 – 2013.

USBOR, 2016. Central Valley Subsidence, Annual Rates December 2011 – December 2015.

U.S. Geological Survey (USGS), 2004. *Hydrogeologic Characterization of the Modesto Area, San Joaquin Valley, California*: U.S. Geological Survey Scientific Investigations Report 2004-5232, 54 p.

USGS, 2009. *Groundwater Availability of the Central Valley Aquifer, California*: U.S. Geological Survey Professional Paper 1766, 225 p.

USGS, 2016. Delta-Mendota Canal: Evaluation of Groundwater Conditions and Land Subsidence. http://ca.water.usgs.gov/projects/central-valley/delta-mendota-canal-subsidence.html. Accessed July 28, 2016.

Ward, W., 2016. Personal communication regarding analysis of specific capacity test data for two wells near the proposed Crows Landing Industrial Business Park. To M. Tietze, JJ&A. July 14.

Wheeler, D., 2016. Personal communication regarding groundwater extraction and use at the proposed Crows Landing Industrial Business Park. To M. Tietze, JJ&A. June 13.

APPENDIX A

EVALUATION OF POTENTIAL STORMWATER CAPTURE EFFICIENCY FROM LOW IMPACT DEVELOPMENT STANDARDS

Appendix A: Evaluation of Potential Stormwater Capture Efficiency from Low Impact Development Standards

A screening level desktop study was performed to evaluate potential stormwater capture efficiency from Low Impact Development (LID) standards using the U.S. Environmental Protection Agency's (EPA) National Stormwater Calculator (SWC) software[1]. The study was performed as a superposition model to evaluate potential increases in capture and infiltration of surface runoff with LID elements compared with a baseline condition (buildout of the Project with no LID elements, but with required stormwater retention using a retention pond in the northeast portion of the Site). Attachment A-1 shows the SWC summary reports for both the baseline and LID implementation conditions. The basis for key assumptions and inputs are summarized below:

- The calculated storm water capture applies to additional capture that may be achieved at individual development sites through the implementation of LID elements, such as retention ponds, permeable pavements, street planters, vegetated swales, and disconnection. It is assumed that the stormwater retention basin to be constructed in the northeast portion of the Site will have sufficient infiltration capacity to maintain pre-development recharge rates.
- The site area was defined as 1 acre so that runoff calculations could be scaled appropriately based on the size of development by Project phase.
- The soil was assigned "moderately high" runoff potential (clay loam type) based on soil survey data accessed by the SWC.
- The soil was assigned a drainage rate of 0.6 feet per day based on the mean saturated hydraulic conductivity at the Site[2].
- The topography was assigned a flat (2%) slope.
- Precipitation was assigned as 11.53 inches per year based on average rainfall data at Newman from 1970 to 2006 (as accessed by the SWC).
- Evaporation was assigned as 0.22 inches per day based on data at Newman from 1970 to 2006 (as accessed by the SWC).
- The SWC default climate change scenario was applied for the near term scenario (2020 through 2049).
- Land cover (at buildout) was estimated to be 75% impervious surface based on visual review of typical recent commercial projects in the County, with the remaining 25% assigned as "lawn' to simulate landscaping
- Conceptual LID elements[3] were assigned as follows:

---

[1] EPA, 2016. National Stormwater Calculator Desktop Application. Version 1.1.0.2.

[2] University of California Davis and U.S. Department of Agriculture Natural Resources Conservation Service, 2016. California Soil Properties Soil Properties App. http://casoilresource.lawr.ucdavis.edu/ca-soil-properties/. Accessed July 31.

- The baseline condition did not include any LID elements.
- The LID implementation condition assumed the Project impervious surfaces consisted of: 20% permeable pavement; 10% infiltration basins; 10% disconnection (directing runoff from impervious areas such as roofs or parking lots onto pervious surfaces rather than into storm drains); and 2% street planters.

Based on the inputs described above, the SWC estimated that 2.89 inches (0.24 foot) per year of runoff per acre would be captured for local infiltration with LID implementation compared with the baseline condition with no local LID elements (Project detention basin only). The volume of additional runoff that could be captured with LID implementation at buildout of Phases 1, 2, and 3 is estimated to be 146, 178, and 228 AFY, respectively, as summarized in the table below.

Estimated Additional Annual Surface Runoff Capture Compared with the Baseline (No LID) Condition

Timeframe	Additional Surface Runoff Capture (AFY)
Additional Capture by Buildout Phase	
Phase 1 (810 acres developed)	146
Phase 2 (177 acres developed)	32
Phase 3 (274 acres developed)	49
Cumulative Additional Capture at Phased Buildout	
Phase 1 (810 acres developed)	146
Phase 2 (987 acres developed)	178
Phase 3 (1,261 acres developed)	228

[3] Specific LID elements would be determined during Project design.

National Stormwater Calculator Report

Site Description

Crows Landing Industrial Business Park

Parameter	Current Scenario	Baseline Scenario
Site Area (acres)	1	1
Hydrologic Soil Group	C	C
Hydraulic Conductivity (in/hr)	0.6	0.6
Surface Slope (%)	2	2
Precip. Data Source	NEWMAN	NEWMAN
Evap. Data Source	NEWMAN	NEWMAN
Climate Change Scenario	None	None
% Forest	0	0
% Meadow	0	0
% Lawn	25	25
% Desert	0	0
% Impervious	75	75
Years Analyzed	20	20
Ignore Consecutive Wet Days	False	False
Wet Day Threshold (inches)	0.10	0.10

LID Control	Current Scenario	Baseline Scenario
Disconnection	10 / 100	0
Rain Harvesting	0	0
Rain Gardens	0	0
Green Roofs	0	0
Street Planters	2 / 6	0
Infiltration Basins	10 / 5	0
Porous Pavement	20 / 100	0

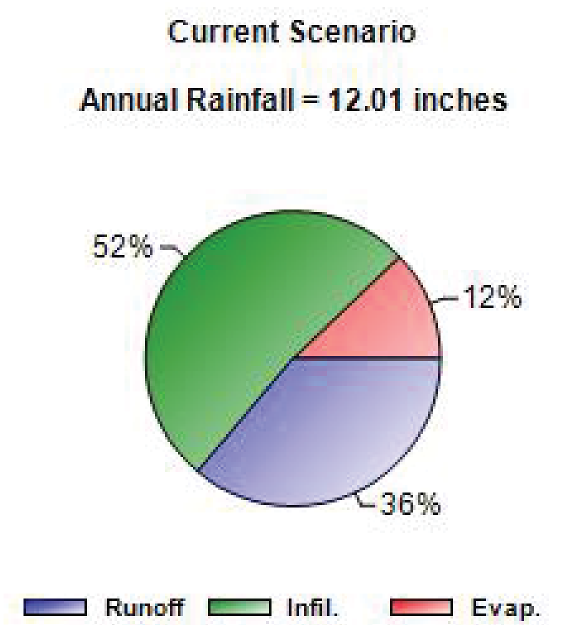
% of impervious area treated / % of treated area used for LID

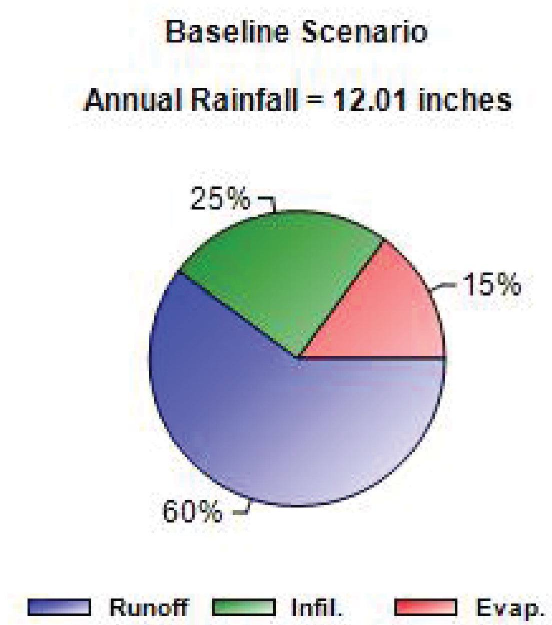
National Stormwater Calculator Report

Summary Results

Crows Landing Industrial Business Park

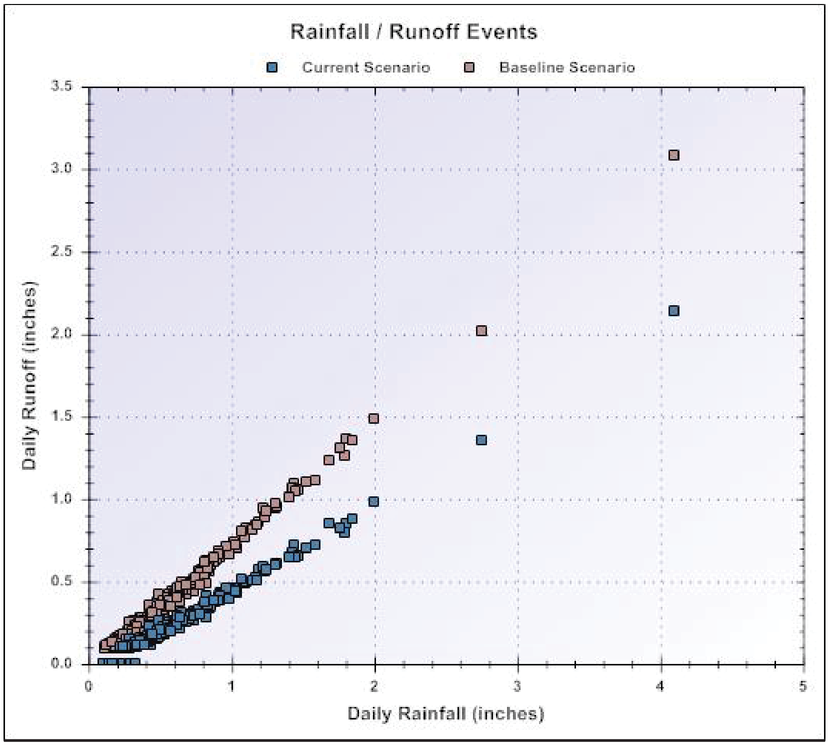
Statistic	Current Scenario	Baseline Scenario
Average Annual Rainfall (inches)	12.01	12.01
Average Annual Runoff (inches)	4.35	7.24
Days per Year With Rainfall	29.68	29.63
Days per Year with Runoff	13.79	19.64
Percent of Wet Days Retained	53.54	33.73
Smallest Rainfall w/ Runoff (inches)	0.22	0.10
Largest Rainfall w/o Runoff (inches)	0.33	0.23
Max. Rainfall Retained (inches)	1.96	1.02

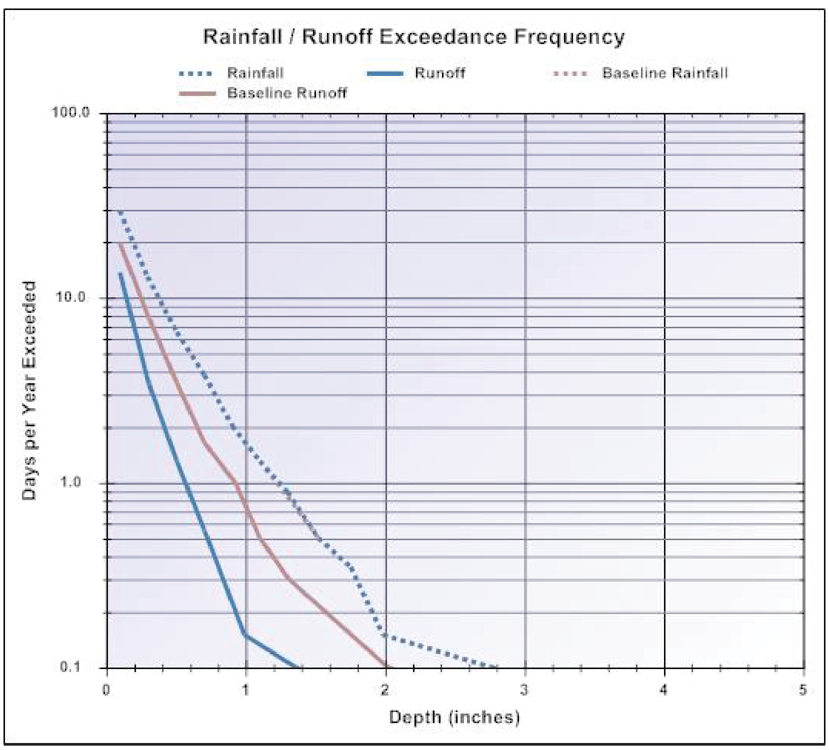




National Stormwater Calculator Report

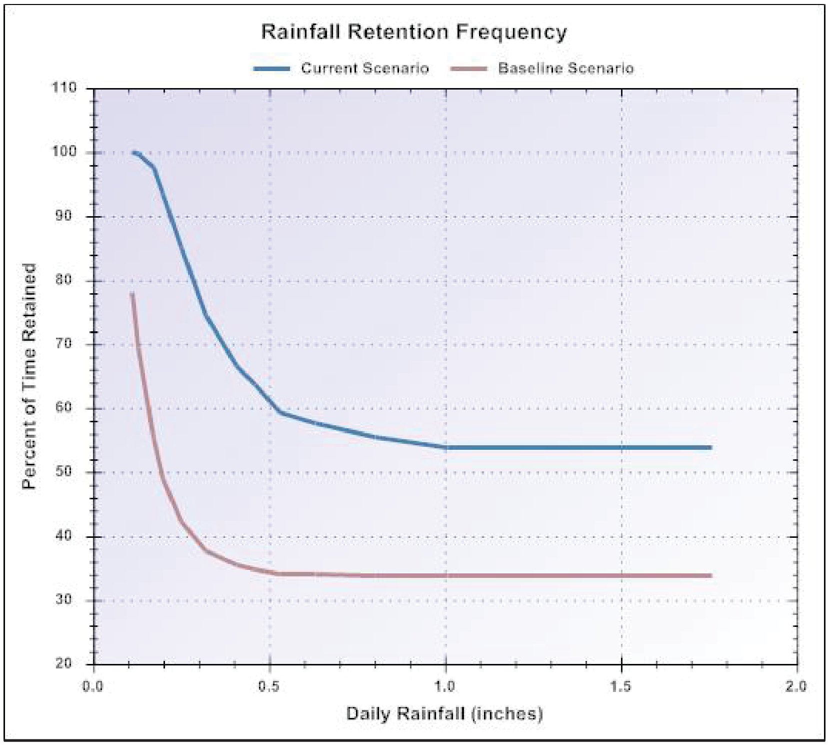
Crows Landing Industrial Business Park

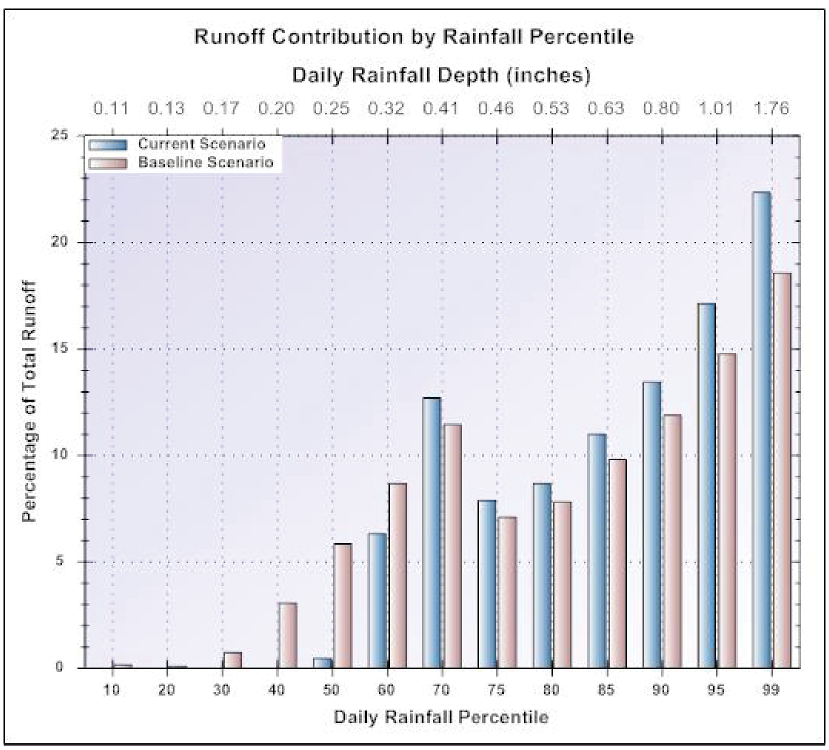




National Stormwater Calculator Report

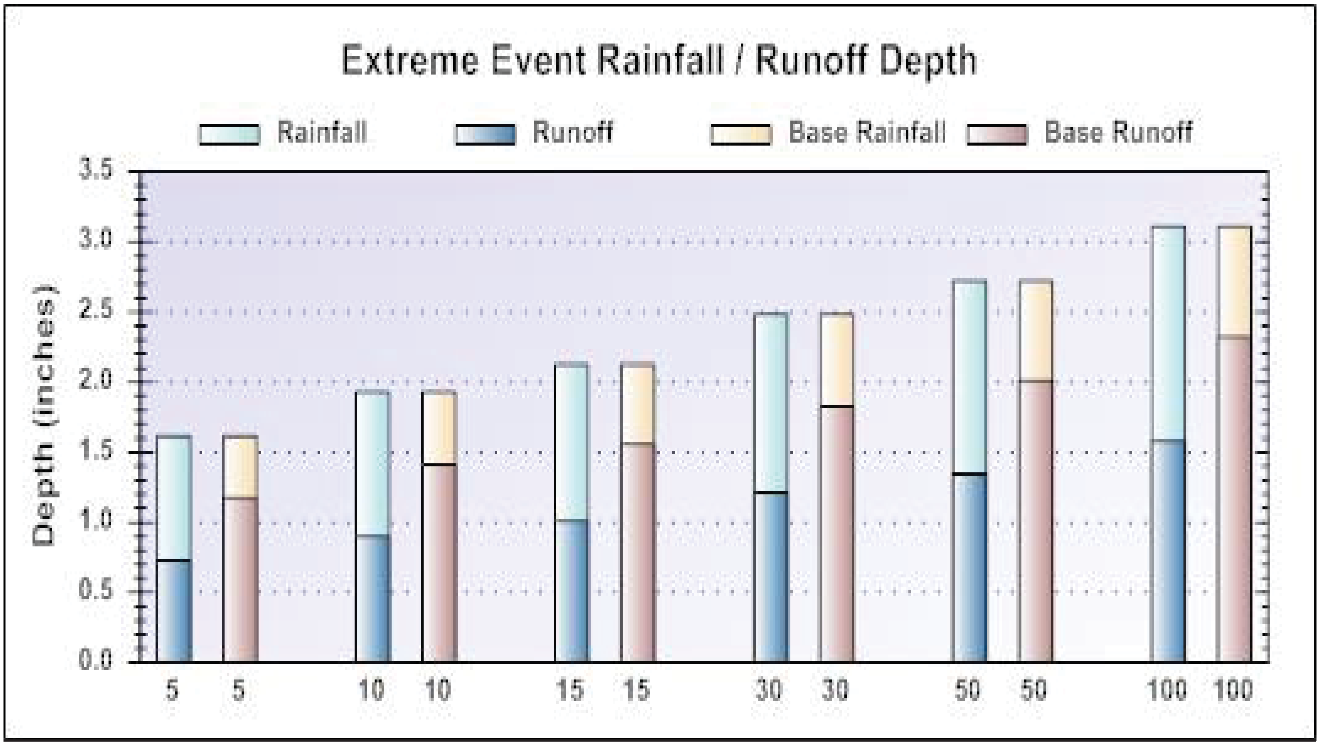
Crows Landing Industrial Business Park

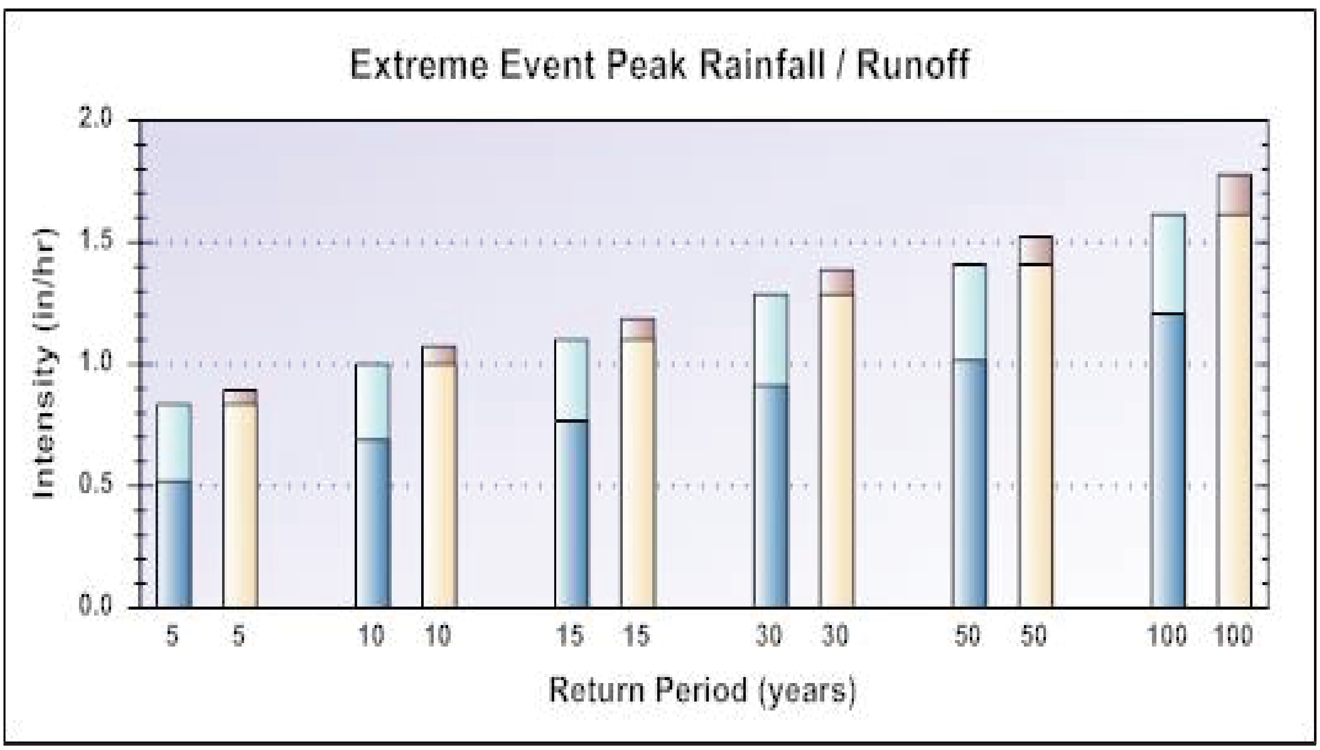




National Stormwater Calculator Report

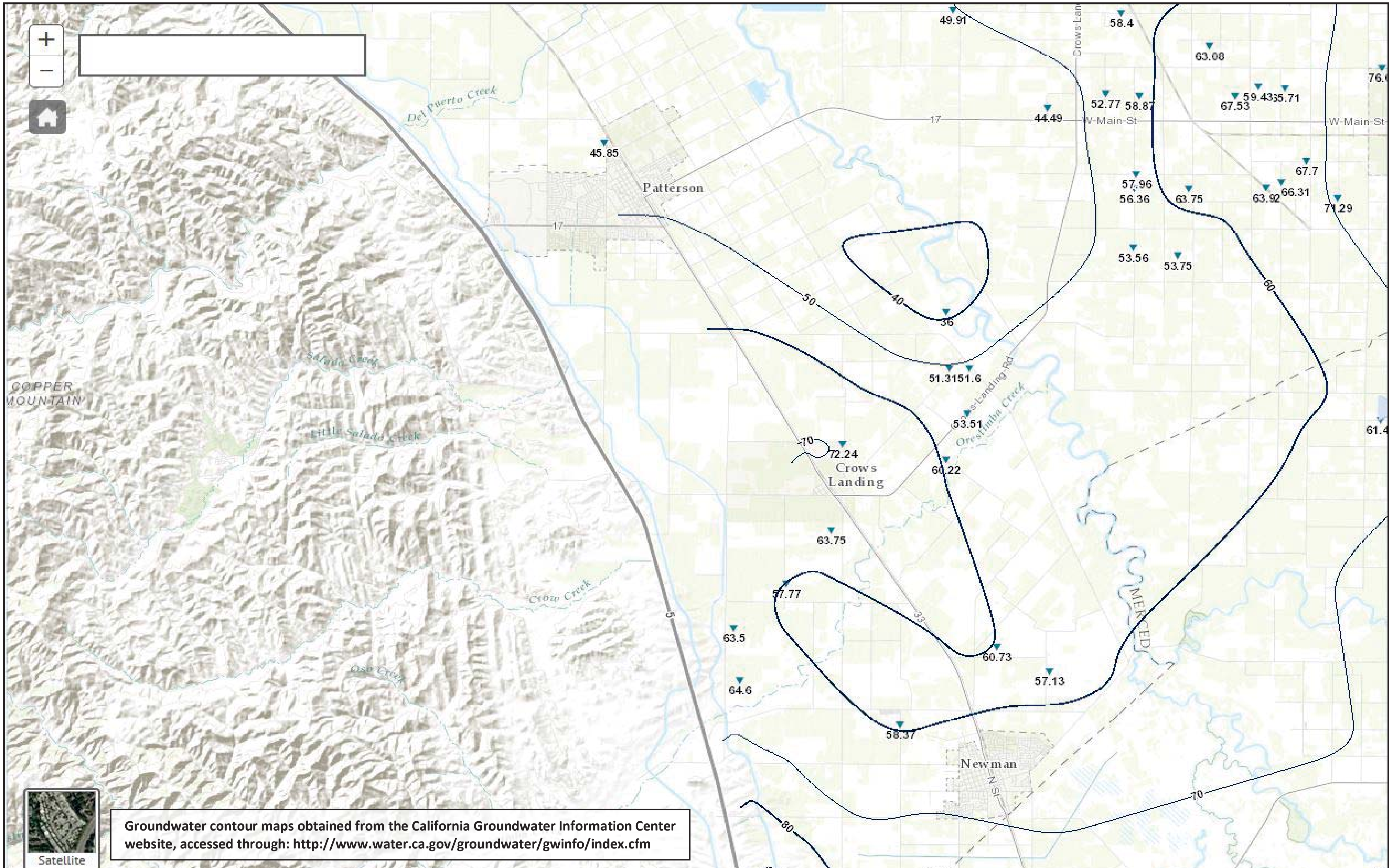
Crows Landing Industrial Business Park





APPENDIX B

GROUNDWATER ELEVATION CONTOUR MAPS FROM THE DWR GROUNDWATER INFORMATION CENTER INTERACTIVE MAPPING APPLICATION



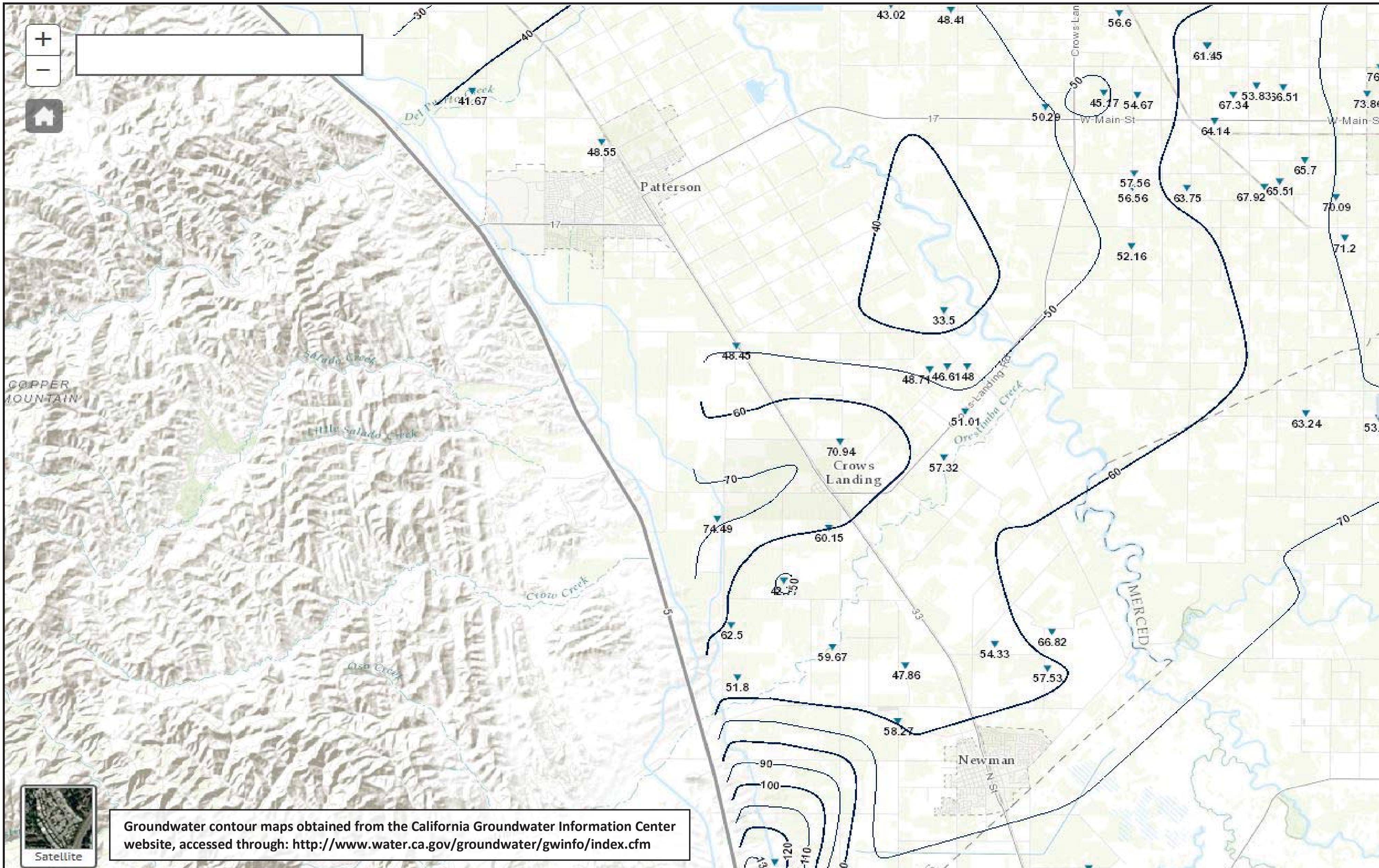
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-1

Groundwater Elevation Map for the Confined Aquifer, Spring 2011



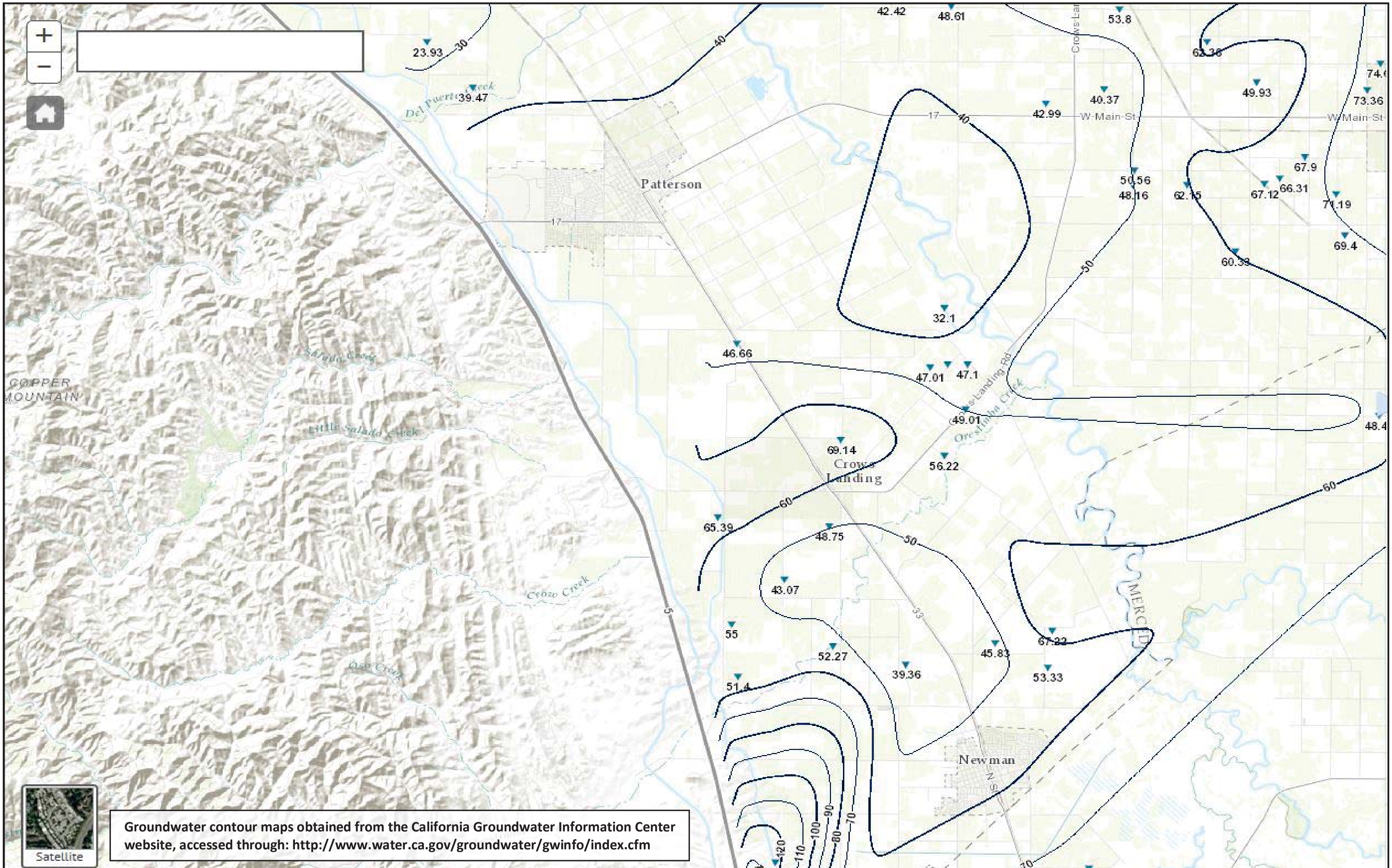
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-2

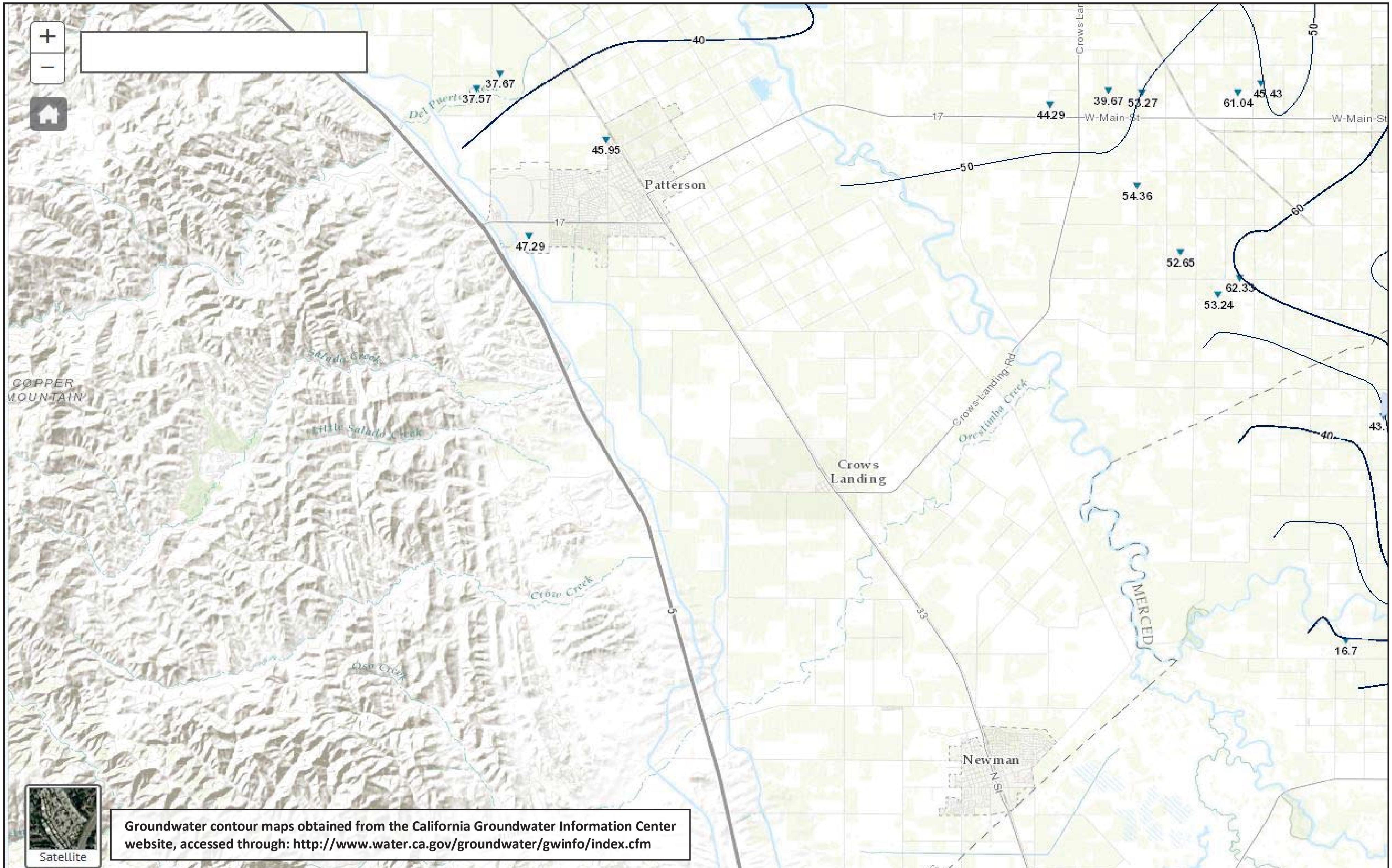
Groundwater Elevation Map for the Confined Aquifer, Spring 2012



Groundwater contour maps obtained from the California Groundwater Information Center website, accessed through: http://www.water.ca.gov/groundwater/gwinfo/index.cfm

JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park Stanislaus County, California				FIGURE B-3
PROJECT NO.	DATE	DRAWN BY	APPR. BY	**Groundwater Elevation Map for the Confined Aquifer, Spring 2013**
STANCO.001	7/28/16	TC	JB	



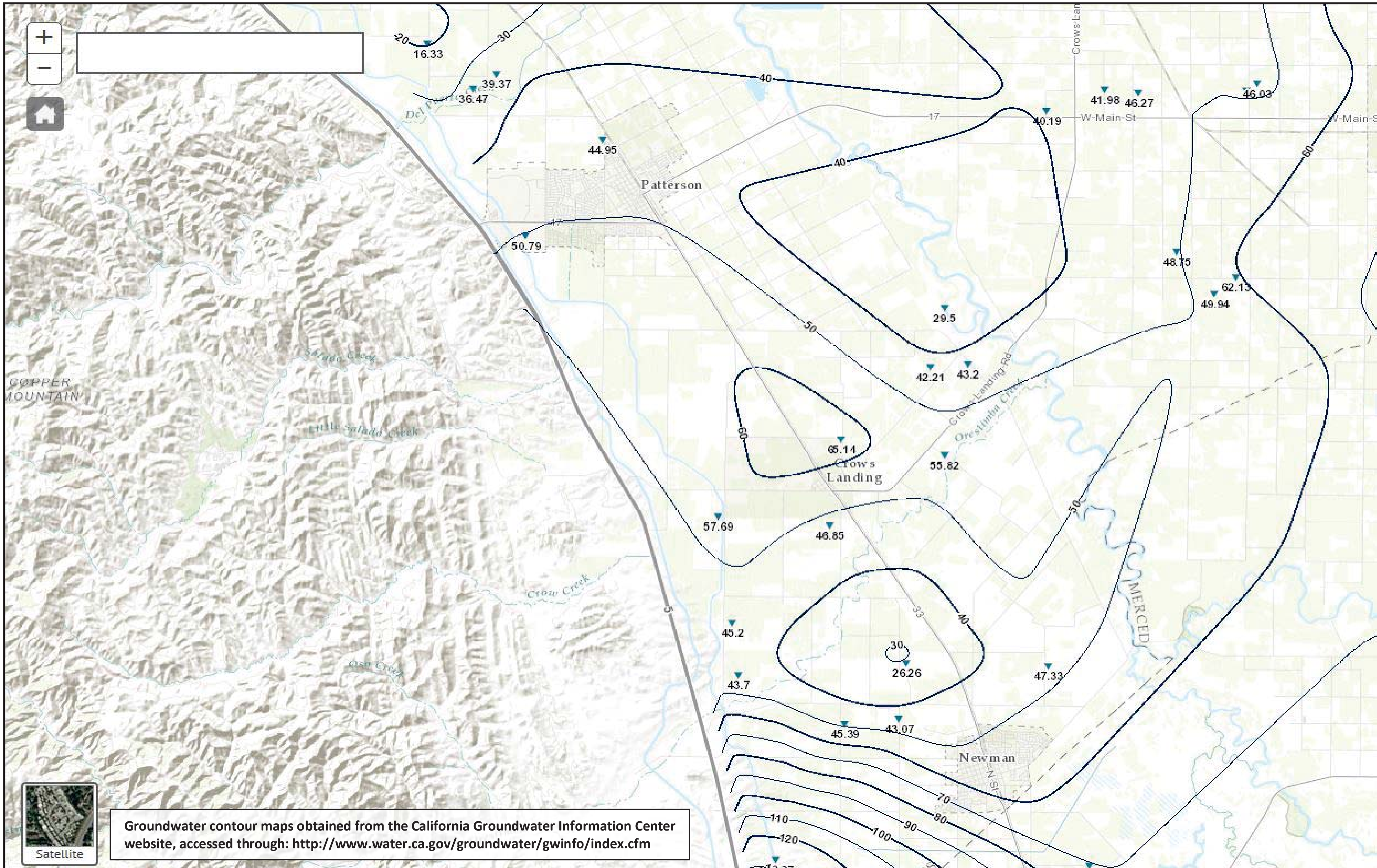
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-4

Groundwater Elevation Map for the Confined Aquifer, Fall 2013



Groundwater contour maps obtained from the California Groundwater Information Center website, accessed through: http://www.water.ca.gov/groundwater/gwinfo/index.cfm

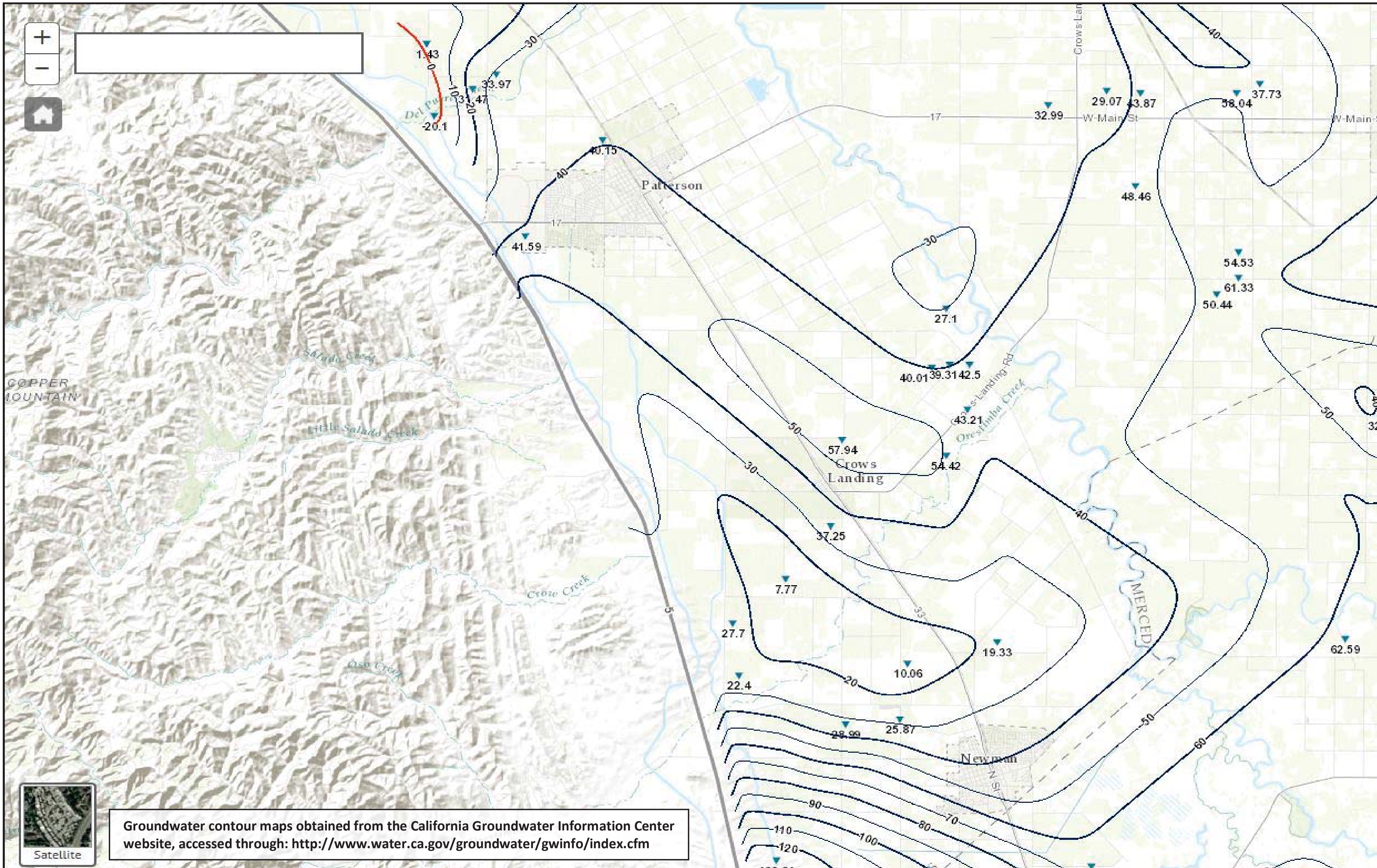
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-5

Groundwater Elevation Map for the Confined Aquifer, Spring 2014



Groundwater contour maps obtained from the California Groundwater Information Center website, accessed through: http://www.water.ca.gov/groundwater/gwinfo/index.cfm

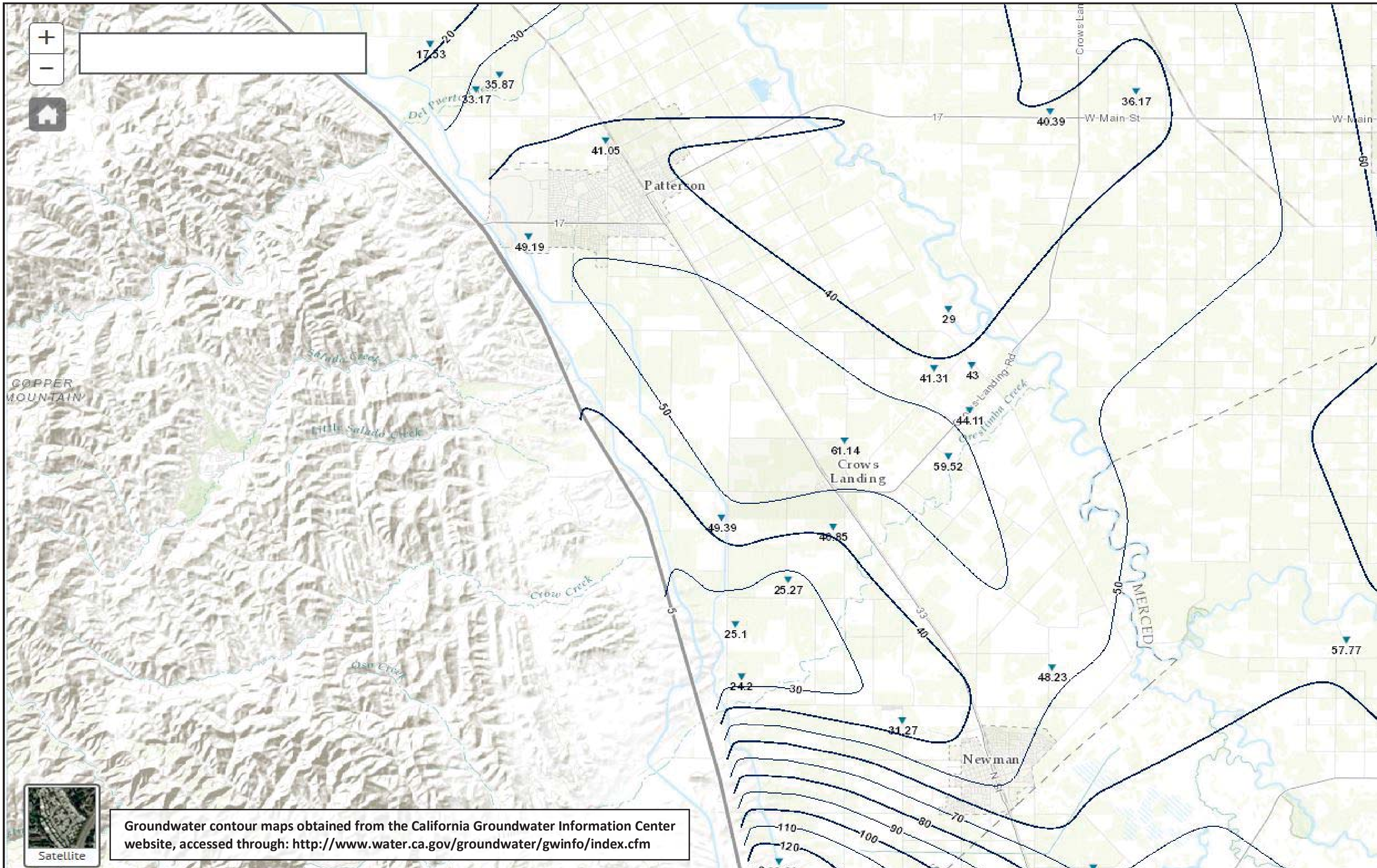
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-6

Groundwater Elevation Map for the Confined Aquifer, Fall 2014



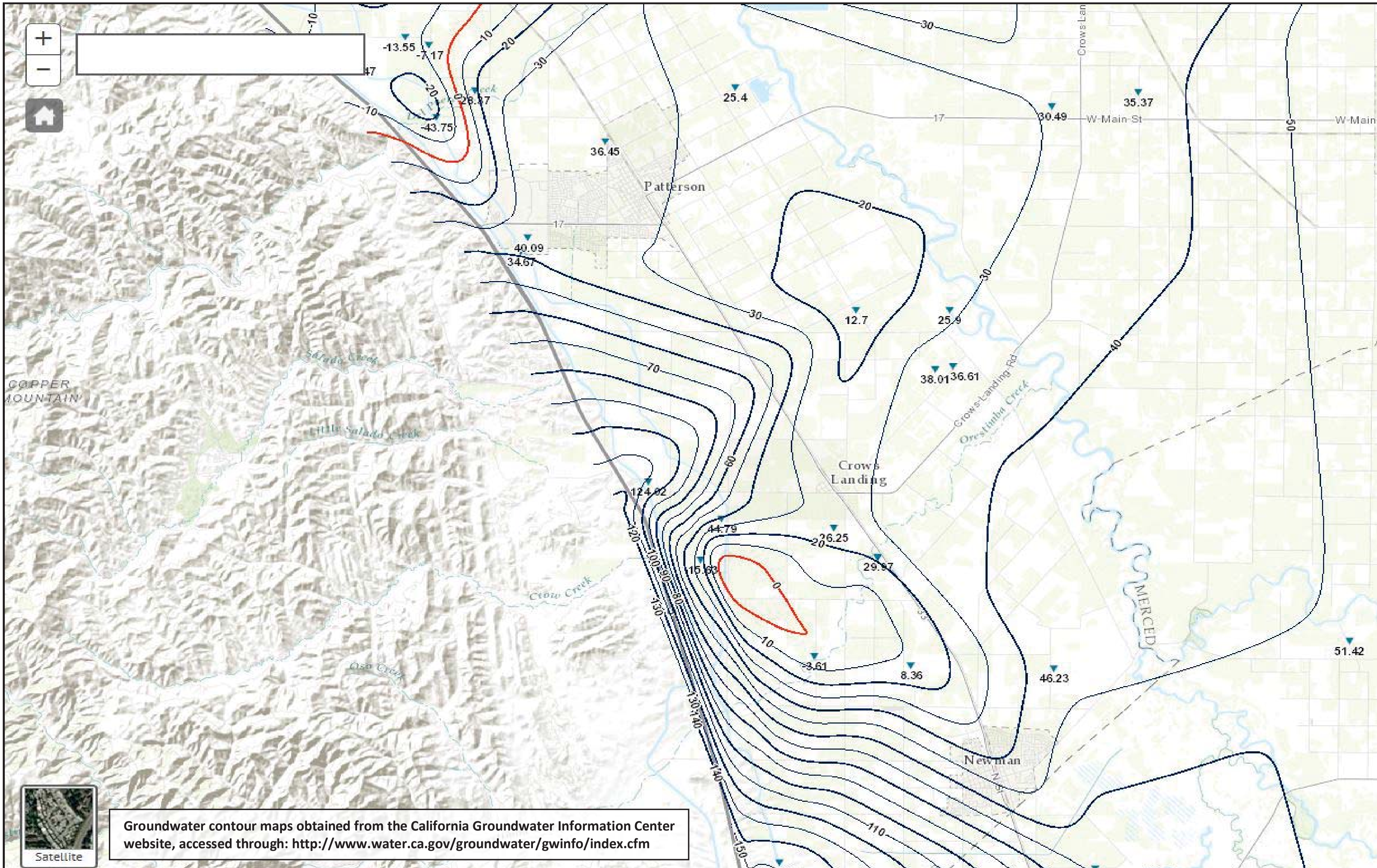
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-7

Groundwater Elevation Map for the Confined Aquifer, Spring 2015



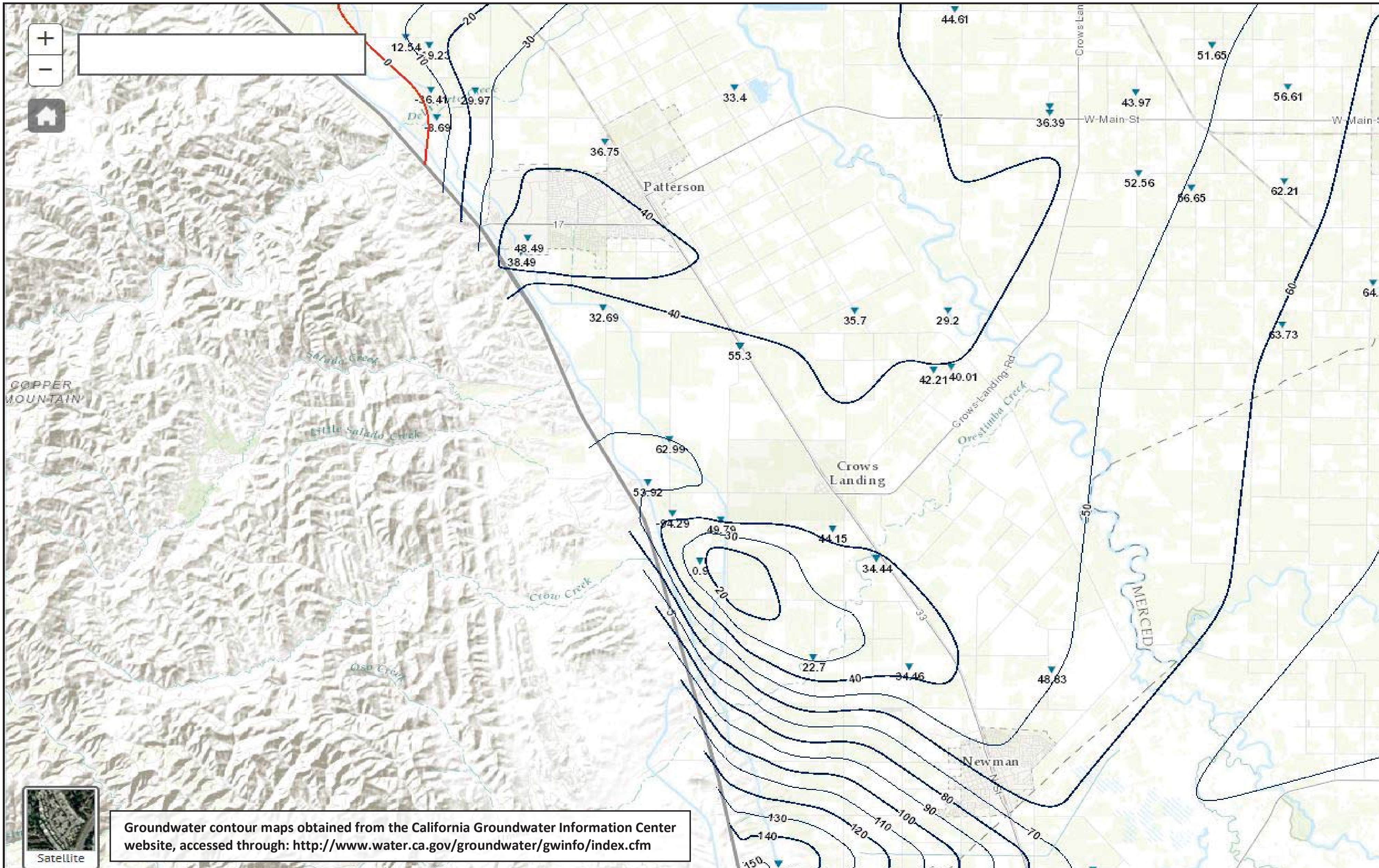
JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-8

Groundwater Elevation Map for the Confined Aquifer, Fall 2015



JACOBSON | JAMES
& associates, inc

Crows Landing Industrial Business Park
Stanislaus County, California

PROJECT NO.	DATE	DRAWN BY	APPR. BY
STANCO.001	7/28/16	TC	JB

FIGURE B-9

Groundwater Elevation Map for the Confined Aquifer, Spring 2016

APPENDIX C

Airport Layout Plan and Narrative Report, Proposed Compatibility Policies and Policy Maps to Amend the ALUCP

Draft

Airport Layout Plan
Narrative Report

CROWS LANDING
AIRPORT

Stanislaus County

May 2017

Crows Landing Airport Layout Plan Narrative Report

May 2017

Prepared for

Stanislaus County
Department of Planning and
Community Development
1010 10th Street, Suite 6800
Modesto, CA 95354

Prepared by

Mead & Hunt, Inc.

Table of Contents

CHAPTER 1

INTRODUCTION

1

INTRODUCTION

The County of Stanislaus proposes to reuse a portion of the former Crows Landing Naval Air Facility as a public-use, general aviation (GA) airport and an amenity to the Crows Landing Industrial Business Park (CLIBP). The purpose of this *Airport Layout Plan (ALP) Narrative Report* is to facilitate the development and opening of the new Crows Landing Airport. The ALP Narrative Report focuses on the immediate needs associated with opening a GA facility and documents the County's short-term and long-range development goals. Certain items, such as detailed land use plans, financial plans, management, and fixed-base operation arrangements are not specifically addressed in this report; these specific items will be studied as needs arise and budgets permit.

Throughout this report, figures and tables are located at the end of their respective chapter.

Crows Landing Airport is located in the northwestern portion of the San Joaquin Valley in Stanislaus County, California. The airport is less than 1 mile east of Interstate 5 and the Fink Road interchange, which provides regional highway connections to both Sacramento and the San Francisco Bay Area. The airport is situated 1.6 miles west of the community of Crows Landing, 4 miles south of the community of Patterson, and 80 miles southeast of the City of San Francisco (see the location map in **Figure 1A**).

BACKGROUND

The former Crows Landing Naval Auxiliary Landing Field was commissioned in 1943 to serve as a training field during World War II. The facility was reduced to caretaker status following World War II until the early 1950s, when it was used for fleet carrier landing practice during the Korean War. Throughout the 1970s and 1980s, the facility was used for practice operations by the Navy, Air Force, Army, and Coast Guard. The National Aeronautics and Space Administration (NASA) Ames Research Center, located at Moffett Field, took over operation of the facility in 1994 and ceased operations in 1997, when they proposed to declare the base as excess. Congress passed H.R. 356 in 1999, which states that, "as soon as practicable, the Administrator of NASA shall convey to Stanislaus County, California, all right, title and interest of the United States in and to the former Crows Landing Air Facility."

Since the decommissioning of the facility by NASA in the late 1990s, the Stanislaus County Board of Supervisors has pursued and studied reuse opportunities for the site. In April 2001, the Board adopted a reuse plan that would designate a portion of the property for use as a GA airport and develop other areas of the property to help offset the jobs-to -housing imbalance that has historically persisted in Stanislaus County. On October 12, 2004, the Stanislaus County Board of Supervisors accepted the conveyance of land pursuant to Public Law 106-82. The County envisioned optimizing the site's opportunities for economic development by creating a regional job center while maintaining an aviation use.

Conceptual Design

In 2006, the County developed and evaluated three land use scenarios, or concepts, to support the development of the Crows Landing Airport. The three concepts were designed to determine the extent to which the existing aviation facilities and infrastructure could be reused and integrated with new aviation-compatible uses on the remaining property:

- Concept 1: Maintain and build upon the existing intersecting runway configuration;
- Concept 2: Maintain and protect for ultimate build-out aviation facilities based upon the north/south runway (Runway 16-34); and
- Concept 3: Maintain and protect for ultimate build-out of aviation facilities based upon the northwest/southeast runway (Runway 11-29).

In September 2006, the County Board of Supervisors approved Concept 3 for the Crows Landing Airport and authorized staff to seek a long-term development partner to assist in the finance, design, build, and operation of aviation-compatible land uses in the form of an industrial business park on the site of the former Crows Landing Air Facility (Action Item No. 2006-776). **Figure 1B** depicts the former Crows Landing Air Facility property and the location of the Crows Landing Airport as envisioned by Concept 3.

Since 2007, the County has worked closely with area residents, members of the business community, and regulatory agencies to envision a GA airport that would meet the needs of the aviation community and complement the development of a regional employment center on the former military facility. A draft Airport Layout Plan (ALP) was developed and presented to the public during various community meetings from 2008 to 2014. Since then, the ALP has been modified to reflect suggestions offered by various stakeholders and to reflect changes in regional and national economic conditions. The proposed design, as described below, continues to reflect the reuse concept approved by the Board of Supervisors in 2006.

Airport Layout Plan

The purpose of this ALP report is to describe the requirements for the overall design of the Crows Landing Airport and present a recommended ALP drawing. The primary objective of this ALP is to document the extent, type, and approximate schedule of development needed to accommodate the opening of, and future aviation demand for, the Crows Landing Airport. The ALP will serve three major functions:

- The ALP will document existing aviation facilities at the former military facility and generally describe future development plans for the airport. This information will assist the County of Stanislaus, as the airport operator, in obtaining required approvals from various reviewing agencies, including the California Department of Transportation's Division of Aeronautics and the Stanislaus County Airport Land Use Commission. The ALP will also serve as the basis for subsequent Federal Aviation Administration (FAA) review, approval, and funding.

- The ALP will help the County make decisions on how best to operate and develop the airport to meet future demand.
- The ALP will serve as a basis for amending the Stanislaus County Airport Land Use Compatibility Plan (ALUCP) to include the Crows Landing Airport and its anticipated use as a GA facility.

This ALP report is organized into four chapters. Subsequent chapters provide the following information:

- **Chapter 2** presents aircraft activity forecasts for the proposed stages of airport development. The forecasts generally identify the fleet mix, number of based aircraft, and number of annual aircraft operations that would be accommodated under each stage of development. The forecasts are used to develop building area concepts and aircraft noise contours for the airport.
- **Chapter 3** describes three potential airfield and building area development plans for the airport: during its first 30 years of operation and beyond. The assumed facilities, services, and capabilities that would be associated with the airport at various milestones following its opening as a public-use GA facility are identified. Costs estimates for the various stages of development and for individual projects are also presented.
- **Chapter 4** presents the conceptual designs for the proposed Crows Landing Airport including the ALP drawing, an airspace plan drawing reflecting the ultimate runway configuration for the airport, and existing and ultimate aircraft noise contours. The ALP approval process is also described.

Appendices are included to present supporting materials, including a glossary of terms, a copy of the completed FAA ALP checklist, and a synopsis of the *Aircraft Owner Survey* completed in January 2006 for the proposed Crows Landing Airport. The report concludes with a complete set of ALP drawings.

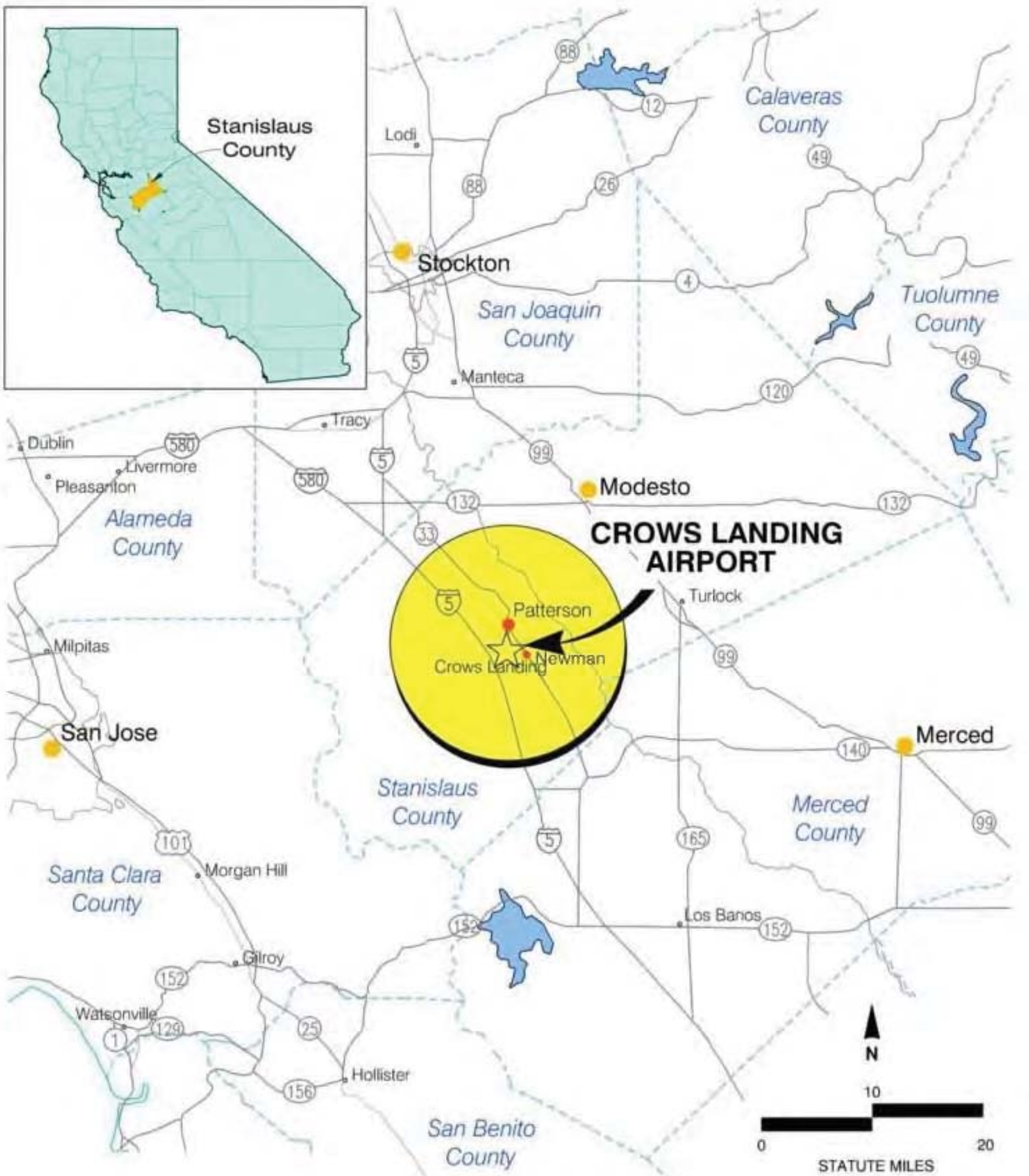


Figure 1A. Location Map

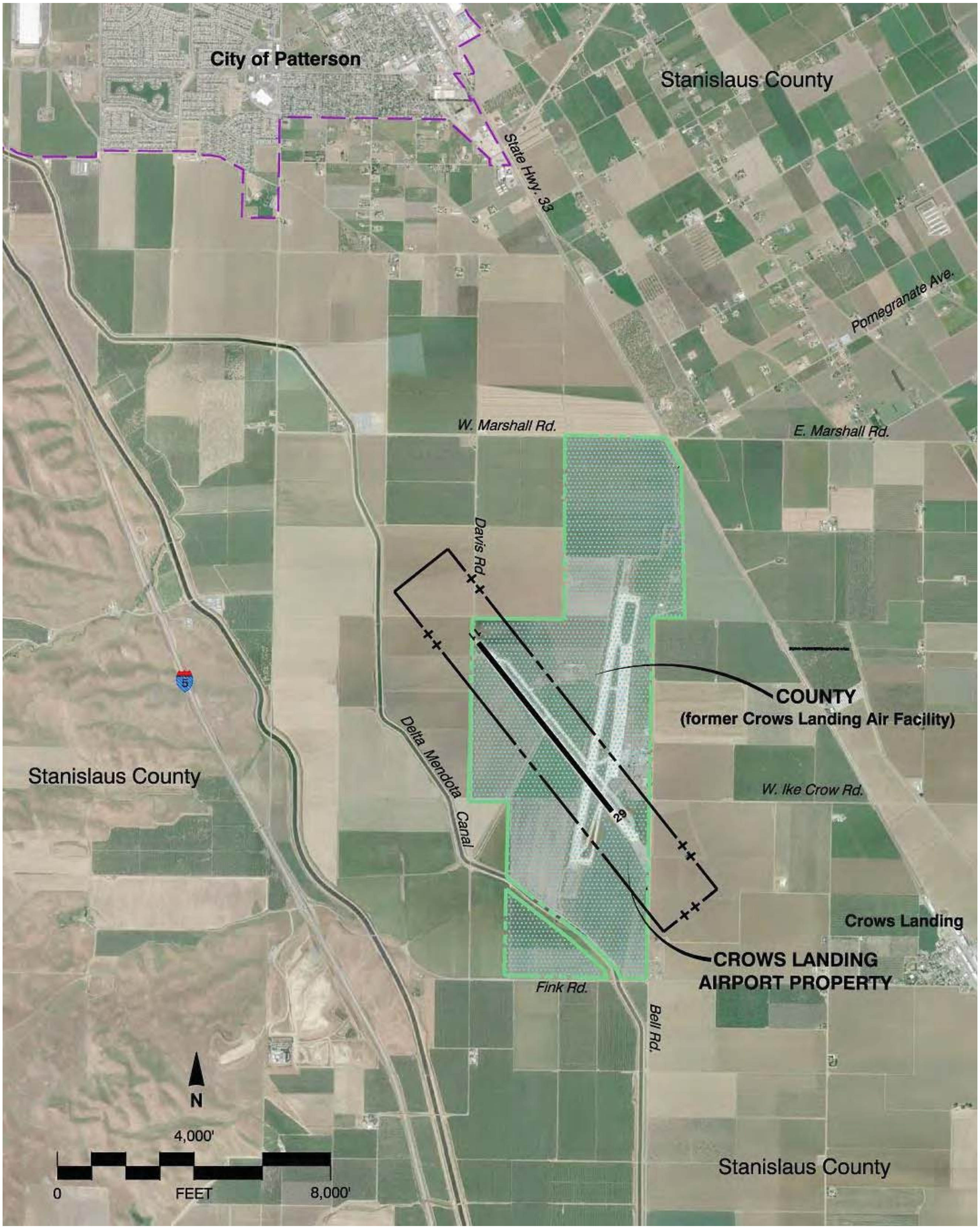


Figure 1B. Airport and Property Boundaries

CHAPTER 2

AIRPORT ROLE AND ACTIVITY FORECASTS

2

AIRPORT ROLE AND ACTIVITY FORECASTS

INTRODUCTION

Stanislaus County has designated the former Crows Landing Naval Air Facility as the Crows Landing Industrial Business Park (CLIBP). The County will develop a 370-acre portion of the 1,528-acre CLIBP as a general aviation (GA) airport. The primary market the County desires to serve is personal/recreational and business/corporate aircraft, while retaining the flexibility to accommodate commercial air cargo should demand warrant it in the future.

The aircraft activity forecasts developed for this ALP emphasize the airport's role as a public-use GA facility and its anticipated use by business aircraft associated with the adjacent industrial and business park. To provide operational flexibility, the proposed Crows Landing Airport would be sufficiently sized and equipped to readily accommodate small- to medium-sized air cargo/air freight feeder aircraft (e.g., Cessna Caravans, Beech 99s, Lear Jets, retrofitted twin-turboprop commuter aircraft, etc.). The airport's use by large air cargo aircraft is neither envisioned nor considered in this ALP report. **Figure 2A** presents the type of aircraft that would use the proposed Crows Landing Airport.

Forecasts of aeronautical activity at an airport are an essential component for both facility planning and environmental impact assessment. The two key forecast elements are based aircraft and annual airport operations (i.e., landings and takeoffs). The forecast of annual operations includes both local and itinerant operations. Local operations are those that remain in the immediate vicinity of the airport; such as flight training operations. Itinerant operations refer to departures that leave the airport vicinity or arrivals from outside the airport vicinity.

METHODOLOGY

The projection of historical trends is the most common method of forecasting activity at GA airports. Because the proposed Crows Landing Airport does not have an operating history as a public-use, general aviation airport, alternative methods have been employed to forecast aircraft operations. The FAA's *Aerospace Forecast* was used to define broad trends in regional and national general aviation activity. However, the FAA's forecast is of limited utility in a quantitative sense. Growth in aviation activity at the proposed Crows Landing Airport will be driven by the unique features of its location and the overall success of the CLIBP, which will include logistics, light industrial, and business park uses.

The relocation of aircraft from other airports will be the primary source of based aircraft growth in the early years; the initial forecasts have been developed by drawing inferences from experience with recent hangar development projects and historical examples of airport development at other airports (e.g., Contra Costa County's Byron Airport). Longer-term forecasts were principally shaped by assumptions about the nature of the adjacent industrial development and long-term regional and national general aviation growth factors.

Each forecast that follows is defined by the mix of facilities and services that would be available at each stage of development. These features are presented in greater detail in Chapter 3. Although these forecasts are tied to each stage of development described throughout this report (e.g., At Opening, Short-term, and Long Range. , it is more appropriate to think of these forecasts as linked to the specific facilities and services listed for each phase of airport development. The text that follows describes the factors used to shape the forecasts. The subsequent section presents the development scenarios and their associated forecasts. The activity forecasts are summarized in Table 2-1.

Based Aircraft

Growth in based aircraft will be determined initially by the number of aircraft that relocate from nearby airports. Experience has shown that people are generally willing to drive up to 30 minutes from their home or office to the airport where their aircraft are based. Specific circumstances can result in a willingness to drive longer distances, including:

- The absence of a suitable airport within a 30-minute drive,
- The absence of critical facilities or services at nearer airports (e.g., runway lights, instrument approach procedure, hangars, or Jet A fuel),
- Superior weather conditions,
- Closure of nearby airports (e.g., Patterson Airport and Turlock Air Park), and
- Significantly lower costs for fuel, hangars, etc.

The community nearest to Crows Landing Airport is the City of Patterson. Patterson is located approximately 4 miles north of Crows Landing Airport. The City's GA Airport closed in recent years the property has been designated for other uses. Several larger communities are within 30 minutes driving time of the airfield including: Tracy, Modesto and Merced. Based upon the most recent Airport Master Records for airports in the area (i.e., Tracy, New Jerusalem, Modesto, Turlock, Merced, Castle, Gustine, and Los Baños), about 579 aircraft are based at airports in the region surrounding Crows Landing Airport. Aircraft owners in those communities will likely consider moving to Crows Landing Airport if the quality and price of facilities and services provided are significantly superior to those offered at their current location or similar services are not available at their current location. Table 2-2 presents the facilities currently available at these nearby airports. The superiority of the facilities and services at Crows Landing Airport must outweigh the cost and inconvenience of driving to the airport. Therefore, the forecasts include explicit assumptions on the facilities and services that will be available at each stage of development. The forecasts also assume that the County will offer competitive prices for facilities and services provided at the Crows Landing Airport.

The January 2006, the County invited aircraft owners in the region surrounding the former Crows Landing Air Facility to participate in a survey (Aircraft Owner Survey). A summary of the completed survey is provided in Appendix C. Of the 55 responses received, 37 indicated a moderate to high level of interest in relocating to Crows Landing Airport. As could be expected, the interest in relocating to Crows Landing Airport was linked to the availability of facilities:

- 78% indicated that availability of self-serve general aviation gas was very important

- 73% indicated that availability of T-hangars was very important
- 62% indicated that airfield lighting was very important
- 36% indicated that availability of an instrument approach procedure was very important

Based on recent experience with hangar projects at various airports, it would be expected that 25% to 50% of those expressing interest would be willing to relocate. Therefore, if appropriate facilities were available at a competitive price, it is anticipated that 10 to 20 of the aircraft owners contacted would actually relocate. Residents of the communities of Patterson, Crows Landing, or Diablo Grande might acquire aircraft if Crows Landing Airport were available.

Aviation businesses are another potential source of based aircraft. Aviation businesses that provide flight training or charter services (collectively known as fixed-base operators or FBOs) are aviation businesses that are likely to have based aircraft. As with other aircraft owners, the attractiveness of the airport to these aviation businesses will depend upon the characteristics (e.g., availability of utilities, ability to use existing aprons and auto parking areas, proximity to markets) and price of leaseholds. The number of based aircraft and existence of other FBOs will also be factors affecting the attractiveness of Crows Landing Airport. No substantial aviation businesses are likely to base operations at Crows Landing Airport until runway lights are installed. Given the occurrence of fog, charter and fractional ownership operators are unlikely to base at the airport until there is an instrument approach that would provide at least ¾ mile visibility minimums, which will require some form of an approach lighting system. Some aviation businesses are unlikely to own aircraft, such as those that provide aircraft maintenance, painting, upholstery, and avionics.

The ongoing development of the Crows Landing Industrial Business Park is expected to generate some based aircraft. However, current trends in charter and fractional aircraft ownership suggest that many of the businesses in the proposed business park that use aircraft will not have an aircraft based at the airport. Instead, these businesses will utilize aircraft based at other airports that service them on a transient basis.

Most aircraft based at Crows Landing Airport would likely be single-engine, piston-powered aircraft. The based aircraft would be used largely for personal/recreational purposes. Given the limited facilities available in early years, these aircraft will principally be attracted by low prices. The availability of low-cost hangars will be a critical factor.

Aircraft Operations

An aircraft operation is defined as either a landing or a takeoff. A common training maneuver called a touch-and-go consists of a landing immediately followed by a takeoff without stopping. A touch-and-go counts as two operations. Operations at Crows Landing Airport will be generated by both based and transient aircraft. Operations are expected to be generated by:

- Flight training
- Trips by based aircraft
- Aircraft receiving services from FBOs

- Aircraft from other airports transporting passengers to/from Crows Landing Airport
- Law enforcement, emergency response, and utility patrol aircraft

Aircraft used for business purposes commonly have much higher utilization rates than aircraft used for personal purposes (e.g., recreational and personal business). Aircraft used in flight training also commonly have high utilization rates. An airport's utilization rate is typically expressed in terms of the annual operations per based aircraft. Based upon characteristics observed at other airports, the following ranges can be expected:

- An airport that does not have an FBO offering flight training or a significant number of based business aircraft will typically have a utilization rate of 100 to 200 annual operations per based aircraft.
- An airport that does not have an FBO offering flight training but does have significant number of based business aircraft will typically have a utilization rate of 200 to 400 annual operations per based aircraft.
- If a flight school is present at an airport or if an airport is regularly used for flight training by aircraft based at nearby airports, annual operations in the range of 400 to 500 operations per based aircraft are common.

The higher ends of the ranges are more likely to occur in metropolitan areas. Figure 2A illustrates representative aircraft in Airport Reference Codes B-II and C-II.

The annual operations forecasts associated with the 30-year planning horizon are summarized below. Additional detail is presented in Chapter 3.

At Opening Through Year 10

Opening/Year 1

- Based Aircraft = 10 (5 on tie-downs and 5 in basic privately-developed Port-A-Ports / hangars)
  - This is an optimistic number; 5 based aircraft is more realistic
  - All aircraft are likely to be single-engine, propeller airplanes
  - A few agricultural airplanes or a helicopter
- Total Annual Operations = 4,000 total operations
  - 1,000 operations by based aircraft
  - 3,000 operations, mostly touch-and-goes, by aircraft based at other airports

Year 5

- Based Aircraft = 15 (5 on tie-downs and 10 in basic privately-developed Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - Maybe a few multi-engine, propeller airplanes
  - Maybe a few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 6,000 operations

  - 1,500 operations by based aircraft. At this point the airport would start to see aircraft use linked to business activities in the adjacent industrial park and the FBO
  - 4,500 operations, mostly touch-and-goes, by aircraft from other airports

6 to 10 Years

- Based Aircraft = 20 (5 on tie-downs and 15 in Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - A few multi-engine, piston airplanes
  - One or two turbine-powered aircraft (turboprops and/or jets)
  - A few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 8,000 operations
  - 3,000 operations by based aircraft and transient aircraft providing transportation for passengers associated with the industrial and business park
  - 5,000 operations, mostly touch-and-goes, by aircraft from other airports

Future Development

11 to 20 Years

- Based Aircraft = 40 (5 on tie-downs and 35 in Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - A few multi-engine, piston airplanes
  - A few turbine-powered aircraft (turboprops and/or jets)
  - A few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 16,000 operations
  - 11,000 operations by based aircraft and transient aircraft providing transportation for passengers associated with the industrial and business park
  - 5,000 operations, mostly touch-and-goes, by aircraft from other airports

21 to 30 Years

- Based Aircraft = 80 (15 on tie-downs and 65 in Port-A-Ports / hangars)
- Total Annual Operations = 34,000 operations
  - 15,000 annual touch-and-goes by aircraft based at the airport
  - 8,500 operations by jet and turboprop aircraft

Aviation Forecast Summary

Aviation is subject to economic conditions, and the overall growth of general aviation is expected to be slow in the years ahead. Business/corporate use of general aviation aircraft is anticipated to continue to be the strongest sector of the general aviation industry, but even this segment of aviation is subject to economic conditions. National trends indicate that business/corporate aviation is using more sophisticated, turbine-powered aircraft. Crows Landing Airport is well positioned to serve business/corporate aircraft that are high-performance, single-engine airplanes, light to medium twin-engine aircraft, and corporate jets. The airport is likely to benefit from some of the projected growth in business/corporate use of the general aviation aircraft fleet. Additionally, a new class of advanced, small-turbine-powered jet aircraft is emerging in the general aviation industry. This small personal/business jet aircraft would be capable of operating on shorter runways (approximately 3,000 feet in length). Introduction of this class of jets could further enhance projected general aviation jet activity at Crows Landing Airport. Personal/recreational general aviation uses are also anticipated to become a large component of the airport's future based aircraft.

The proposed Crows Landing Airport is well suited to accommodate future increases in based aircraft and aircraft operations volumes. The airport is not seriously constrained with respect to airfield or building area capacities. The proposed Crows Landing Industrial Business Park will be developed with aviation-compatible uses, such as light industry, logistics, and government offices, and the adjacent property uses are agricultural. The number of projected future aircraft operations at Crows Landing Airport is not a major factor in the planning or design of improvements. The proposed runway/taxiway system is more than adequate to meet projected activity levels for the airport. In terms of building area capacity, the proposed Crows Landing Airport has approximately 132 acres available at build-out for future aviation-related development.

Table 2-1. Activity Forecasts

Forecast	Opening	Year 5	Year 10	Year 20	Year 30
Based Aircraft					
Aircraft Type	**(Number of Aircraft by Type)**				
Single-Engine, Piston	10	13	15	25	50
Twin-Engine, Piston	0	2	2	5	10
Turboprop	0	0	2	7	14
Jets	0	0	1	3	6
Total Based Aircraft	**10**	**15**	**20**	**40**	**80**
Storage Demand		**(Number of Spaces or Aprons Required)**			
Hangar Spaces	5	10	15	35	65
Aprons	5	5	5	5	15
Total Aircraft	**10**	**15**	**20**	**40**	**80**
Annual Aircraft Operations					
Aircraft Mix		**(Number of Operations by Aircraft Type)**			
Single-Engine, Piston Fixed-Pitch Prop	4,000	5,500	6,500	10,500	22,000
Twin-Engine, Piston		350	600	1,500	3,500
Turboprop		100	600	2,500	5,000
Jets		50	300	1,500	3,500
Total	**4,000**	**6,000**	**8,000**	**16,000**	**34,000**
Annual Aircraft Operations		**(Number of Operations)**			
Local	3,000	4,000	5,000	7,000	15,000
Itinerant	1,000	2,000	3,000	9,000	19,000
Total	**4,000**	**6,000**	**8,000**	**16,000**	**34,000**

Table 2-2
Area Airports
(Crows Landing Airport Vicinity)

Airport Name	Owner	Location: Community/County	Location: Distance[1]/Direction	Location: Based Aircraft	Facilities: Number of Runways	Facilities: Longest Runway (ft.)	Facilities: Surface[2]	Facilities: Lighted-Intensity[3]	Facilities: Approach Visibility[4] / Category	Services: Control Tower	Services: Airline Service	Services: AvGas	Services: Jet Fuel	Services: Maintenance	Services: Automobile Rentals	Services: Food
AREA AIRPORTS																
Castle	Merced County	Merced/ Merced	32	76	1	11,802	ASPH/ CONC	H	ILS/LOC/ VOR/DME/ GPS	√	-	√	√	√	-	-
Gustine	City of Gustine	Gustine/ Merced	11	23	1	3,200	ASPH	M	VIS	-	-	√	-	√	-	-
Los Banos	City of Los Banos	Los Banos/ Merced	24	34	1	3,800	ASPH	M	VOR/DME/ GPS	-	-	√	√	√	-	√
Merced Municipal	City of Merced	Merced/ Merced	29	111	1	5,903	ASPH/ POR	H	GPS/ILS/ VOR/DME	-	√	√	√	√	√	√
Modesto City-County	City of Modesto	Modesto/ Stanislaus	17	182	2	5,911	ASPH	M	ILS/LOC/ VOR/DME/ GPS	√	√	√	√	√	-	-
New Jerusalem	City of Tracy	Tracy/ San Joaquin	20	77	1	3,530	ASPH	-	VIS	-	-	-	-	-	-	-
Turlock	City of Turlock	Turlock/ Merced	23	64	1	2,985	ASPH	-	VIS	-	-	√	-	-	-	-

[1] Distance in statute miles from Crows Landing Airport
[2] ASPH=asphalt; CONC=concrete; POR=Porous Friction Coat
[3] L=low; M=medium; H=high
[4] Statute mile NP=Nonprecision; VIS=visual; ILS=Instrument Landing System; LOC=Localizer; VOR=Very High Frequency Omnidirectional Range; DME=Distance Measuring Equipment; GPS=Global Positioning System

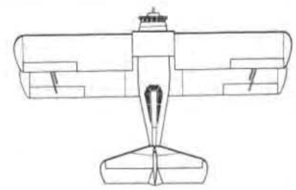
Figure 2A. Representative Aircraft

ARC B-II and Smaller

Flight Design CTSW
Light Sport Aircraft
Fastest selling light sport aircraft
Seats: 2
Wingspan: 28'
Max. Cruise Speed: 112 kts
Gross Weight: 1,320 lbs.

Cirrus SR22
Small, Single-Engine Aircraft
Equipped with aircraft parachute
Seats: 4
Wingspan: 38'4"
Max. Cruise Speed: 185 kts
Gross Weight: 3,400 lbs.

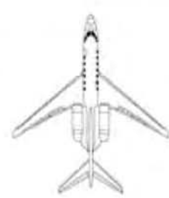
Grumman Ag Cat
Single-Engine Biplane
Agricultural aircraft
Seats: 1
Wingspan: 35'11"
Max. Cruise Speed: 128 kts
Gross Weight: 4,500 lbs.



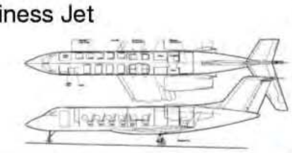
Citation II
Small Business Jet
Light corporate jet
Seats: 10 total
Wingspan: 52'3"
Max. Cruise Speed: 403 kts
Gross Weight: 15,100 lbs.

ARC C-II

Citation X
Fast, Medium-Sized Business Jet
Fastest business jet in history
Seats: 12 and 2 flightcrew
Wingspan: 63'11"
Max. Cruise Speed: 504 kts
Gross Weight: 35,700 lbs.



Gulfstream III
Long-Range, Mid-Sized Business Jet
2 Rolls Royce turbofans
Seats: Up to 19 & 2 flightcrew
Wingspan: 77'10"
Max. Cruise Speed: 460 kts
Gross Weight: 73,200 lbs.



CHAPTER 3

AIRPORT DEVELOPMENT CONCEPTS

3 AIRPORT DEVELOPMENT CONCEPTS

INTRODUCTION

Chapter 3 presents a staged development plan for the airfield and building area at the Crows Landing Airport. The staging plan reflects the project development priorities and schedules for three planning periods:

- **At Opening: 0 to 10 Years**
- **Future Development: 11 to 30 Years**
- **Ultimate Build-out Concept: >30 Years**

The focus of this ALP is on providing direction for the appropriate types of facilities necessary for the initial start-up and intermediate development of the Crows Landing Airport during its first 30 years of operation. Recommendations are limited to a basic development framework that emphasizes the airfield requirements and site suitability for various uses (e.g., hangars, internal access roads, navigational aids, etc.). **Table 3-1,** *Airport Development Concepts,* and **Table 3-2**, *Airport Design,* which are provided at the end of this chapter, describe the types of facilities envisioned for each of the three planning phases. Conceptual layouts of airport facilities are provided for illustration purposes in **Figures 3A** through **3C**.

A detailed layout of most future development (i.e., Short-Term and Long-Term) within the core building area is not included in this report as the siting of these facilities will be driven by demand and other factors (e.g., public road access to the airport, funding, etc.). Follow-up planning and engineering studies will be required to expand upon the basic framework presented in this ALP.

AIRPORT DEVELOPMENT OVERVIEW

The conceptual development plan for Crows Landing Airport is described below. The factors affecting the siting and development of future airport facilities and the specific design requirements applicable to Crows Landing Airport are discussed in subsequent sections of this chapter.

At Opening: 0 to 10 Years

Approximately 370 acres of the former Crows Landing Air Facility property will be used for a GA airport. The new Crows Landing Airport will open for public use as a very basic/visual approach, day-use-only general aviation facility that would support Airport Reference Code ARC B-II (small) aircraft (up to 12,500 lbs.). A portion of the existing concrete pavement remaining from runways and taxiways at the former Crows Landing Air Facility will be rehabilitated and serve as a new runway/taxiway system and building area.

The former northwest/southeast runway (Runway 11-29) will be remarked as a ~~5,300~~ 5,175-foot-long by 100-foot-wide runway. Initially, the runway will be unlighted and available for daytime use only. Visual approach aids will be provided, such as a segmented circle and three unlighted wind socks. The former parallel taxiway system for Runway 11-29 will also be retained, as the separation distance between the runway and parallel taxiway satisfies FAA design standards for an ARC B-II (small) runway and taxiway. Inline (or lead-in) taxiways will provide access to and from the new runway thresholds. Standard right-angle runway entrance taxiways will be provided later as funding becomes available.

A portion of the former north/south runway (Runway 16-34) and apron area located northeast of Runway 11-29 will serve as the airport's core building area. Initial development is anticipated to use existing pavement to the greatest extent practicable. The building area will provide space for a small aircraft parking apron accommodating five aircraft tie-downs and ten hangars, and an airport operations office with restrooms and a telephone. Aircraft hangars are anticipated to be provided by the private sector on property leased from the County. To prevent inadvertent entry to the airport, a perimeter fence will be provided to separate the airport from the adjacent industrial business park development. A manual gate will provide controlled access to the Airport from West Ike Crow Road. To make the airport attractive to new users, aviation gas (100LL) will be provided using a self-service/skid- mounted/above-ground storage tank that would be located on existing pavement near the airport operations office. If required, Jet-A fuel would likely be dispensed by a refueler truck, but jet fuel facilities are likely to occur in subsequent development stages. A wash rack will also be provided. • The future fuel station and wash rack are planned to be located immediately adjacent to one another in an effort to share a common filtration system. The initial planning, design, and operational tasks that must be completed prior to opening the Airport are identified in Chapter 4, Table 4-2.

Future Development: 11 to 30 Years

In this phase of development, minimal structural modifications to the runway/taxiway system are envisioned. The principal change will be the addition of runway lighting and navigational aids, as well as upgraded runway markings to reflect non-precision instrument approach capabilities. It should be noted that a non-precision GPS-based instrument approach does not require on-the- ground support facilities. Lighting and navigational aids include medium-intensity runway edge lights (MIRL), precision approach path indicator (PAPI), runway end identifier lights (REIL), and a rotating beacon. The three wind cones installed during the first five years also will be lighted. A description of these facilities is provided later in this chapter in the discussion of Other Runway Features.

A 3-acre area will be reserved on the southeast side of the airport to provide a heliport facility. Initially, the heliport will include a helicopter takeoff and landing area which will utilize existing airfield pavement. Other support facilities, such as helicopter parking and/or a fixed-base operator (FBO) facility, may require additional pavement depending on the heliport layout and design.

This phase of development also includes the construction of a perimeter access road. Initially, only a segment of the perimeter road would be needed to provide access between the northeast building area and the heliport and perhaps direct access to the heliport from Bell Road. Eventually, as the southwest building area is developed, a complete perimeter road would be advantageous to provide airport tenants, fuel trucks, and airport personnel with uninterrupted passage between the northeast and southwest building areas.

Building area development is anticipated to include:

- **New apron to accommodate additional aircraft parking and/or an FBO:** Additional apron pavement will likely be needed to accommodate additional based aircraft (five additional hangars or tie-downs) and/or a FBO facility. The transient tie-down apron located near the operations office can be relocated if a FBO desires to site its facilities on the existing pavement near the airport entrance. If this occurs, the taxiway system would need to be reconfigured. **Figure 3B** reflects this design.
- **Lighting and navigational aids:** Airport lighting facilities are presented in the discussion of Visual Approach Aids that appears later in this chapter.

Ultimate Build-out: >30 Years

The principal change occurring in this phase of development is a proposed runway extension that would lengthen Runway 11-29 from 5,175 feet to 6,175 feet. The runway/taxiway system would be upgraded during this phase to accommodate ARC C-II aircraft, and to provide precision instrument approach capabilities. These upgrades will require:

- Acquiring 202 acres, of which approximately 200 acres are within the existing approach protection easement.
- Constructing a 1,000-foot extension of Runway 11 to the northwest and blast pad.
- Realigning a portion of Davis Road to keep all runway clear areas on airport property.
- Constructing a new parallel taxiway and apron area on the southwest side of the runway to satisfy FAA separation requirements.
- Upgrading the runway markings to reflect precision instrument approach capabilities and installing an approach lighting system(s).
- Relocating and providing additional fencing.
- Providing 90-degree taxiway entrance/exits to the runway ends.
- Relocating all structures that do not satisfy the setback requirements for an ARC C-II runway.

Expansion of the airport building and apron areas is anticipated to accommodate additional based and transient aircraft as well as FBO facilities. Development of the southwest building area and enhancement of the heliport facilities are also anticipated. Details associated with the facility layout will depend on demand and available funding.

AIRPORT DESIGN FACTORS

The FAA establishes extensive standards pertaining to all aspects of airport design. These standards vary depending upon the characteristics of the critical aircraft anticipated to use the facility regularly and the airport's specific operating conditions (e.g., elevation, average maximum temperature, prevailing wind direction, type of approach).

Airport Classification and Design Aircraft

FAA airport design standards are set in accordance with an Airport Reference Code (ARC) that may apply to the airport as a whole or Range to an individual runway or taxiway (FAA Advisory Circular 150/5300-13, Airport Design). The primary determinants of ARC classifications are the approach speed and wingspan of the most demanding types of aircraft expected to operate regularly at the airport, together with the type of instrument approach capability associated with the runway.

As described in Chapter 2, Airport Role and Activity Forecasts, the majority of airport operations would be generated by small single-engine, piston aircraft. However, within the short-term planning period, the most demanding class of aircraft expected to use the airport regularly, as defined by the FAA as more than 500 annual operations, is the medium-sized, twin-engine, turbo-prop aircraft, such as the Beechcraft Super King Air B200. Ultimately, the most demanding class of aircraft anticipated to operate at Crows Landing Airport is business/corporate jets.

For facility planning purposes, the following ARCs and design aircraft were used to identify facility needs for the Crows Landing Airport:

- **At Opening** : ARC B-II (small), Beechcraft Super King Air B200 (103 knots approach speed, 12,500 pounds maximum takeoff weight, 54.5-foot wingspan, 43.8 feet in length).
- **Ultimate Build-out (>30 years)**.: ARC C-II, Gulfstream III (136 knots approach speed, 68,700 pounds maximum takeoff weight, 77.8 foot wingspan, 83.1 feet in length.

Airport Reference Code Criteria

Approach Category	Approach Speed Range	
A	<91 kts	
B	≥91 kts	<121 kts
C	≥121 kts	<141kts
D	≥141 kts	<161 kts
E	≥166 kts	
Design Group	**Wingspan Range**	
I	<49 feet	
II	≥49 feet	<79 feet
III	≥79 feet	<118 feet
IV	≥118 feet	<171 feet
V	≥171 feet	<214 feet
VI	≥214 feet	<262 feet

ARC B-II Aircraft
Beechcraft Super King Air B-200
Twin-turboprop, seats 6-10, includes most business/corporate turboprop aircraft.

ARC C-II Aircraft
Gulfstream III
Business jet/medium cabin, seats 4-10, includes commercial regional jet aircraft.

Wind Coverage

Strong winds at an airport can pose airfield and building design concerns. Wind conditions affect all airplanes in varying degrees. Generally, the smaller the airplane, the more it is affected by wind, particularly crosswind components.

Ideally, a runway should be aligned with the prevailing wind to allow a pilot to land and takeoff into the wind. FAA guidelines establish that the orientation of an airport's runways should enable the airport to be usable, with crosswinds at an acceptable velocity, during at least 95% of the year. Airports with lower annual wind coverage can qualify for FAA funding to construct a crosswind runway. The criteria for an acceptable crosswind velocity are tied to the runway's ARC and to the type of aircraft using the runway. Small, light aircraft are more affected by strong crosswinds than larger, heavier planes. For small planes, the FAA considers a 10.5 knot crosswind to be the maximum acceptable, whereas heavy jets can tolerate crosswinds up to 20 knots.

*A **Wind Rose** is a meteorological diagram depicting the distribution of **wind** direction and speed at a specific location over a period of time.*

***Visual flight rules (VFR)** are a set of aviation regulations under which a pilot may operate an aircraft, if weather conditions are sufficient to allow the pilot to visually control the aircraft's* attitude*, navigate, and maintain separation with obstacles such as terrain and other aircraft.*

***Instrument flight rules (IFR)** are a set of regulations and procedures for flying aircraft without the assumption that pilots will be able to see and avoid obstacles, terrain, and other air traffic; it is an alternative to visual flight rules (VFR), where the pilot is primarily or exclusively responsible for see-and-avoid.*

In terms of design aircraft parking aprons, aircraft operators generally prefer to park their aircraft nose-forward into the wind. Aircraft pointed into the wind are far less likely to suffer control surface damage from wind gusts (i.e., gusts striking the aircraft from the sides or the rear are capable of overstressing/bending critical aircraft control surfaces). Other advantages include faster cooling down of aircraft engines and preventing engine fumes from entering the cabin.

RUNWAY DESIGN

The basic design factors and requirements associated with an airport runway system are described in the following paragraphs. The airfield design features for each development phase associated with the Crows Landing Airport are summarized in **Table 3-2**.

Runway Configuration

The former Crows Landing Air Facility had two intersecting runways: Runway 16-34, which was aligned in a north/south direction, and Runway 11-29, which was oriented in a northwest/southeast direction. In 2006, the County decided to retain Runway 11-29 for its new GA airport. The concrete runway associated with the former Crows Landing Air Facility is sufficient to accommodate the load-bearing weight of ARC B-II (small) and C-II aircraft envisioned to use the new Crows Landing Airport. The runway is in usable condition, but weed removal, crack filling, and marking are necessary. The surfaces are reasonably smooth with some uniform unevenness over the entire surface, but no serious dips or humps are present. Concrete damage is restricted to cracking at the corners of relatively few slabs. Runway 11-29 is aligned with the prevailing wind direction from the northwest.

Runway Length

The length of the runway required to accommodate the most demanding airplanes anticipated to use the airport is a fundamental factor of airfield design. Runway length requirements for specific aircraft depend upon the airfield elevation and design temperature (the average high temperature for the hottest month). For several categories of small aircraft, the FAA has established formulas to identify the desirable runway length. For large aircraft, this data is available in performance charts provided by aircraft manufacturers.

The Crows Landing Airport is located in the northwestern part of the San Joaquin Valley at an elevation of 156 feet above mean sea level (MSL). The Airport is situated approximately 10 miles east of the Diablo Range and 80 miles east of the Sierra Nevada Foothills. The mean maximum temperature of the hottest month (July) is 96.6 degrees Fahrenheit.[1] Based on this data, the FAA's program indicates that a runway length of less than 5,000 feet would be sufficient to accommodate all small aircraft weighing less than 12,500 pounds. Larger, heavier aircraft (>12,500 pounds.) would require a longer runway. The specific runway length requirements for Crows Landing Airport are:

- **At Opening through Year 30:** runway length is 5,175 feet
  - Length is suitable to accommodate all small general aviation aircraft and some use by large aircraft; and
  - All runway critical areas (runway safety and objected free areas) remain on airport property.
- **Ultimate Build-out (>30 years):** runway length is 6,175 feet
  - Length is sufficient to accommodate most of the small-to-medium sized business jets within in ARC C-II.
  - The acquisition of 202 acres off the ends of the runway and the realignment of a portion of Davis Road and Bell Road will be necessary to allow the runway critical areas to remain on airport property and under County control.

Runway Width

FAA runway width design standards consider both the airport's ARC designation and the visibility conditions under which aircraft operate (visual, visibility minimums of <¾ statute mile). Generally, fast-moving aircraft operating during reduced visibility conditions require wide runways to ensure that sufficient hard surface is available for safe landing and takeoff. The runway width design standards for ARC B-II (small) and C-II are presented in the Runway Width Criteria table.

Runway Width Criteria

Visibility*	ARC B-II (small)	ARC C-II
Visual or ≥ 3/4 mile	75	100
< 3/4 mile	100	100

** Visibility minimums in statute miles*

For the Crows Landing Airport, the runway width is designed at 100 feet as existing runway pavement from the former Crows Landing Air Facility is available and in good condition. This runway width surpasses the minimum FAA requirements for ARC B-11 aircraft, which are anticipated to use the airport during its first ten years of operation.

[1] *Western Regional Climate Center* - for Newman Station 8 miles south

Runway Safety Areas

Runway Safety Areas (RSAs) are graded areas situated along the sides and ends of runways. RSAs must be clear of objects, except those that must be located near the runway because of their aeronautical function. Under dry conditions, the area must be capable of supporting emergency equipment and the occasional passage of an aircraft without causing structural damage to the aircraft. Consistent with FAA design standards, the RSA for Crows Landing Airport is:

- **At Opening and Future Development:** 150 feet wide and 300 feet beyond the runway ends
- **Ultimate Build-out:** 500 feet wide and 1,000 feet beyond the runway ends

Object Free Areas

Object Free Areas (OFAs) also surround runways and must be clear of nonessential objects including parked airplanes. The major difference between these two critical areas is that the grading criteria for RSAs do not apply to OFAs. For example, ditches can be located in an OFA. Also, aircraft may taxi or hold within an OFA, but not an RSA. The length of the OFA beyond the ends of the runway is identical to the requirements of an RSA or can be extended to the end of the runway protection zone. The OFA width, however, is based on the airport's ARC designation and approach visibility minimums. The OFA width dimensions applicable to Crows Landing Airport are presented in the adjacent table.

Object Free Area (OFA) Width

Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	500'	800'
< 3/4 mile	800'	800'

** Visibility minimums in statute miles*

Obstacle Free Zones

A third critical area surrounding a runway is the Obstacle Free Zone (OFZ). OFZs are three-dimensional—consequently, short objects may be acceptable in places where taller objects may not be acceptable. Only frangible, mounted navigational aids are allowed to penetrate an OFZ. Other objects, including taxiing or parked airplanes, are not permitted. Consistent with FAA standards, the OFZ for Crows Landing Airport is 400 feet wide and extends 200 feet beyond the ends of the runway for all three development phases.

Runway Protection Zone

A runway protection zone (RPZ) is a trapezoidal area beginning 200 feet beyond the end of the runway. The purpose of the RPZ is to enhance the protection of people and property on the ground, and this is achieved when the airport owner maintains control over land within its RPZs. Such control includes clearing and maintaining RPZ areas to be free of incompatible objects and activities.

Control over the RPZ is best exercised through the acquisition of sufficient property interests in the RPZ. The RPZ dimension is a function of the type of aircraft and approach visibility minimum associated with that runway end. Consistent with FAA design standards, the RPZ dimensions for Crows Landing Airport are:

- **At Opening and Future Development:** 250 feet inner width, 450 feet outer width, and 1,000 feet in length
- **Ultimate Build-out:** 1,000 feet inner width, 1,750 feet outer width, and 2,500 feet in length

Building Restriction Line

The building restriction line (BRL) establishes the closest location in which buildings can be placed relative to a nearby runway or, in some cases, a primary taxiway. The FAA no longer defines a specific BRL setback distance standard, but it provides guidance on factors to be considered in determining the BRL location.

The location of the BRL is determined in large part by the necessary setback distances from the runway and taxiway system. An additional consideration is the need to provide sufficient vertical clearance over fixed or movable objects (e.g., buildings, parked or taxiing aircraft). Vertical clearance requirements are established in accordance to Federal Aviation Regulations (FAR) Part 77, *Safe, Efficient Use and Preservation of the Navigable Airspace*, which identifies the airspace necessary for navigation. The airspace requirements applicable to Crows Landing Airport are provided in Chapter 4, *Airport Plans*.

For the Crows Landing Airport, the BRLS were established to accommodate anticipated development during the three development phases (Opening, Short-term, and Long-Range). The primary building area, which will accommodate initial airport development, is located northeast of Runway 11L-29R.

- **At Opening and Future Development (0 to 30 years):**
  - BRL B-II: 15-foot vertical clearance is located 355 feet from the runway centerline
  - BRL B-II: 30-foot vertical clearance is located 460 from the runway centerline
- **Ultimate Build-out (>30 years):**
  - BRL C-II: 15-foot vertical clearance is located 605 feet from the runway centerline
  - BRL C-II: 30-foot vertical clearance is located 710 from the runway centerline

To minimize the future expense of relocating structures, permanent airport facilities (e.g., buildings, fueling facility) should be located in the areas farthest from the runway to meet ARC C-II setback requirements. Temporary objects or semi-permanent structures (e.g., portable hangars, tiedown aprons) are suitable for the areas defined by the BRLs for ARC B-II (small).

Other Runway Features

Blast Pads

Blast pads consist of light-duty pavement situated beyond the ends of runways. They serve to minimize erosion and the blowing of dirt and debris from unprotected ground that result when aircraft, particularly jets, apply full power to initiate takeoff. Although paved, blast pads are not usable by aircraft under normal circumstances and are not included in the runway length.

In the early phases of development, blast pads are not needed as minimal jet activity is anticipated. Once the runway is upgraded to an ARC C-II facility, the existing concrete pavement leading up to the Runway 29R threshold would be marked as a blast pad. New blast pads would be constructed at the other runway ends during the Long-Range development phase.

Marking

The pavement remaining from the Crows Landing Air Facility is more extensive than what is needed for the new general aviation facility. Therefore, together with the pavement resurfacing, the new runway threshold bars, chevrons, edge striping, and shoulder marking will serve to delineate the reduced length and width of the runway. The runway marking will be upgraded as instrument approaches capabilities are provided (e.g., non-precision and precision). Figures 3A through 3C reflect the following different runway marking standards:

- **At Opening (Year 0 to 10):** Basic runway markings reflecting a runway with no straight-in instrument approach procedures.
- **Future Development (Years 11 to 30):** Non-precision runway markings reflecting straight-in instrument approach procedures providing horizontal guidance only.
- **Ultimate Build-out (>30 Years):** Precision runway markings reflecting straight-in instrument approach procedures providing horizontal and vertical guidance.

Visual Approach Aids

The visual approach aids described below are envisioned for development at the Crows Landing Airport after the first ten years of operation as demand warrants.

- **Runway edge lights.** Runway edge lighting is designed to show the width and length of the usable landing area; there are two rows of lights—one row on each side of the runway—that extend along the length of the runway. These light systems are classified according to the intensity they are capable of producing. For the Crows Landing Airport, Medium Intensity Runway Lights (MIRL) or High Intensity Runway Lights (HIRL) are anticipated. These lights can be part of a Pilot-Controlled Lighting (PLC) system, which allows a pilot to turn on an airport's runway edge, approach, and taxiway lights via radio. PLC systems are most common at non-towered or infrequently used airfields where it is not economical to light the runways all night or to provide staff to turn the lights on and off.
- **Precision Approach Path Indicator (PAPI).** A lighting system positioned beside the runway that consists of two, three, or four boxes of lights to provide a visual indication of an aircraft's position on the glidepath for the associated runway. The PAPI is usually located on the left side of the runway

and can be seen from distances of up to 5 miles during the day and 20 miles at night.

- **Approach Lighting System (ALS).** A lighting system installed on the approach end of an airport runway that consists of a series of lightbars, strobe lights, or a combination of the two, and extends outward from the runway end. An ALS usually serves a runway that has an associated instrument approach procedure (IAP), upon arrival and it allows the pilot to visually identify the runway environment upon arrival at a prescribed point on an approach. A medium- intensity approach lighting system with runway alignment indicator lights (MALSR) is proposed for Crows Landing Airport. The light bars, spaced 200 feet apart, extend outward to a distance of 2,400 feet from the runway ends.

- **Runway end identifier lights (REIL).** Lights installed at many airports to provide rapid and positive identification of the approach end of a particular runway. The system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold.

- **Rotating Beacon.** A device used to assist pilots in finding an airport, particularly those flying in visual flight rules (VFR) at night. A standard green-and-white rotating beacon is proposed for construction near the airport's entrance during the short term.

- **Wind indicator.** A windsock or wind cone is a conical textile tube designated to indicate wind direction and relative wind speed. Per FAA standards (FAA Advisory Circular 150/5345-27D), a 15-knot (17-mph) wind will fully extend the windsock. A 3-knot (3.5-mph) breeze will cause the windsock to orient itself according to the wind. At many airports windsocks are lighted at night, either by flood lights on top surrounding it or with one pole-mounted light that shines inside the wind sock.

  Three unlighted wind cones will be provided initially at the Crows Landing Airport as the airport will be used only during the day. The primary wind cone is collocated with the segmented circle at midfield. Two others are found near the approach ends of Runways 11 and 29. Lighted wind cones will be provided when runway lighting becomes available.

- **Segmented circle.** A segmented circle is used to aid pilots determine takeoff and landing information at an airport. The optimum location for the segmented circle is midfield. This centralized location enables pilots to locate the segmented circle easily.

Electronic Navigational Aids

> ***Global Positioning System**. A system of satellites that allows one's position to be calculated with great accuracy by the use of an electronic receiver.*

Electronic navigational aids (NAVAIDs), in particular instrument approach aids, are an important operational element of any public-use airport. NAVAIDs facilitate user access to and fromthe airport during inclement weather conditions. To be fully effective, the NAVAIDs must be complemented by airfield improvements such as an appropriate runway lighting system, runway markings, and signing. It is anticipated that the Crows Landing Airport will initially open for public-use with a basic GPS-based Non-Precision Instrument Approach (NPIA) serving each of the two runway ends. Such NPIAs would likely have approach minimums of 1 statute mile visibility and a 400-foot ceiling. As the Airport and its airfield components are expanded and improved, it is anticipated that the Airport's runway will be served by multiple GPS-based Precision Instrument Approaches (PIA) with approach minimums of ½ statute mile visibility and a 200-foot ceiling.

TAXIWAYS

Taxiways provide the links by which aircraft travel between runways and parking facilities in the airport building area. At the Crows Landing Airport, this system will consists of major taxiways parallel to the runway and with various secondary taxiways to provide access to parking aprons and hangar areas.

Taxiway Design

Taxiway Hold Line Distance

Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	200'	250'
< 3/4 mile	250'	250'

** Visibility minimums in statute miles*

In the early phases of development (At Opening and Short-Term), the taxiway system will utilize the pavement remaining from the former Crows Landing Air Facility. The taxiways will be centered on the existing pavement and marked to reflect a 35-foot wide taxiway, consistent with FAA design standards for ARC B-II (small) and C-II runways. Hold lines, as required by FAA standards, will be marked on each exit taxiway which intersects with the runway. The hold lines will be marked 200 feet from the runway centerline, consistent with the standards applicable to an ARC B-II (small) runway. The hold line will be remarked 250 feet from the centerline once the runway is upgraded to an ARC C-II facility or precision instrument approach capabilities are provided (i.e., <3/4 statute mile visibility). The future taxiways can be equipped with medium-intensity taxiway lighting and/or reflectors at the same time the runway lighting is installed.

Taxiway Designations

Taxiways are generally labeled with letters of the alphabet in accordance with criteria outlined in FAA Advisory Circular 150/5340-18C, Standards for Airport Sign Systems. The parallel taxiway along the northeast side of Runway 11-29 and the exit taxiway serving the approach end of Runway 29 will be designated Taxiway A. The four 90-degree exit taxiways angling from the middle section of Runway 11-29 will be designated A1, A2, A3, and A4 as they progress southward.

Runway-to-Taxiway Separation

For runways classified as ARC B-II (small), the FAA standard for runway- to-parallel taxiway separation is 240 feet. Based on this alignment, the separation distance between the runway and taxiway is 288 feet. When either the Airport's instrument approach capabilities or ARC classification is upgraded, the separation distance will need to increase to meet the FAA's design standards noted in the adjacent table.

Runway-to-Taxiway Separation		
Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	240'	300'
< 3/4 mile	300'	400'

** Visibility minimums in statute miles*

Taxiway Object Free Area

Similar to the runway object free area (OFA), the taxiway OFA clearing standards prohibit service vehicle roads, parked airplanes, and aboveground objects, except those needed for air navigation or ground maneuvering. In combination with meeting FAR Part 77 requirements, the taxiway OFA is often used to establish the Aircraft Parking Limit (APL) line. APLs define the areas which are appropriate for parking of aircraft.

As designed, the distance from the centerline of Taxiway A to adjacent aircraft parking positions is approximately 67 feet. This amount of wingtip clearance is ample for the anticipated mix of aircraft using the airport. It meets FAA standards for ARC B-II (small) and C-II aircraft (i.e., aircraft with wingspans up to 79 feet, such as a Gulfstream III).

Signage

FAA standards for airfield signage are set forth in Advisory Circular 150/5340-18C, *Standards for Airport Sign Systems*. These standards mandate the installation of certain instructional signs at all airports. Other types of signs provide guidance to pilots (e.g., signs that show the designation of or direction to runways and taxiways). All signs on lighted runways or taxiways should be lighted.

For the Crows Landing Airport, the only applicable signs considered mandated for airport safety are the Holding Position signs at taxiway intersections with runways. A sign plan should be prepared for the airport, and all signs required or recommended by the FAA should be installed once the airport is upgraded to an ARC C-II facility. An entrance sign should also be installed near the airport operations office or entrance gate.

Helicopter Takeoff and Landing Area

Initially, in lieu of a formal heliport, helicopters are expected to use the runway for landing and takeoff, then hover /taxi to a parking place, or, under good-visibility, daylight conditions, may fly directly to where they intend to park. As helicopter demand increases, a formal takeoff and landing area with appurtenant parking positions can be established. A suitable helicopter parking area would be on the southern-most end of the former Runway 34. Helicopter parking could also utilize existing concrete pavement. The precise location will depend upon the ultimate location of future development on the airport's south side. In general, approximately 3 acres of land will be necessary to accommodate a heliport (i.e., formal takeoff and landing area, helicopter parking spaces, required clear areas, FBO building, and associated automobile parking). An access road to the facility will also be required.

Typical Building Area Functions at General Aviation Airports

Commonly Found Facilities:

- *Based aircraft tiedowns and storage hangars*
- *Transient aircraft parking*
- *Administration building or airport office*
- *Pilots' lounge / flight preparation room*
- *Public rest rooms / public telephones*
- *Fixed-base operations facilities*
- *Fuel storage and dispensing equipment*
- *Aircraft washing area (wash rack)*
- *Security/perimeter fencing and access gates*
- *Access roads and automobile parking*

Other Facilities Common at Larger Airports:

- *Corporate aircraft storage hangars and offices*
- *Air traffic control tower*
- *Emergency response equipment and storage facility*
- *Coffee shop or restaurant*
- *Rental car facilities*
- *Air freight handling facilities*
- *Commercial/industrial buildings*

Building Area Design Factors

The building area of an airport encompasses all of the airport property not devoted to runways, major taxiways, required clear areas, and other airfield-related functions. Common uses of building area land at general aviation airports similar to that anticipated at Crows Landing Airport are listed in the box to the right.

Many types of airport facilities have similar functions and needs, and it is efficient to group similar uses together. For example, high-intensity uses such as corporate hangars and aviation-related businesses, which serve transient aircraft as well as the public, require good visibility from the roads, direct public access, and runway access. Conversely, low-intensity uses such as the smaller aircraft storage hangars (e.g., T-hangars and box hangars) require good runway access. These hangar areas are typically restricted areas with controlled gated-access.

Numerous facilities are essential to the accommodation of future demands for aviation-related use of the airport building area. This ALP identifies the suitable locations and general configurations for future building area development and aviation uses. The precise location and type of facilities will be based on demand and specific facility needs (e.g., convenient road access, large FBO hangar). More detailed designs will be required before construction can begin. The discussion that follows provides a general description of the types of facilities that could be sited at Crows Landing Airport.

Aircraft Hangars

As is the case at most general aviation airports, it is anticipated that the demand for aircraft parking space at Crows Landing Airport will be primarily for hangars. Aircraft storage hangars can be grouped into five general categories:

- **T-Hangars –** T-hangars are the most common form of aircraft storage at general aviation airports. The back-to- back arrangement of the individual T-shaped bays is efficient from a structure-size standpoint, but requires taxilane access on both sides of the building. For reasonable economy of construction, T-hangar buildings preferably should contain at least 10 aircraft bays.

T-Hangar

- **Rectangular –Executive Hangars –** Rectangular-shaped hangar units are well suited to locations where access is practical to only one side of the building. The hangar bays are larger than typical T-hangar units and usually are designed to accommodate twin-engine airplanes or small business jets. Alternatively, they may be used for storage of two or three smaller aircraft. The buildings may consist of either single or multiple bays. Some executive hangars may include small attached office areas.

Executive Hangar

- **Conventional Corporate Hangars –** Corporate hangars are large, free-standing structures intended to house large business jets or multiple smaller aircraft. A size of 100 square feet is common at many general aviation airports, although the size of the buildings can vary. Office and pilots' lounge areas typically are attached. Corporate hangars usually have an adjacent parking area that vehicles can access without passing through a security gate.

Corporate Hangar

- **Shade Hangars**—Shade hangars are similar to T-hangars, but they do not include doors or interior partitions. They help keep the sun and rain off the aircraft, but they do not provide the security afforded by an enclosed T-hangar. Shade hangars can be constructed advantageously on existing apron pavement in that water drainage through the building is not a concern. Compared to T-hangar construction for which existing pavement must be removed and the site regraded, shade hangars may cost only half as much. On raw ground, the price between the two types differs by only 20%. Shade hangars can be optimal in locations where the mass of an enclosed building would act as a visual barrier.

Shade Hangar

- **Individual Portable Hangars**—Portables are small, individual hangars designed to be constructed elsewhere and hauled to the airport. They typically are T-shaped, but can be rectangular. An advantage of portables is that they can be added economically in increments of just one unit at a time. However, the cost per unit is similar to, or even higher than, the cost of an individual unit in a multiple-unit T- hangar

Portable Hangar

building. Most often they are owned individually rather than by the airport or a hangar developer. Portables can be installed almost anywhere on the airport, including on existing apron pavement or on unpaved areas. A chief disadvantage is that their inconsistency of appearance. Poor maintenance can make them unattractive.

Tiedown Apron

Spaces for based and smaller transient aircraft are normally equipped with tiedown anchors and chains or ropes to prevent the aircraft from being battered by strong winds.

Aircraft Apron

Airports need paved apron areas for parking the portion of their based aircraft fleet that is not hangared, as well as for short- term usage by transient aircraft visiting the airport.

Initially, portions of the former Crows Landing Air Facility apron will be used for aircraft parking. There is sufficient space to accommodate approximately five tie-down positions, which would accommodate demand through the intermediate phase of development (see **Table 3-2**). Additional tie-down aprons will be required to accommodate future increased numbers of based and transient aircraft.

Airport Operations Office

An administration building should be centrally located with good access both to the transient aircraft apron and to automobile parking. Many GA airports have an administration building that houses not only the airport management offices, but also a pilots' lounge, rest rooms, and other facilities for pilots and the public. Sometimes a coffee shop or restaurant is included. In the future, a multi- function administration building may be necessary. To draw more transient activity, attractive facilities for pilots and other visitors and provision of a meeting area would be advantageous.

Initially, a small, modular building can be used for airport offices located near the entrance to Crows Landing Airport. This location affords good views of the runway, parking aprons, and self-fueling facility, as well as convenient public access. The modular building can be initially sited on the existing concrete pavement.

Fixed-Base Operations Facilities

Fixed-base operators (FBO) constitute the commercial side of general aviation business. They provide a wide variety of facilities and services for pilots and their aircraft (see adjacent box). Busy airports usually have multiple FBOs, while smaller ones may have one or none. The primary FBOs at an airport commonly offer many of these facilities and services; specialized FBOs may supply just one. Also, at many airports, the airport operator provides some or all of the hangar facilities and fueling services. FBOs often develop and own their facilities on land leased from the airport, but in many cases both the facilities and the land are leased. Primary FBOs should be situated where they are easily visible and accessible both from the airport's airside and from adjacent roads. Specialty FBO sites can be sited in more isolated locations, although vehicle access without the need to go through a security gate is desirable.

Examples of FBO Facilities and Services

- Aircraft rental and charter
- Flighting instruction
- Flight preparation room, pilots' lounge and rest rooms
- Pilots' supplies
- Aircraft and avionics maintenance and repair
- Aircraft fueling
- Based aircraft hangar and tiedown space rental

Sufficient space in the northeast and southwest building areas is available to accommodate establishment of future FBO facilities. The primary constraint is providing sufficient public access and utilities to these areas. Initial FBO development is anticipated near the airport's entrance in the northeast building area.

Other Support Facilities

- **Aircraft Fueling Facilities**—Fuel can be stored in aboveground tanks and/or dispensed by truck. The ability for small aircraft to obtain fuel at self-service pumps with 24-hour, credit-card-type access is desirable. For larger aircraft, especially for turbine-powered aircraft, fuel delivered by truck is desirable. As airport activity increases, a site near the transient parking apron may be needed (see **Figure 3B**).
- **Aircraft Wash Rack**—Construction of a pollution control facility (e.g., wash rack) may be considered. Siting the wash rack and fueling facility in close proximity of each other would enable sharing of a filtration system. The pollution control facility should be designed to meet current state and local standards to control pollutants from aircraft washing.
- **Air Traffic Control Tower**—The projected activity during the 20-year planning horizon is below the volume at which establishment of an air traffic control tower at the airport is warranted.
- **Airport Fire Station**—Fire protection at the airport is anticipated to be provided by the West Stanislaus Fire Department located in the City of Patterson and on-site fire extinguishers. FAA would not require an on-site firefighting facility during the planning horizon.

Safety and Security

Fencing and Gates

The principal form of security at most GA airports is a perimeter fence and controlled-access gates. For safety and security purposes, fencing should keep unauthorized individuals and especially vehicles from accessing the aircraft operating areas and building area. Entry should be possible only with an access code, card, or remote control or by passing through a monitored area such as the airport administration building or a fixed-based operations facility. Determining appropriate locations for fencing and gates in an airport building area can be complex in that public access to certain facilities needs to be maintained.

In May of 2004, the Transportation Security Administration, in conjunction with a wide group of general aviation industry representatives, developed and disseminated a series of security recommendations for consideration by general aviation airport operators, tenants, and users entitled Security Guidelines for General Aviation Airports (IP A-001). These recommendations, while not regulatory, should be carefully considered for application at Crows Landing Airport.

A perimeter fence will be provided during the initial phase of development. Perimeter fencing at the Crows Landing Airport would initially be located along Davis and Bell roads, as well as around the airport's entrance to the core building area. As airport activity increases and growth occurs in the adjacent industrial business park, the remainder of the airport property will need to be enclosed. Additional fencing will be needed in the long term in conjunction with airfield expansion and the acquisition of additional property.

Utilities

The utility lines to the former Crows Landing Air Facility (e.g., water and sewer, electricity, gas and telephone hook-up) will be provided as part of the Crows Landing Business Park Development and extended onto the airport site. Capacity is not assumed to pose a problem for most of the potential aviation uses.

Drainage

The topography at the Crows Landing Airport is very flat. Once the property on the northeast side of the airfield is developed with impervious parking and building areas, additional drainage facilities will be necessary. Grading of the northeast building area will need to provide positive drainage flows to maintain and formalize the general drainage patterns currently existing on the airport. While drainage will need to be considered in the engineering designs of the north-side facilities, it is not a significant layout planning consideration. At some point in the future, it may prove advantageous to prepare a Storm Water Drainage Master Plan to address the long-term drainage development needs of the airport.

Road Access

Good road access and visibility from adjacent roads are important marketing factors for most businesses that serve local pilots and the general public.

- **Internal Service Road**—An internal service road is needed to enable vehicles to travel around the airport without entering the controlled aircraft movement area and allow them to get from one part of the airport to another without using public roads or passing through gates. The service road is not open to the general public, only to airport vehicles, hangar tenants, and others authorized to pass through a controlled-access gate. These features are a time-saving convenience. In addition, the ability to remain off the public roads is particularly important for fuel trucks in that these vehicles normally are not licensed and insured for driving on public roads. Providing continuous vehicular access between the northeast and southwest building areas will require going around the ends of the runway. An internal service road for the Crows Landing Airport is proposed to follow the airport property to ensure clearance of critical airfield safety areas (RSA, OFA). However, internal service roads may not be necessary in all areas depending on the layout of new development on the northeast side. The internal access road is anticipated to accommodate the fuel trucks, hangar tenants, and other authorized vehicles. Thus, the load bearing capacity of the future service road pavement will need to be capable of handling the weight of the fuel trucks.
- **External Road Access—** Convenient access from the adjacent major roads is essential to aviation-related businesses located at the airport. Corporate hangars also need to be accessible without the need for visitors to pass through a controlled-access gate. The difficulty of providing a good external road access to the interior area of the north-side property is a significant constraint to the options for development of the site. Therefore, the layout of airport facilities will depend largely upon on the external road network.

Table 3-1

Airport Development Concepts
Crows Landing Airport

Phase	Development Concepts
At Opening (O to 10 Years)	**Airport Reference Code B-II (small)** ▪ One Portland cement concrete runway: Runway 11-29 (5,175' x 100') ▪ Unlighted runway –daytime use, visual flight rules (VFR) only ▪ Small airport operations office (e.g., modular unit) on existing concrete pavement ▪ Small aircraft parking apron with 5 tiedowns on existing concrete pavement fronting operations office ▪ Up to 10 privately financed hangars on County leases sited on existing concrete pavement ▪ All aeronautical support facilities to be sited on northeast side of Runway 11-29 (e.g., aprons, hangars) ▪ Perimeter fencing along Davis and Bell Roads and apron area ▪ Basic aviation fuel services: 100LL via self-service from a skid-mount tank and maybe Jet-A via a refueler truck ▪ Wash rack facility, perhaps combined with fueling facility to allow sharing of filtration system ▪ Moldular unit with telephones/wifi and restrooms
Future (11 to 30 Years)	**Airport Reference Code B-II** ▪ One Portland cement concrete runway: Runway 11-29 (5,175 x 100') ▪ Full-length parallel taxiway on northeast side ▪ Medium intensity runway lights, PAPI, rotating beacon ▪ Nonprecision instrument approach capability (GPS based) ▪ Basic Fixed Base Operator (FBO) services: on-site presence, basic aircraft maintenance, and maybe an FBO hangar, little or no flight training by FBO anticipated ▪ Small terminal building to replace modular unit (passenger waiting area, phone, restrooms, operations office), perhaps combined with FBO facilities ▪ Basic helicopter takeoff and landing area using existing hard-surface area southwest of Runway 11-29 may be acceptable ▪ Perimeter access road and perimeter fencing fully enclosing airport property ▪ Additional privately-developed aircraft storage hangars
: **Ultimate (>30 Years)**	**Airport Reference Code C-II** ▪ One Portland cement concrete runway: Runway 11-29 (6,175' x 100') ▪ New full-length parallel taxiway on northeast side of Runway 11-29 satisfying ARC C-II standards ▪ Precision (GPS-based) instrument approach capability ▪ Aviation fuel services/jet fuel ▪ Additional Fixed Base Operator services (e.g., specialty aeronautical services; some flight training) ▪ Enhanced heliport facility (e.g., takeoff and landing area, helicopter parking, FBO facility) ▪ Begin development of aeronautical support facilities (e.g., aprons, tied-owns, hangars) on southwest building area

Table 3-2

Airport Design Standards
Crows Landing Airport

Airfield Element	At Opening (0 to 10 years)	Future (11 to 30 years)	Ultimate Build-out (>30 years)
Airport Property (acres)	370	No Change	592
Airport Reference Code (ARC)	B-II	No Change	C-II
Runway Design	**At Opening**	**Future**	**Ultimate Build-out**
Runway Length	5,175'	No Change	6,175'
No. of Runways	1	No Change	No Change
Runway Safety Area (RSA) Length Beyond Runway End	300'	No Change	1,000'
Runway Safety Area Width	150'	No Change	500'
Object Free Zone (OFZ) Width	400'	No Change	No Change
Object Free Area (OFA) Width	500	No Change	800
Runway Protection Zone (RPZ) (inner width, outer width, length)	250' x 400' x 1,000'	No Change	1,000' x 1,750' x 2,500'
Runway markings	Basic	Non-precision	Precision
Approach and Landing Aids	**At Opening**	**Future**	**Ultimate Build-out**
Approach Type	Visual	Non-precision (GPS-based)	Precision (GPS-based)
Approach Slope[1]	20:1	34:1	50:1
Primary Surface Width[1]	250'	500'	1,000'
Runway Lighting	None	MIRL/REIL[2]	No Change
Approach Lights	None	None	MALSR[2]
NAVAIDS[2]	Segmented circle, unlit wind cones	Segmented circle, Lighted wind cones, Rotating Beacon,PAPI[2]	No Change

Table 3-2, continued

Airport Design Standards

Taxiway Design	At Opening	Future	Ultimate Buildout
No of parallel Taxiways (standard taxiway width)	1 (35')	No Change	1[3] (35')
Taxiway Separation Distance[4]	288'	No Change	400'
Taxiway Hold Line Distance[4]	200'	No Change	250'
Other Design Factors	**At Opening**	**Future**	**Ultimate Buildout**
Building Restriction Line[5]	B-II:15' and 30'	No Change	C-II: 15' and 30'
Airplane Parking Line[6]	66'	No Change	No Change
Hangar Units	15	35	65
Tie-down Spaces	5	No Change	No Change
Based Aircraft	20	40	80
Heliport	None	70' x 70'	No Change

Notes

[1] Consistent with criteria established in Federal Aviation Regulation (FAR) Part 77, *Safe and Efficient Use of Navigable Airspace.*

[2] Definitions: Medium Intensity Runway Lights (MIRL); Runway end identifier lights (REIL); Navigational Aids (NAVAIDs); Precision Approach Path Indicator (PAPI); Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)

[3] A new parallel taxiway to be constructed to meet FAA separation standards for ARC C-II runways

[4] Distance measured from runway centerline

[5] Building restriction line (BRL) separation from Runway Centerline:
ARC B-II (small):15' = 355'; ARC B-II (small):30' = 460'; ARC C-II:15' = 605'; ARC C-II:30' = 710'

[6] APL separation requirement from taxiway centerline

Note: proposed design consistent with FAA airport design standards (FAA Advisory Circular 150/5300-13, Change 1, *Airport Design).*

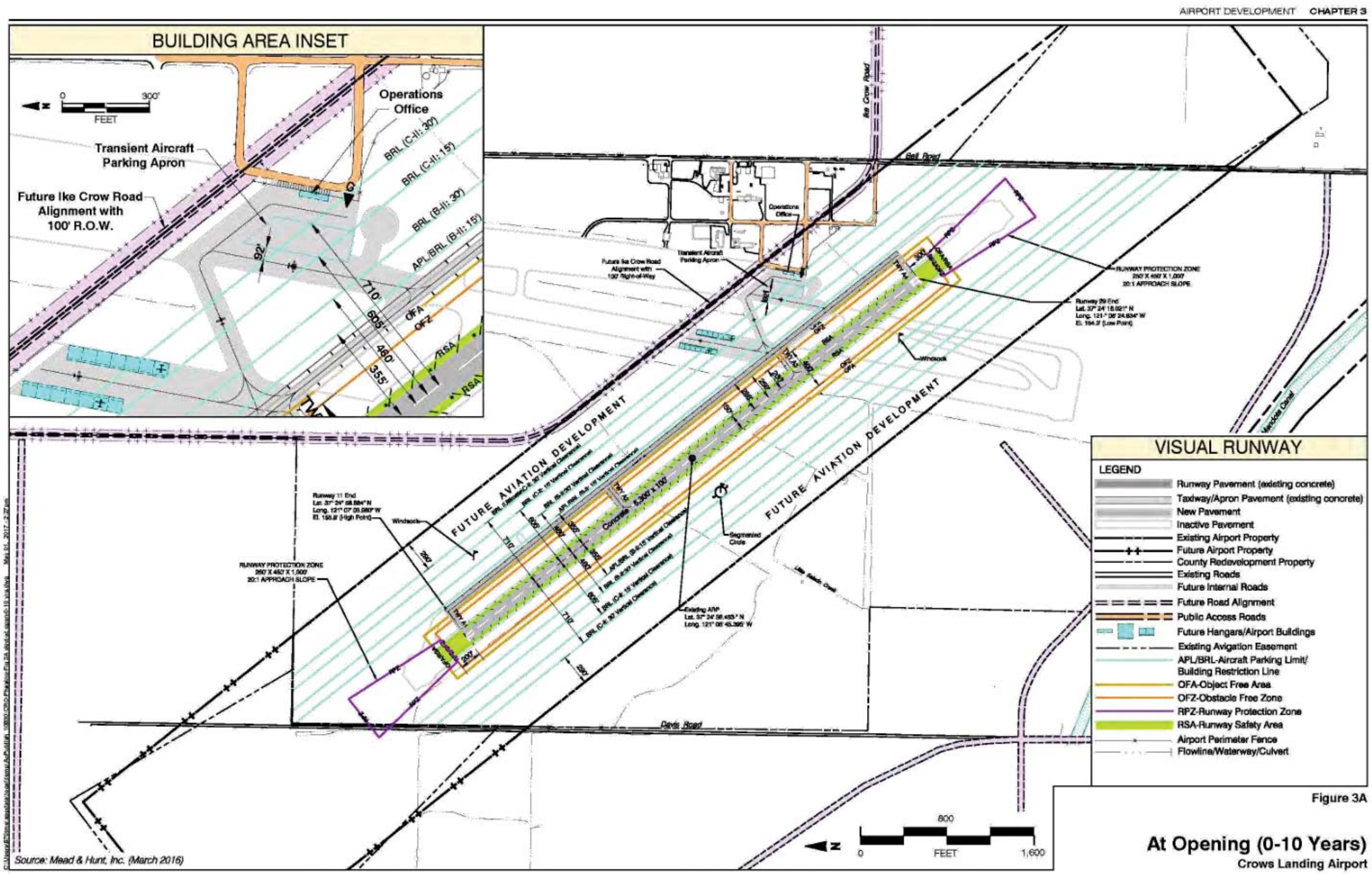


Figure 3A

At Opening (0-10 Years)
Crows Landing Airport

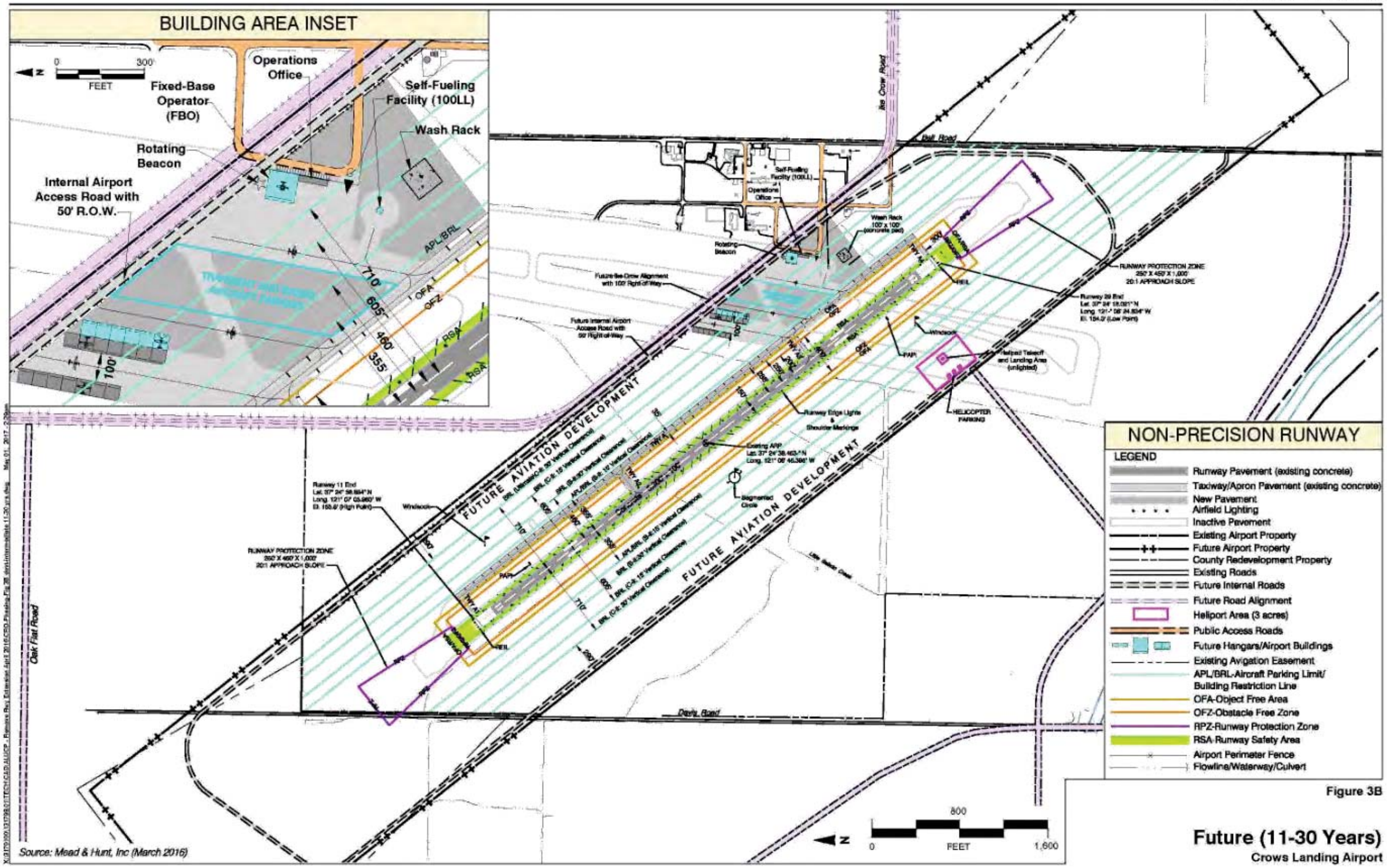


Figure 3B

Future (11-30 Years)
Crows Landing Airport

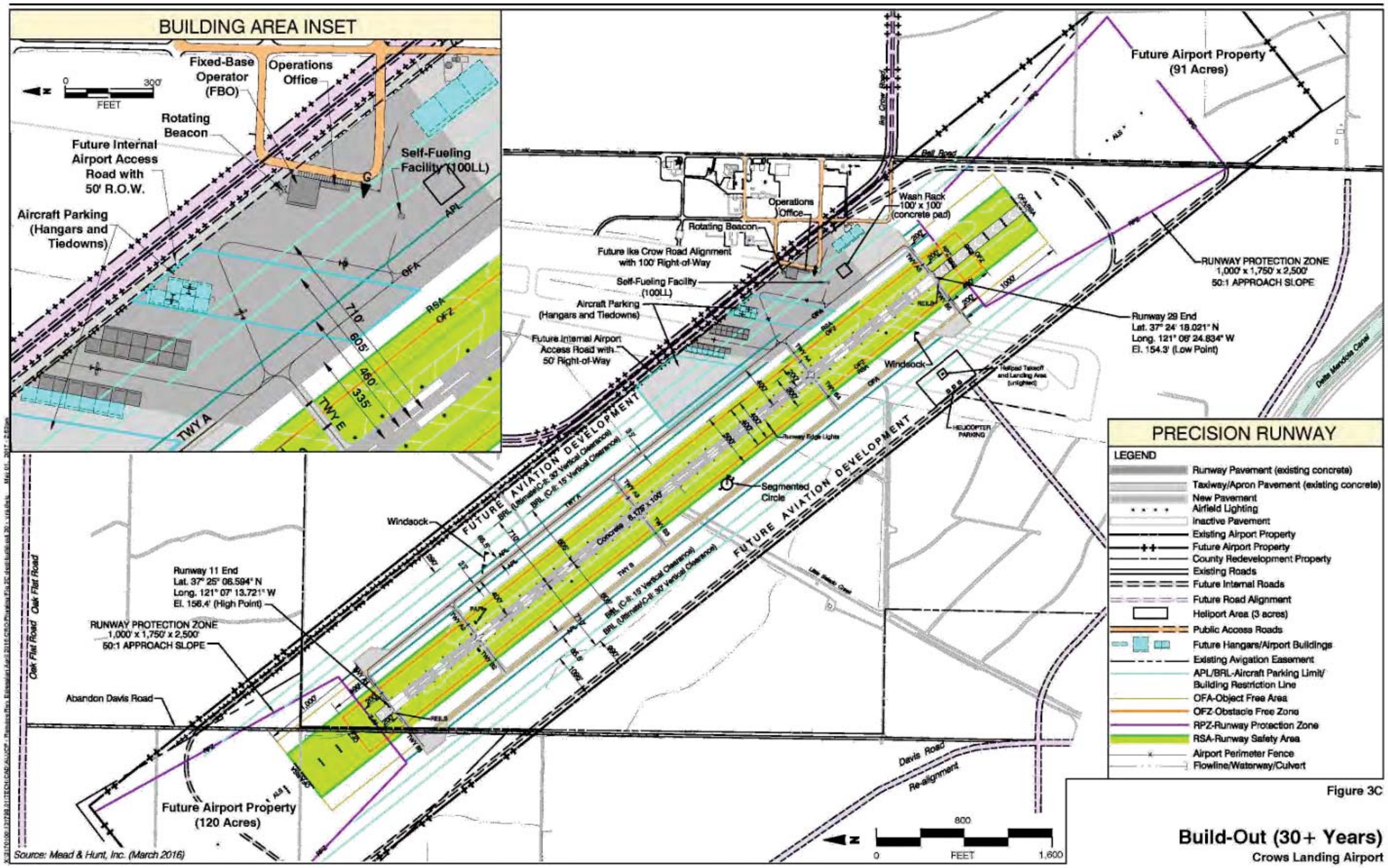


Figure 3C

Build-Out (30+ Years)
Crows Landing Airport

CHAPTER 4

AIRPORT PLANS

4

AIRPORT PLANS

This chapter describes the plan documents associated with the recommended airport development program as set forth in Chapter 3. Airfield and building area improvements are necessary to maintain safety and operational efficiency and to accommodate projected aviation demand.

An Airport Layout Plan (ALP) is a graphic representation of the airport owner's intentions regarding the future course of airport development. The ALP is a key document that that serves as a reference to aviation requirements, as well as to land use and financial planning. It is a prerequisite for state or federal funding of airport improvement projects. The California Division of Aeronautics requires approval of an ALP in order for the airport to qualify for issuance of an operating permit and possible California Aid to Airports Program funding. At the federal level, a current airport layout plan must be approved by the Federal Aviation Administration (FAA) before a project can become eligible for funding under the Airport Improvement Program (AIP). In addition, proposed capital projects must be consistent with the ALP, and the ALP must be updated periodically.

It is anticipated that the Crows Landing Airport will seek classification as a National Plan of Integrated Airport Systems (NPIAS) airport. The NPIAS identifies existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the AIP. The NPIAS also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. A majority of the NPIAS projects are considered to be of high-priority as they are intended to rehabilitate existing infrastructure and enhance airport safety. The timing of these improvements may be affected by economic conditions.

AIRPORT LAYOUT PLAN DRAWINGS

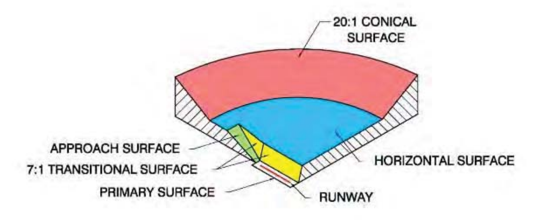
As presented at the end of this report, the Crows Landing Airport ALP set consists of: the following drawings: Index Sheet (Sheet 1), ALP (Sheet 2), Airport Data (Sheet 3), Airspace Plan (Sheets 4 to 5), and Property Map (Sheet 6). Although the Airport is These drawings are prepared guidelines set forth in Title 21, Section 3534 of the California Code of Regulations and FAA criteria established in FAA's Advisory Circular *150/5300-13, Change 1, Airport Design,* FAA Advisory Circular 150/5070-6A, *FAA Standard Operating Procedures 2.00 and 3.00*, and Title 14 of the Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of Navigable Airspace.* The principal drawing illustrating the long-term development plan for the Airport is the Airport Layout Plan itself (Sheet 2). The Part 77 Airspace Plan defines the airspace required for air navigation.

Airport Layout Plan

The ALP drawing (Sheet 2) depicts the phased development of the Crows Landing Airport, including the recommended locations of the runway, apron area, and other supporting airport facilities (e.g., internal access road, heliport). Pertinent clearance and dimensional information are indicated as needed to show conformance with applicable airport standards. Other important data, (airport latitude, longitude, and elevation; runway gradient and orientation; pavement strength; expected number of based aircraft; etc.) are noted in tabular form.

Airspace Plan

The principal strategy of mitigating hazards within the vicinity of an airport centers on FAA regulations set forth in 14 CFR Part 77, Safe, *Efficient Use, and Preservation of Navigable Airspace* Part 77 establishes regulatory standards for determining obstructions to navigable airspace and the effects of such obstructions on the safe and efficient use of that airspace. The regulations require that the FAA be notified of proposed construction or alteration of objects—whether permanent, temporary, or of natural growth—if those objects would achieve a height which exceeds the FAR Part 77 criteria. The height limits are defined in terms of imaginary surfaces in the airspace and extend approximately 2 to 3 miles around airport runways and approximately 9.5 miles from the ends of runways having a precision instrument approach. The FAA conducts an aeronautical study of proposed construction and determines whether the use would be a hazard to air navigation. The evaluation considers only the height of the proposed structure(s). The FAA may recommend removal, marking, or lighting the obstruction(s). The Airspace Plan consists of Sheets 3 and 4.



TYPICAL FAR PART 77 SURFACES

The FAA also provides guidance on avoiding certain land uses on or near an airport which could endanger or interfere with the landing, taking off, or maneuvering of an aircraft at an airport. Specific land use characteristics to be avoided include:

- Tall structures
- Hazardous wildlife attractants
- Creation of glare, dust, steam, or smoke, which could impair visibility for pilots
- Lights that could be mistaken for airport lights or otherwise interfere with a pilot's vision
- Facilities that produce electronic interference with aircraft communications or navigation equipment

FINANCIAL FACTORS

One of the means available to help ensure financially sound airport development is to avoid facility construction too far in advance of the demand. As noted in Chapter 2, the growth in numbers of based and transient aircraft at Crows Landing Airport is expected to be moderate throughout the 30-year planning horizon. The growth rate for the principal measure of demand—the size of the airport's based aircraft fleet—is expected to average two percent per year. However, it is more likely that increases in the fleet size will occur in erratic increments rather than in the consistent two to three percent annual rate of growth rate suggested.

Development Staging

The challenges to the appropriate staging of airport facility development over an extended period of time are twofold.

- One challenge is to minimize costly "Phase 1" construction that may not be fully utilized (and paid for) for many years.
- Another challenge is posed by the need to ensure that early development is not located in a manner that, while perhaps less expensive initially, hinders future development.

The overall goal of an ALP is to establish a plan that is flexible enough to adapt to changes in type and pace of facility demands, is cost-effective, and optimizes functionality during each stage of development.

Financial Issues

Because the opening of a new airport is a complex project, special attention needs to be given to certain financial issues. (Advance recognition of potential problems will help to avoid costly remedies later.) Not only is it important to take all the necessary actions, but it is also important to take these actions in the proper sequence. Among these issues are:

- **Funding Commitments** – Unless another source of funding is readily available, County expenditure of any significant sums of money for engineering design or other work should await notice of a tentative allocation of funds from the FAA following inclusion in the NPIAS.
- **Role of Project Engineer –** Regardless of whether County staff is utilized or a consultant is hired, the project engineer should be familiar with the entire airport development process.
- **Pre-application for Federal Grants** – The pre-application for Federal funds should state the estimated cost of the complete first stage of airport development including construction. The pre-application should be revised as engineering designs allow more refined estimates of development costs.

Management and Operational Issues

Other issues that should be addressed prior to opening of a new airport include, but are not limited to:

- **Management Alternatives** – The form of management desired for the new airport must be determined and necessary personnel hired to perform on-site duties. For the Crows Landing Airport, is recommended that the management be shared between County departments based on expertise.
- **Lease and Rental Agreements –** Consideration should be given to obtaining a fixed-base operator (FBO) for the airport. Also, rates and charges for T-hangars, tie-downs, and other facilities must be set.
- **Airport Rules and Regulations –** These should be adopted, even if only on an interim basis, before the new airport opens.

- **Airport Minimum Standards –** A set of standards that define the service, personnel, and facility requirements needed to conduct commercial operations on the airport should be established and in place prior to or shortly after place prior to the opening of the airport.
- **Land Use Controls** – Several actions, including the adoption of an Airport Land Use Compatibility Plan (ALUCP) by the County’s Airport Land Use Commission and the adoption of General Plan and Zoning Code amendments, are essential to the long-term viability of the new airport.

The following pre-planning, design, and operational tasks will need to be completed prior to opening the Crows Landing Airport for public use.

Table 4-1. Pre-Opening Issues Crows Landing Airport, Stanislaus County, California	
Tasks	▪ Delineate an appropriate Airport access road system ▪ Construct appropriate security fencing and gates to preclude inadvertent access to the Airport ▪ Remove old military airfield surface markings and signs conflicting with new public-use general aviation airport requirements ▪ Remove all former military obstructions/surface deviations/equipment/etc. that interfere with public-airport use ▪ Mark former Runway 16-34 as permanently closed (i.e., with painted “X”s) ▪ Clean and fill all cracks on Runway 11-29 (@ ~~5,300~~ 5,175’ x 100’), parallel taxiway system (@ 35’ wide), and apron use areas ▪ Restripe/remark/resign airfield surfaces (e.g., runway, taxiways, apron areas) as appropriate ▪ Install segmented circle and three unlighted wind cones (one at each approach end and one at segmented circle) ▪ Install tie-down anchors (cable-based or fixed point) as appropriate on aircraft parking aprons ▪ Establish an operational focal-point (e.g., operations office, telephone, restrooms, etc.) ▪ Endeavor to provide 24-hour user accessibility to telephone and restrooms ▪ Provide a basic level of emergency response capability (e.g., locate portable fire extinguishers near apron areas, establish notification procedures for emergency response by local fire department, provide public telephone capability) ▪ Determine the appropriate level of County staffing presence desired for Airport operational/maintenance/security/safety ▪ Arrange for appropriate airport insurance coverage to protect the County ▪ Apply for Airport Permit from California Division of Aeronautics ▪ Issue appropriate Notices-To-Airmen announcing Airport availability ▪ Facilitate development of privately-funded aircraft storage hangars as appropriate

Funding Sources

The primary source of funding for most of the substantial capital improvements recommended for Crows Landing Airport is the FAA following inclusion in the NPIAS. Limited funding is available through the Aeronautics Account of the Caliortation Fund. Specific funding programs for airport improvement projects include the following:

Federal Airport Improvement Program (AIP) Grants

AIP provides both entitlement funds and discretionary funds. These entitlement funds can be used each year that they become available or they can be held up to two years for a larger project. The AIP program also allows for discretionary funding to be made available from the FAA to provide financial support for capacity and safety-related projects, as well as projects intended to keep the critical components of the airfield operational (e.g., runway/taxiway rehabilitation).

Projects that are eligible for FAA AIP funding are determined based on guidelines contained in FAA Order 5100.38, *Airport Improvement Handbook*. As a general rule, only airport projects that are related to non-revenue producing facilities, such as airfield construction, public areas of a terminal, and land acquisition, have been eligible for federal funding. For general aviation airports in California, the FAA share is 95%, with a 5% match required from the airport sponsor.

State of California Aviation Program

The State of California operates an airport grant program similar in concept to the Federal AIP program. The state grant program is administered by the California Department of Transportation's Division of Aeronautics. All grants are awarded on a competitive basis. Grants are judged using a numerical weighting scheme. As with the Federal program, priority is given to projects that enhance safety.

- **State Annual Grant**—General aviation airports are eligible to receive a $10,000 annual grant. These funds can be used for airfield maintenance and construction projects, as well as airfield and land use compatibility planning. Airports can accumulate these funds for up to five years. No local match is required for an annual grant.
- **AIP Matching Grants**—This state grant assists the airport sponsor in meeting the local match for AIP grants from the FAA. The state's AIP matching grant provides 5% of the federal share of eligible projects. Currently, with the federal share at 95%, the state will contribute 4.75%, leaving the airport sponsor's match at just 0.25% of the project amount.
- **Acquisition and Development Grants**—This state grant program is similar to the FAA's AIP in that an outright grant is offered for qualifying projects. The local match can vary from 10% to 50% of the project's cost. The local match rate has been 10% during the last 25 years.

The Division of Aeronautics also administers a revolving loan program called the State Loan Program. Loans are available to provide funds to match AIP grants to develop revenue –producing facilities (e.g., aircraft storage hangars and fuel facilities). The interest rate is favorable and the payback period is between 8 and 17 years.

Other Grant Programs

Airport projects can also sometimes qualify for grant funding from non-aviation sources. Although not commonly available, airports have received grants from a variety of federal and state programs including: economic development, community development, and rural infrastructure. Airports are encouraged to seek out and qualify for these non-aviation funding programs where applicable.

Local/Airport Funds

At general aviation airports similar to the proposed Crows Landing Airport, airport sponsor self-funding is principally provided by a combination of airport-generated income and owner (County) funds. Funding airport improvements that are not grant eligible and providing the local matching share for grants-in-aid are usually the simplest most economical methods because direct interest costs are eliminated.

Cost Estimates

The proposed 20+ year capital improvement program for Crows Landing Airport is presented in **Table 4-2**. Proposed improvements described in the preceding chapter are included on the list according to the proposed development phases discussed in Chapter 3.

- At Opening (0 to 10 years)
- Future (11 to 30 years)
- Ultimate Runway Buildout (>30 years)

The indicated costs are order-of-magnitude estimates in 2016 dollar values. Design engineering, construction inspection, and other related costs are included for each item and a contingency factor is added as well. The cost estimates are intended only for preliminary planning and programming purposes. Specific project analyses and detailed engineering design will be required at the time of project implementation to provide more refined and up-to-date estimates of the individual project costs.

The ALP drawing depicts the location of each of the proposed major improvements and the anticipated time frame of construction. The timing indicated is based upon the forecasts presented in Chapter 2. It is important to emphasize, though, that the general sequence of development indicated in the capital improvement program is more significant than the precise timing. The actual timing of major improvements will be driven by demand and funding availability, not by the calendar. If the growth rate of projected aviation activity is not realized, then each phase of development would extend over additional years. On the other hand, demand for construction of certain facilities could arise more quickly than the staging plan anticipates.

NOISE IMPACTS

Approval for individual components of the airport capital improvement program recommended for Crows Landing Airport will occur within the environmental review framework of Stanislaus County. The environmental impacts associated with the Airport are being established as part of the General Plan Update for the Crows Landing Redevelopment Area and its immediate vicinity.

Noise is often described as unwanted or disruptive sound. A pure sound is measured in terms of: its magnitude, (often thought of as loudness) as indicated on the decibel (dB) scale; its frequency, (or tonal quality) measured in cycles per second (hertz); and its duration or length of time over which it occurs (See **Table 4-3** for examples of typical decibel levels). To measure the noise value of a sound other factors must also be considered. Airport noise is particularly complex to measure because of the widely varying characteristics of the individual sound events and the intermittent nature of these events' occurrence.

CNEL Contour Calculations Inputs

- *The number of operations by aircraft type or group.*
- *The distribution of operations by time of day for each aircraft type.*
- *The average takeoff profile and standard approach slope used by each aircraft type.*
- *The amount of noise transmitted by each aircraft type, measured at various distances from the aircraft.*
- *The runway system configuration and runway lengths.*
- *Runway utilization distribution by aircraft type and time of day.*
- *The geometry of common aircraft flight tracks.*
- *The distribution of operations for each flight track.*

In an attempt to provide a single measure of airport noise impacts, various cumulative noise level metric have been devised. The metric most commonly used in California is the Community Noise Equivalent Level (CNEL). The results of CNEL calculations are normally depicted by a series of contours representing points of equal noise exposure in 5 dB increments. Key factors involved in calculation CNEL contours are noted to the left.

Noise contours were prepared using the FAA's Integrated Noise Model (Version 7.0). The results are presented at the end of this chapter. **Figure 4B** presents the aircraft noise contours for the activity levels at opening. Future (11 – 30 years) aircraft noise contours are presented in **Figure 4C**. **Table 4-4** summarizes airport activity data.

Crows Landing Airport
Capital Improvement Plan Cost Estimates - DRAFT

Phased Projects		Cost Estimate
Short Term: At Opening to 10 Years		
A1	Remove old runway lighting and level runway RSA, OFZ and OFA	$ 712,000
A2	Perform Airport Pavement Management Plan and clean and fill runway/taxiway/apron pavement cracks / other pavement repairs	$ 589,600
A3	Prepare Airfield Marking Plan, remove old airfield marking and paint new taxiway and runway markings for visual runway	$ 214,000
A4	Repair airport access roads and utilities	$ 425,000
A5	Construct airport entrance and parking spaces	$ 468,000
A6	Install airport entrance sign	$ 60,000
A7	Install apron security lighting near airport entrance	$ 210,000
A8	Install 25,000 LF 8 foot fence with 3-strand barbed wire along airport boundary and manual gate at airport entrance	$ 890,000
A9	Install 4 taxiway hold signs	$ 30,000
A10	Install segmented circle and 3 wind cones (non-lit)	$ 72,500
A11	Install 10 tiedowns and site preparation for 5 hangars	$ 122,500
A12	Install 780 s.f. modular unit for operations office with restrooms and utility connections	$ 256,750
A13	Install 12,000 gallon skid-mounted general aviation fuel tank (100LL), jet-A refueler truck, truck pad and wash rack	$ 160,000
A14	Construct Connector Taxiways A2, A3, A4, A5.	$ 400,000
	Subtotal	**$ 4,610,350**
Intermediate Term: 11 to 30 Years		
B1	Construct additional apron area to accommodate aircraft tiedowns, hangars and FBO sites	$ 4,110,000
B2	Construct internal perimeter access road and install manual gate at Bell Road to access helipad	$ 505,000
B3	Paint helipad markings on southwest side of runway	$ 25,000
B4	Remark Runway 11-29 to reflect non-precision (GPS based) instrument approach	$ 60,000
B5	Install Medium Intensity Runway Edge Lights (MIRL)	$ 398,300
B6	Install Runway End Identifier Lights (REILS) at each runway end	$ 42,550
B7	Install Precision Approach Path Indicator (PAPI) at each runway end	$ 334,500
B8	Install rotating beacon	$ 40,000
B9	Light existing wind cones (3 wind cones)	$ 43,500
B10	Construct additional apron area northeast of airfield	$ 4,860,000
B11	Replace modular unit with permanent terminal building including pilot lounge, restrooms and airport office space(s)	$ 450,000
	Subtotal	**$ 10,868,850**
Runway Build Out Concept: 30+ Years		
D1	Acquire 202 acres for future airport expansion and remove obstructions	TBD
D2	Construct 1,000-foot extension of Runway 11 to north & blast pad, realign REILS, & remark runway for precision instrument approach	TBD
D3	Construct and mark new parallel taxiway and remark old taxiway pavement as closed	TBD
D4	Construct internal perimeter access road around Runway 11 extension, abandon segment of Davis Road and remove segment of perimeter fence	TBD
D5	Install 10,500 ft. of perimeter security fencing to enclose future airport property and additional security gate	TBD
D6	Install MALSR approach lighting at both ends of Runway 11-29	TBD
D7	Mark blast pad for Runway 29	TBD
D8	Construct additional apron area west of runway	TBD
	Subtotal	***TBD***
	TOTAL	**$ 15,479,200**
*	Aircraft storage hangars anticipated to be provided by private sector	
**	Cost estimates in 2016 dollars	

Table 4-2. Airport Improvement Cost Estimates

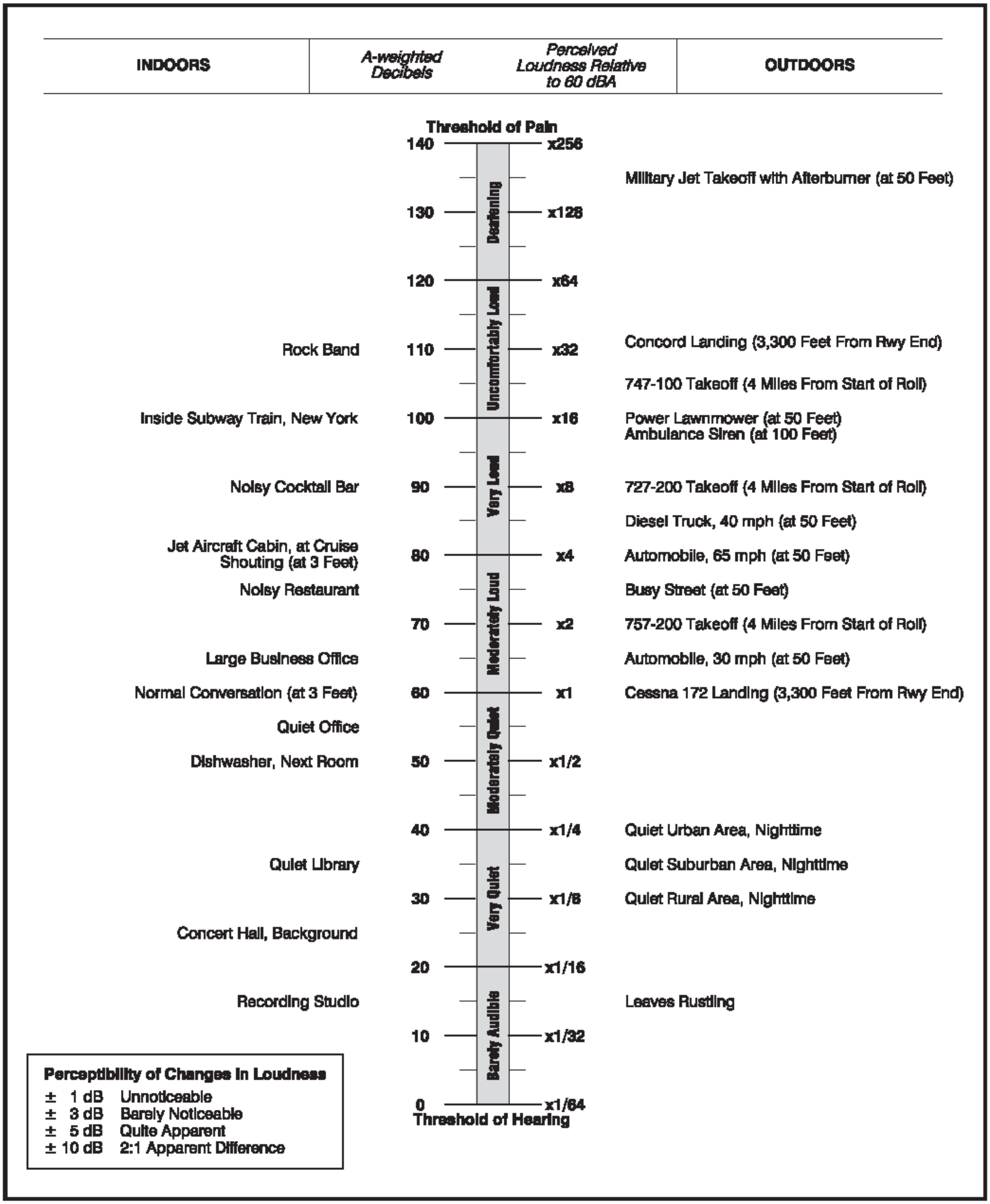

INDOORS
A-weighted Decibels
Perceived Loudness Relative to 60 dBA
OUTDOORS
Threshold of Pain
140 x256
Military Jet Takeoff with Afterburner (at 50 Feet)
130 x128
Deafening
120 x64
Uncomfortably Loud
Rock Band 110 x32 Concord Landing (3,300 Feet From Rwy End)
747-100 Takeoff (4 Miles From Start of Roll)
Inside Subway Train, New York 100 x16 Power Lawnmower (at 50 Feet)
Ambulance Siren (at 100 Feet)
Very Loud
Noisy Cocktail Bar 90 x8 727-200 Takeoff (4 Miles From Start of Roll)
Diesel Truck, 40 mph (at 50 Feet)
Jet Aircraft Cabin, at Cruise
Shouting (at 3 Feet) 80 x4 Automobile, 65 mph (at 50 Feet)
Noisy Restaurant
Busy Street (at 50 Feet)
Moderately Loud
70 x2 757-200 Takeoff (4 Miles From Start of Roll)
Large Business Office
Automobile, 30 mph (at 50 Feet)
Normal Conversation (at 3 Feet) 60 x1 Cessna 172 Landing (3,300 Feet From Rwy End)
Quiet Office
Moderately Quiet
Dishwasher, Next Room 50 x1/2
40 x1/4 Quiet Urban Area, Nighttime
Quiet Library
Quiet Suburban Area, Nighttime
Very Quiet
30 x1/8 Quiet Rural Area, Nighttime
Concert Hall, Background
20 x1/16
Recording Studio
Leaves Rustling
Barely Audible
10 x1/32
0 x1/64
Threshold of Hearing
Perceptibility of Changes in Loudness
± 1 dB Unnoticeable
± 3 dB Barely Noticeable
± 5 dB Quite Apparent
± 10 dB 2:1 Apparent Difference

Table 4-3

BASED AIRCRAFT

	At Opening [a] Year 0-10	Future [b] 11-30 Years
Aircraft Type		
Single-Engine, Piston	10	50
Twin-Engine, Piston	--	10
Turboprop	--	14
Business Jets	--	6
Total	*10*	*80*

Aircraft Operations

	At Opening [a] Year 0-10	Future [b] 11-30 Years
Total		
Annual	4,000	34,000
Average Day	11	93
Distribution by Aircraft Type		
Single-Engine, Piston	100%	65%
Twin-Engine Piston	--	10%
Turboprop	--	15%
Business Jet	--	10%
Distribution by Type of Operation		
Local (incl. touch-and-goes)	75%	44%
Itinerant	25%	56%

Time of Day Distribution [A]

	At Opening Year 0-10	Future [b] 11-30 Years
All Aircraft		
Day (7am to 7pm)	98%	85%
Evening (7pm to 10pm)	2%	10%
Night (10pm to 7am)	--	5%

RUNWAY USE DISTRIBUTION [A]

	At Opening Year 0-10	Future 11-30 Years
All Aircraft		
Runway 11	20%	20%
Runway 29	80%	80%
Distribution by Operation and Aircraft Type		
Takeoffs / Landings - Day/Evening/Night		
Single-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%
Twin-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%
Turboprop		
Runway 11	20%	20%
Runway 29	80%	80%
Business Jets		
Runway 11	20%	20%
Runway 29	80%	80%
Touch-and-go operations - Day/Evening/Night		
Single-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%

Flight Track Use [A]

- 100% straight-out departures
- 100% straight-in arrivals
- Tough-and-go: 100% left traffic

Notes

[a] Estimated by Mead & Hunt and ESA Airports for compatibility planning purposes.

[b] Estimate represents the theoretical capacity as established for the Draft Airport Layout Plan Narrative Report. This forecast scenario assumes full build-out of the adjacent Crows Landing Industrial Business Park. The timeframe is undefined but assumed to be beyond 2046.

Typical Decibel Level of Common Sounds

Table 4-4

Airport Activity Data Summary

Crows Landing Airport

Figure 4A
Airport Improvement Staging Plan
Crows Landing Airport

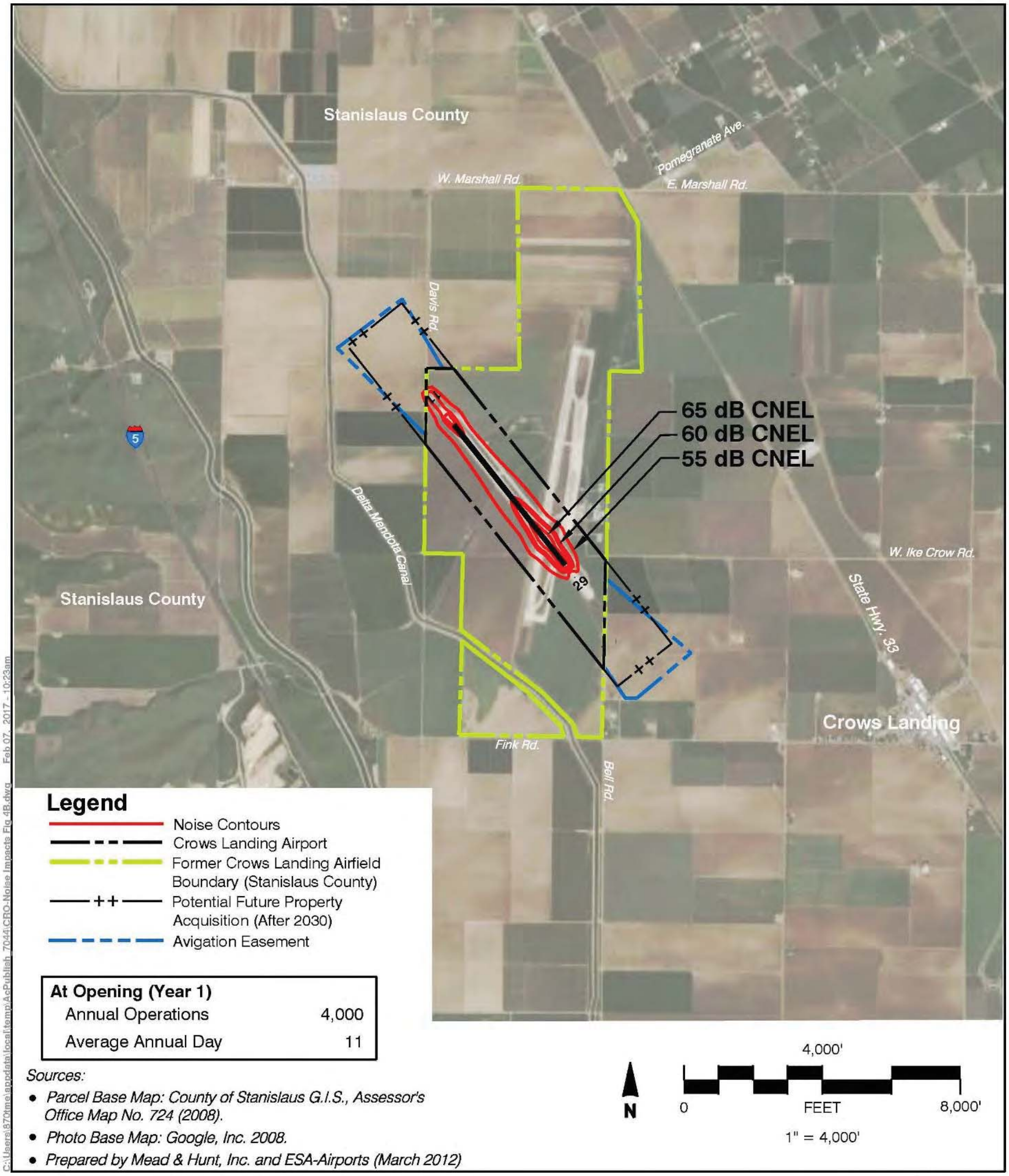


Figure 4B

Noise Impacts — At Opening (Year 1)

Crows Landing Airport

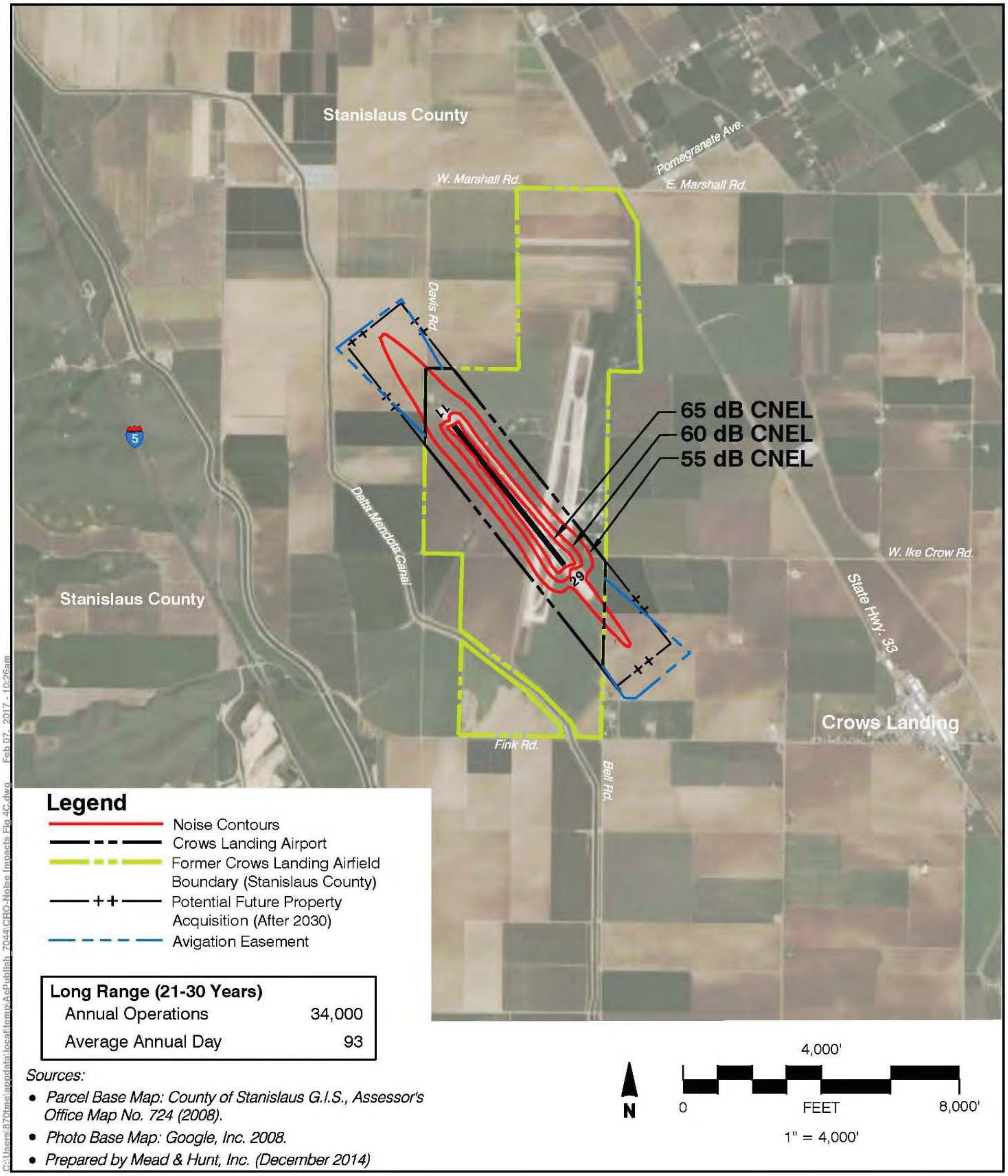


Figure 4C

Noise Impacts — Long Range (11-30 Years)

Crows Landing Airport

APPENDIX A

GLOSSARY OF TERMS

Glossary of Terms

ABOVE GROUND LEVEL (AGL): An elevation datum given in feet above ground level.

AIR CARRIER: A person who undertakes directly by lease, or other arrangement, to engage in air transportation. (FAR 1) (Also see Certificated Air Carrier)

AIR CARRIERS: The commercial system of air transportation, consisting of the certificated air carriers, air taxis (including commuters), supplemental air carriers, commercial operators of large aircraft, and air travel clubs. (FAA Census)

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. (AIM)

AIR TAXI: A classification of air carriers which directly engage in the air transportation of persons, property, mail, or in any combination of such transportation and which do not directly or indirectly utilize large aircraft (over 30 seats or a maximum payload capacity of more than 7,500 pounds) and do not hold a Certificate of Public Convenience and Necessity or economic authority issued by the Department of Transportation. (Also see commuter air carrier and demand air taxi.) (FAA Census)

AIR TRAFFIC CONTROL (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic. (FAR 1)

AIRCRAFT ACCIDENT: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. (NTSB)

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft (Categories A–E) based on 1.3 times their stall speed in their landing configuration at their maximum certificated landing weight. (Airport Design)

AIRCRAFT OPERATION: The airborne movement of aircraft in controlled or non-controlled airport terminal areas and about given en route fixes or at other points where counts can be made. There are two types of operations — local and itinerant. (FAA Stats)

AIRCRAFT PARKING LINE LIMIT (APL): A line established by the airport authorities beyond which no part of a parked aircraft should protrude. (Airport Design)

AIR/FIRE ATTACK BASE: An established on-airport base of operations for the purposes of aerial suppression of large-scale fires by specially-modified aircraft. Typically, such aircraft are operated by the California Department of Forestry and/or the U.S. Forest Service.

AIRPLANE DESIGN GROUP: A grouping of airplanes (Groups I–V) based on wingspan. (Airport Design)

AIRPORT: An area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any. (FAR 1)

AIRPORT ELEVATION: The highest point of an airport's usable runways, measured in feet above mean sea level. (AIM)

AIRPORT HAZARD: Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport. (Airport Design)

AIRPORT LAND USE COMMISSION (ALUC): A commission established in accordance with the California State Aeronautics Act in each county having an airport operated for the benefit of the general public. The purpose of each ALUC is -to assist local agencies in ensuring compatibility land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses.‖ An ALUC need not be created if an alternative process, as specified by the statutes, is established to accomplish the same purpose. (California Public Utilities Code, Section 21670 et seq.)

AIRPORT LAYOUT PLAN (ALP): A scale drawing of existing and proposed airport facilities, their location on the airport, and the pertinent clearance and dimensional information required to demonstrate conformance with applicable standards.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. (Airport Design)

AIRPORT REFERENCE POINT (ARP): A point established on an airport, having equal relationship to all existing and proposed landing and takeoff areas, and used to geographically locate the airport and for other planning purposes. (Airport Design)

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. (AIM)

AIRWAY/FEDERAL AIRWAY: A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids. (AIM)

ALERT AREA: A special use airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. (AIM)

APPROACH LIGHT SYSTEM (ALS): An airport lighting system which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended runway centerline during a final approach to landing. Among the specific types of systems are:

- **LDIN—**Lead-in Light System.
- **MALSR—**Medium-intensity Approach Light System with Runway Alignment Indicator Lights.
- **ODALS—**Omnidirectional Approach Light System, a combination of LDIN and REILS.
- **SSALR—**Simplified Short Approach Light System with Runway Alignment Indicator Lights. (AIM)

APPROACH SPEED: The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration. (AIM)

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS): Airport electronic equipment which automatically measures meteorological parameters, reduces and analyzes the data via computer, and broadcasts weather information which can be received on aircraft radios in some applications, via telephone.

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. (AIM)

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information in selected terminal areas. (AIM)

BACK COURSE APPROACH: A non-precision instrument approach utilizing the rearward projection of the ILS localizer beam.

BALANCED FIELD LENGTH: The runway length at which the distance required for a given aircraft to abort a takeoff and stop on the runway (accelerate-stop distance) equals the distance required to continue the takeoff and reach a height of 35 feet above the runway end (accelerate-go distance).

BASED AIRCRAFT: Aircraft stationed at an airport on a long-term basis.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on airports.

CEILING: Height above the earth's surface to the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration" and is not classified as "thin" or "partial". (AIM)

CERTIFICATED ROUTE AIR CARRIER: An air carrier holding a Certificate of Public Convenience and Necessity issued by the Department of Transportation authorizing the performance of scheduled service over specified routes, and a limited amount of nonscheduled service. (FAA Census)

CIRCLING APPROACH/CIRCLE-TO-LAND MANEUVER: A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable. (AIM)

COMMERCIAL OPERATOR: A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier. (FAR 1)

COMPASS LOCATOR: A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). (AIM)

COMPASS ROSE: A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction. (AIM)

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL): The noise rating adopted by the State of California for measurement of airport noise. It represents the average daytime noise level during a 24-hour day, measured in decibels and adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods.

COMMUTER AIR CARRIER: An air taxi operator which performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are performed. (FAA Census)

CONTROLLED AIRSPACE: A generic term that covers the different classifications of airspace (Class A, Class B, Class C, Class D and Class E airspace) and defines dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **Class A—**Generally, that airspace from 18,000 feet MSL up to and including 60,000 feet MSL (Flight Level 600), including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.
- **Class B—**Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspaces areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC

clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds".

- **Class C—**Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a 5 nm radius, and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.
- **Class D—**Generally, that airspace from the surface to 2,500 feet above the airport elevation (chartered in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.
- **Class E—**Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Class E airspace does not include the airspace 18,000 feet MSL or above.

DEMAND AIR TAXI: Use of an aircraft operating under Federal Aviation Regulations, Part 135, passenger and cargo operations, including charter and excluding commuter air carrier. (FAA Census)

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway. (AIM)

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid. (AIM)

FAR PART 77: The part of the Federal Aviation Regulations that deals with objects affecting navigable airspace.

FAR PART 77 SURFACES: Imaginary surfaces established with relation to each runway of an airport. There are five types of surfaces: (1) primary; (2) approach; (3) transitional; (4) horizontal; and (5) conical.

FEDERAL AVIATION ADMINISTRATION (FAA): The United States government agency that is responsible for insuring the safe and efficient use of the nation's airspace.

FIXED BASE OPERATOR (FBO): A business operating at an airport that provides aircraft services to the general public, including but not limited to sale of fuel and oil; aircraft sales, rental, maintenance, and repair; parking and tiedown or storage of aircraft; flight training; air taxi/charter operations; and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography, aerial hoists, or pipeline patrol.

FLIGHT SERVICE STATION (FSS): FAA facilities which provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information.

FRACTIONAL OWNERSHIP: A company or individual buys, or leases, a fractional interest in one aircraft just as they might acquire a partial interest in one condo unit. They can use their own aircraft or another similar or identical aircraft a certain number of hours or days per year. The economics of each situation differs depending on the number of people who will use the aircraft, the value of their time to the company, and the dollars saved in airline tickets, hotels, etc.

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers. (FAA Stats)

GENERIC VISUAL GLIDE SLOPE INDICATOR (GVGI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

GLIDE SLOPE: An electronic signal radiated by a component of an ILS to provide descent path guidance to approaching aircraft.

GLOBAL POSITIONING SYSTEM (GPS): A relatively new navigational system which utilizes a network of satellites to determine a positional fix almost anywhere on or above the earth. Developed and operated by the U.S. Department of Defense, GPS has been made available to the civilian sector for surface, marine, and aerial navigational use. For aviation purposes, the current form of GPS guidance provides en route aerial navigation and selected types of nonprecision instrument approaches. Eventual application of GPS as the principal system of navigational guidance throughout the world is anticipated.

HELIPAD: A small, designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters. (AIM)

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority. (AIM)

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also term used by pilots and controllers to indicate a type of flight plan. (AIM)

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids: (1) Localizer; (2) Glide Slope; (3) Outer Marker; (4) Middle Marker; (5) Approach Lights. (AIM)

INSTRUMENT OPERATION: An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility. (FAA ATA)

INSTRUMENT RUNWAY: A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minimums has been approved. (AIM)

ITINERANT OPERATION: An arrival or departure performed by an aircraft from or to a point beyond the local airport area.

LARGE AIRCRAFT: An aircraft of more than 12,500 pounds maximum certificated takeoff weight. (FAR 1)

LIMITED REMOTE COMMUNICATIONS OUTLET (LRCO): An unmanned, remote air/ground communications facility which may be associated with a VOR. It is capable only of receiving communications and relies on a VOR or a remote transmitter for full capability.

LOCALIZER (LOC): The component of an ILS which provides course guidance to the runway. (AIM)

LOCAL OPERATION: An arrival or departure performed by an aircraft: (1) operating in the traffic pattern, (2) known to be departing or arriving from flight in local practice areas, or (3) executing practice instrument approaches at the airport. (FAA ATA)

LORAN: An electronic ground-based navigational system established primarily for marine use but used extensively for VFR and limited IFR air navigation.

MARKER BEACON (MB): The component of an ILS which informs pilots, both aurally and visually, that they are at a significant point on the approach course.

MEAN SEA LEVEL (MSL): An elevation datum given in feet from mean sea level.

MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM (MALS): The MALS is a configuration of steady-burning lights arranged symmetrically about and along the extended runway centerline. MALS may also be installed with sequenced flashers — in this case, the system is referred to as MALSF.

MILITARY OPERATIONS AREA (MOA): A type of special use airspace of defined vertical and lateral dimensions established outside of Class A airspace to separate/segregate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. (AIM)

MINIMUM DESCENT ALTITUDE (MDA): The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided. (FAR 1)

MISSED APPROACH: A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. (AIM)

NAVIGATIONAL AID/NAVAID: Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight. (AIM)

NONDIRECTIONAL BEACON (NDB): A 4 MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" on or track to or from the station. (AIM)

NONPRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided. (FAR 1)

NONPRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in nonprecision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned. (Airport Design)

OBJECT FREE AREA (OFA): A surface surrounding runways, taxiways, and taxilanes which should be clear of parked airplanes and objects except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (Airport Design)

OBSTACLE: An existing object, object of natural growth, or terrain at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation. (AIM)

OBSTACLE FREE ZONE (OFZ): A defined volume of airspace above and adjacent to a runway and its approach lighting system if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION: An object/obstacle, including a mobile object, exceeding the obstruction standards specified in FAR Part 77, Subpart C. (AIM)

OUTER MARKER: A marker beacon at or near the glide slope intercept position of an ILS approach. (AIM)

PRECISION APPROACH PATH INDICATOR (PAPI): An airport visual landing aid similar to a VASI, but which has light units installed in a single row rather than two rows.

PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which an electronic glide slope is provided, such as an ILS or PAR. (FAR 1)

PRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), or precision approach radar (PAR). (Airport Design)

RELOCATED THRESHOLD: The portion of pavement behind a relocated threshold that is not available for takeoff and landing. It may be available for taxiing and aircraft. (Airport Design)

REMOTE COMMUNICATIONS AIR/GROUND FACILITY (RCAG): An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. (AIM)

REMOTE COMMUNICATIONS OUTLET (RCO) AND REMOTE TRANSMITTER/ RECEIVER (RTR): An unmanned communications facility remotely controlled by air traffic personnel. RCO's serve FSS's. RTR's serve terminal ATC facilities. (AIM)

RESTRICTED AREA: Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction. (FAR 1)

RUNWAY CLEAR ZONE: A term previously used to describe the runway protection zone.

RUNWAY EDGE LIGHTS: Lights used to define the lateral limits of a runway. Specific types include:

- **HIRL—**High-Intensity Runway Lights.
- **MIRL—**Medium-Intensity Runway Lights.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway. (AIM)

RUNWAY PROTECTION ZONE (RPZ): A trapezoidal shaped area at the end of a runway, the function of which is to enhance the protection of people and property on the ground through airport owner control of the land. The RPZ usually begins at the end of each primary surface and is centered upon the extended runway centerline. (Airport Design)

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the even of an undershoot, overshoot, or excursion from the runway. (Airport Design)

SMALL AIRCRAFT: An aircraft of 12,500 pounds or less maximum certificated takeoff weight. (FAR 1)

SPECIAL USE AIRSPACE: Airspace of defined horizontal and vertical dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. (AIM)

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SID's provide transition from the terminal to the appropriate en route structure. (AIM)

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned instrument flight rule (IFR) air traffic control arrival route published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area. (AIM)

STOPWAY: An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. (FAR 1)

STRAIGHT-IN INSTRUMENT APPROACH — IFR: An instrument approach wherein final approach is begun without first having executed a procedure turn; it is not necessarily completed with a straight-in landing or made to straight-in landing weather minimums. (AIM)

TAXILANE: The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc. (Airport Design)

TAXIWAY: A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft. (Airport Design)

TERMINAL INSTRUMENT PROCEDURES (TERPS): Procedures for instrument approach and departure of aircraft to and from civil and military airports. There are four types of terminal instrument procedures: precision approach, nonprecision approach, circling, and departure.

TERMINAL RADAR SERVICE AREA (TRSA): Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. (AIM)

THRESHOLD: The beginning of that portion of the runway usable for landing. (AIM)

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is defined as two operations. (AIM)

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach. (AIM)

TRANSIENT AIRCRAFT: Aircraft not based at the airport.

TRANSMISSOMETER: An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. (AIM)

UNCONTROLLED AIRSPACE: Now known as Class G airspace. Class G airspace is that portion of the airspace that has not been designated as Class A, Class B, Class C, Class D, and Class E airspace.

UNICOM (Aeronautical Advisory Station): A nongovernment air/ground radio communication facility which may provide airport information at certain airports. (AIM)

VERY-HIGH-FREQUENCY OMNIDIRECTIONAL RANGE (VOR): The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Distance Measuring Equipment (DME) or Tactical Air Navigation (TACAN) the facility, called VOR-DME or VORTAC, provides distance as well as bearing information.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport landing aid which provides a pilot with visual descent (approach slope) guidance while on approach to landing. Also see PAPI.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used by pilots and controllers to indicate type of flight plan. (AIM)

VISUAL GLIDE SLOPE INDICATOR (VGSI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

VISUAL RUNWAY: A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan. (Airport Design)

WARNING AREA: A type of special use airspace which may contain hazards to nonparticipating aircraft in international airspace. (AIM)

SOURCES

FAR 1: Federal Aviation Regulations Part 1, Definitions and Abbreviations. (1993)

AIM: Airman's Information Manual, Pilot/Controller Glossary. (1993)

Airport Design: Federal Aviation Administration. *Airport Design*. Advisory Circular 150/5300-13, Change 7. (2002)

FAA ATA: Federal Aviation Administration. *Air Traffic Activity*. (1986)

FAA Census: Federal Aviation Administration. *Census of U.S. Civil Aircraft*. (1986)

FAA Stats: Federal Aviation Administration. *Statistical Handbook of Aviation*. (1984)

NTSB: National Transportation Safety Board. *U.S. NTSB 830-3.* (1989)

Appendix B

Aircraft Owner Survey

OVERVIEW

In an effort to assess the potential user demand for Crows Landing Airport (Airport), Aviation Management Consulting Group (AMCG) and Mead & Hunt developed and implemented an Aircraft Owner Survey (Survey) of aircraft owners located within a 40 nautical mile radius of the Airport, and piston, turboprop, and turbojet aircraft owners within a 75 nautical mile radius of the Airport. A total of 922 postcards were mailed to aircraft owners (690 to piston aircraft owners and 232 to turboprop and turbojet aircraft owners) inviting them to participate in the Survey.

The Survey was made available for completion and submission on a dedicated website created and managed by AMCG. The postcards inviting aircraft owner participation were mailed on January 4, 2006. hardcopies of the Survey were also made available to aircraft owners upon request. The response deadline for the Survey was January 27, 2006. As an incentive to complete and submit the Survey, each respondent to the Survey was offered the opportunity to be entered into a drawing for the chance to win an aviation gift certificate valued at $250.

Of the 922 postcards mailed 76 postcards (8.2%), 64 addressed to piston aircraft owners and 12 addressed to turboprop and turbojet aircraft owners) were returned due to erroneous addresses. This erroneous address rate is not surprising considering the FAA's registration methodology and the frequent changes in some aircraft ownership arrangements. Therefore, the total number of Surveys "received" by aircraft owners equaled 846 (626 piston aircraft owners and 220 turboprop and turbojet aircraft owners).

The Survey, developed by AMCG and Mead & Hunt, was designed to assess the factors that influence aircraft owners within the Airport market on their selection of home (based) airports, and the potential for Survey respondents (aircraft owners) to relocate their aircraft to the Airport. Under the first section of the Survey (Questions 1-22), respondents were asked to rate influencing factors from 1 (unimportant) to 6 (very important). The second section of the Survey allowed respondents to select among various response options to answer questions about their interest level in relocating to the Airport, building a hangar on the Airport, or starting a business on the Airport. Finally, respondents were offered the opportunity to express any "additional comments" in written form.

A total of 55 Survey responses were received (54 from piston aircraft owners and only 1 from a turbojet aircraft owner). This equates to a total response rate of 6.5% (8.6% piston aircraft owners and 0.5% turboprop or turbojet aircraft owners) of the total Surveys "received".

A 10% to 20% response rate is generally considered typical for airport related surveys. These surveys typically survey airport users (aircraft owners) that are based at the subject airport and therefore have a vested interest in the outcome of the survey results. Statistically, a 10% to 20% response rate is sufficient to draw reasonable correlation to the other airport users (aircraft owners). However, since the aircraft owners surveyed in this Survey do not have a direct vested interest in the Airport, it is not surprising to see the lower response rate. In fact, in reviewing the FAA's aircraft owners list it appears that there could be numerous financing and leasing companies that "own" turboprop and turbojet aircraft that most likely are not operating the aircraft that they own and therefore would have little to no interest in responding to the Survey.

However, since nearly all respondents were piston aircraft owners, an 8.6% response rate is nearing the lower acceptable response rate level to draw reasonable correlations. However, we would caution the County on extrapolating the results of this survey over the entire population of 626 piston aircraft owners.

Following are some highlights of the 55 survey responses received:

- Aircraft owners own a total of 69 aircraft (64 single engine piston aircraft, four multi-engine piston aircraft, and one turbojet powered aircraft).
- Forty-eight (48) aircraft owners (87%) operate their aircraft solely for non-commercial purposes.
- Zero (0) aircraft owners operate their aircraft solely for commercial purposes only.
- Five (5) aircraft owners (9%) operate their aircraft for both commercial and non-commercial purposes.
- Two (2) aircraft owners (4%) did not specify the use of their aircraft.
- Fifty-six (56) aircraft (81%) are based within 40 miles of Crows Landing Airport.

Conclusions

The following conclusions are based on a combined review and analysis of the Survey responses by AMCG and Mead & Hunt.

The first 21 questions of the Survey assessed the importance of factors which influence the decision of aircraft owners on where to base their aircraft. Within the responses to these questions, there were no surprises. The respondents to the Survey were primarily non-commercial (recreational/pleasure and business) owners of small, piston aircraft who have a rather predictable array of important factors, including fuel availability and price, aircraft storage availability and price, roadway access, vehicle parking availability, and basic airfield components such a lighting.

The last nine questions allowed the respondent to choose options regarding their interest level in relocating their aircraft to Crows Landing Airport, building a facility at the Airport, and establishing a business at the Airport. Of the responses received, there seemed to be a relatively high amount of interest in relocating to Crows Landing Airport and establishing a business at the Airport. Of the responses received, there seemed to be a relatively high amount of interest in relocating to Crows Landing Airport and establishing facilities or businesses there. According to the additional testimonial comments, this interest was in large part conditional on price of products/services/facilities offered at the Airport. This is to be expected when considering that the vast majority of the respondents were non-commercial (recreational/pleasure and business) aircraft owners and operators who are typically very price sensitive.

Based upon the findings of this survey, AMCG and Mead & Hunt believe it is reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation as a public use airport. Additional aircraft, primarily small, piston aircraft, may relocate to the Airport in subsequent years, as services and facilities at the Airport are further developed.

Additional Observations by Mead & Hunt

Overall, we found the Survey process and subsequent responses to be fully consistent with our initial expectations and experience. Our specific observations and reactions regarding the Survey (over and above our analysis as presented in the survey analysis report) are as follows:

- The relatively low Total Response Rate of 6.5% was about as we expected. We surveyed general aviation aircraft owners in the vicinity of Crows Landing Airport (both personal/recreational aircraft and business/corporate aircraft owners) – none of whom has a vested interest in the Airport. Therefore, their interest in responding to the survey would likely be minimal.
- The large majority of responses received were from personal/recreational aircraft owners who are typically very price sensitive. Such owners would likely consider relocating to another airport only if their operating costs (e.g., hangar, fuel, maintenance, etc.) at the new airport were significantly lower than the costs at their current base of operations.
- It is our expectation that Crows Landing Airport can be developed and operated as a publicly-owned/public-use general aviation airport that complies with federal (Federal Aviation Administration – FAA) and state (California Division of Aeronautics – CDOA) design standards and operational requirements.
- We believe it reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation as a basic (i.e., at least one hard-surface runway, night lighting, security, basic storage hangars, and fuel) public-use general aviation facility. If the Airport is to attract additional based and transient aircraft, it will have to be further improved with instrument approach capability (initially, GPS based nonprecision), aircraft maintenance services, and more storage hangars. In addition, planned commercial development in the area surrounding the Airport will likely lead to increased aviation activity at the Airport in the years ahead.
- To qualify for airport planning and development grants from the FAA, an airport must be included in the FAA's National Plan for Integrated Airport Systems (NPIAS). Crows Landing Airport, as a former military-use only facility, is not currently listed in the NPIAS. To be considered for inclusion within the NPIAS, an airport must usually have at least ten (10) locally-based aircraft. However, this activity criterion may be relaxed by the FAA for a remote location or other mitigating circumstances.
- Considering that some 67% (37 respondents) of the Survey respondents were moderately-to-very interested in relocating to (i.e., basing their aircraft at) Crows Landing Airport, we believe it reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation. We suggest that this level of anticipated based aircraft activity is sufficient to justify the inclusion of Crows Landing Airport as a General Aviation facility within the current NPIAS.

Appendix C

Airport Layout Plan Drawings

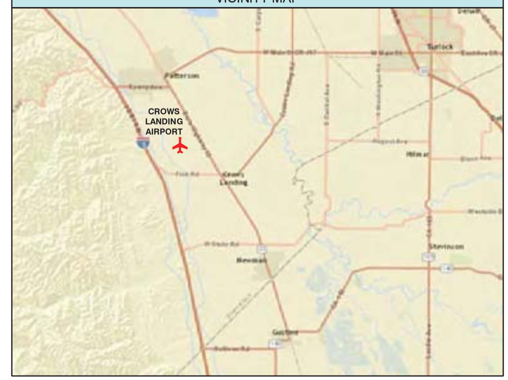
Crows Landing Airport
Airport Layout Plan
Stanislaus County, California
February 2017

LOCATION MAP

SHEET INDEX

1. INDEX
2. AIRPORT LAYOUT PLAN
3. AIRPORT DATA
4. PART 77 AIRSPACE PLAN
5. INNER APPROACH PLAN & PROFILE
6. EXHIBIT 'A' PROPERTY MAP

VICINITY MAP



CALIFORNIA STATE MAP

SUBMITTED BY:
COUNTY OF STANISLAUS

By ____________________

Title ____________________ Date ____________________

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

INDEX

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 1 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

BUILDING AND FACILITY LEGEND

FACILITY	ELEVATION
1 Future Operations Office	162'
2 Fixed Base Operator (FBO)	162'
3 Fuel Facility	N/A
4 Future Wash Rack	N/A
5 Future Runway End Indicator Lights (REILS)	N/A
6 Future Medium Intensity Approach Light System With Rail (MALSR)	N/A
7 Future Rotating Beacon	197'

MONUMENTS (e)

	ID #	LATITUDE	LONGITUDE	ELEVATION	DESCRIPTION
1	HS5483	37° 24' 46.766" N	121° 06' 20.756" W	142.00'	Brass survey disk
2	HS5478	37° 24' 13.062" N	121° 06' 37.571" W	162.00'	Brass survey disk
3	HS5474	37° 23' 57.775" N	121° 06' 40.989" W	173.00'	Stainless steel rod
4	HS5477	37° 24' 48.034" N	121° 06' 29.765" W	144.00'	Brass survey disk

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- Magnetic Declination source: National Geophysical Data Center.

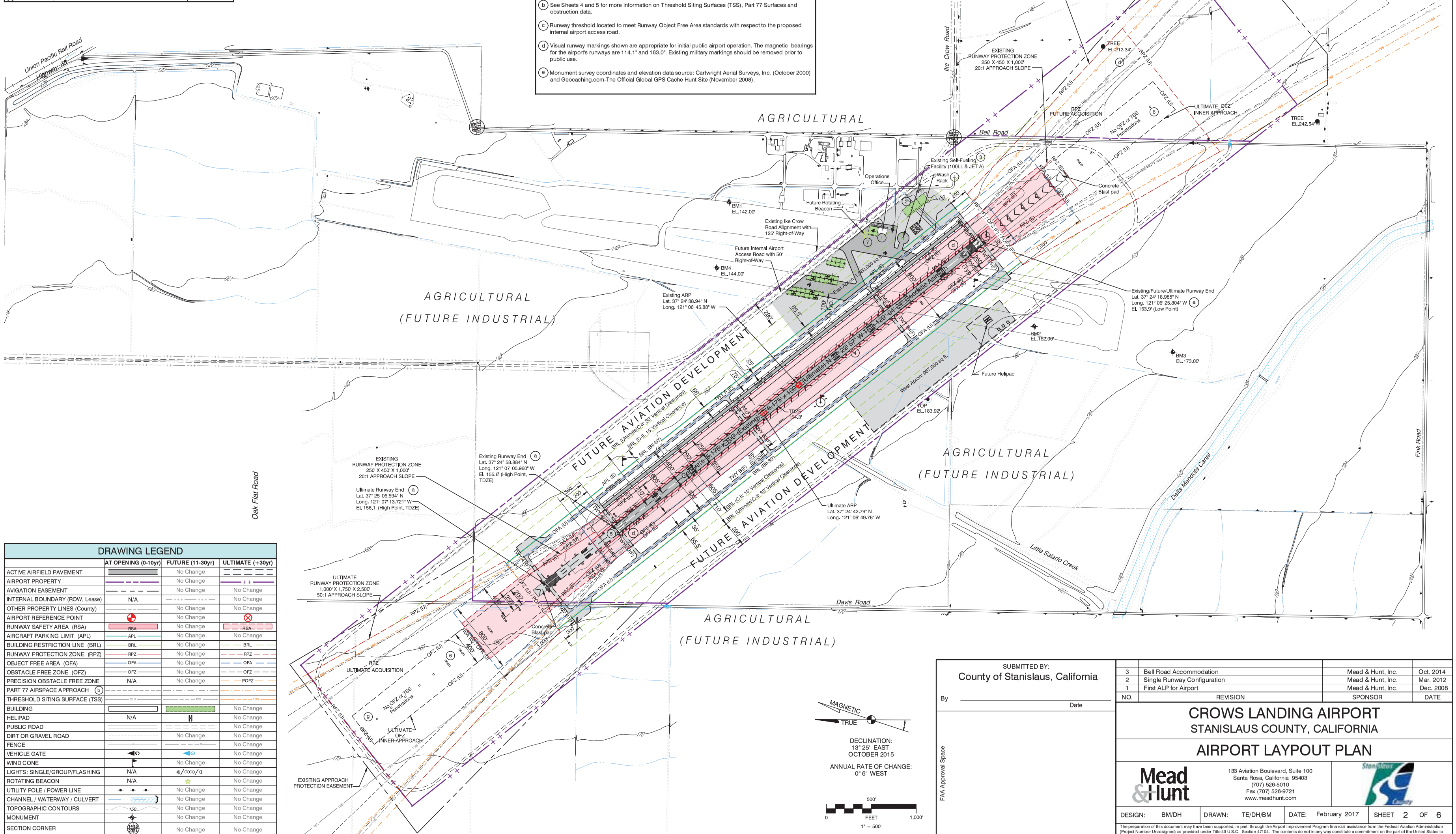
(a) Airport coordinate and elevation data source: Photogrammetric survey conducted by Cartwright Aerial Surveys, Inc. (October 2000) and field survey by Mead & Hunt, Inc. (October 2008). Coordinates are NAD83. Elevations are NAVD88. Geodetic Azimuth is reckoned clockwise from true north.

(b) See Sheets 4 and 5 for more information on Threshold Siting Surfaces (TSS), Part 77 Surfaces and obstruction data.

(c) Runway threshold located to meet Runway Object Free Area standards with respect to the proposed internal airport access road.

(d) Visual runway markings shown are appropriate for initial public airport operation. The magnetic bearings for the airport's runways are 114.1° and 163.0°. Existing military markings should be removed prior to public use.

(e) Monument survey coordinates and elevation data source: Cartwright Aerial Surveys, Inc. (October 2000) and Geocaching.com-The Official Global GPS Cache Hunt Site (November 2008).



DRAWING LEGEND

	AT OPENING (0-10yr)	FUTURE (11-30yr)	ULTIMATE (+30yr)
ACTIVE AIRFIELD PAVEMENT		No Change	
AIRPORT PROPERTY		No Change	
AVIGATION EASEMENT		No Change	No Change
INTERNAL BOUNDARY (ROW, Lease)	N/A		No Change
OTHER PROPERTY LINES (County)		No Change	No Change
AIRPORT REFERENCE POINT		No Change	
RUNWAY SAFETY AREA (RSA)	RSA	No Change	RSA
AIRCRAFT PARKING LIMIT (APL)	APL	No Change	No Change
BUILDING RESTRICTION LINE (BRL)	BRL	No Change	BRL
RUNWAY PROTECTION ZONE (RPZ)	RPZ	No Change	RPZ
OBJECT FREE AREA (OFA)	OFA	No Change	OFA
OBSTACLE FREE ZONE (OFZ)	OFZ	No Change	OFZ
PRECISION OBSTACLE FREE ZONE	N/A	No Change	POFZ
PART 77 AIRSPACE APPROACH (b)			
THRESHOLD SITING SURFACE (TSS)	TSS	TSS	TSS
BUILDING			No Change
HELIPAD	N/A	H	No Change
PUBLIC ROAD			No Change
DIRT OR GRAVEL ROAD		No Change	No Change
FENCE			No Change
VEHICLE GATE			No Change
WIND CONE		No Change	No Change
LIGHTS: SINGLE/GROUP/FLASHING	N/A		No Change
ROTATING BEACON	N/A		No Change
UTILITY POLE / POWER LINE		No Change	No Change
CHANNEL / WATERWAY / CULVERT		No Change	No Change
TOPOGRAPHIC CONTOURS	150	No Change	No Change
MONUMENT		No Change	No Change
SECTION CORNER	14 13 23 24	No Change	No Change

C:\Users\870tme\appdata\local\temp\AcPublish_596\Crows.ALP2017.LayoutPlan-CURRENT.dwg Feb 27, 2017 - 3:18pm

MAGNETIC
TRUE
DECLINATION:
13° 25' EAST
OCTOBER 2015
ANNUAL RATE OF CHANGE:
0° 6' WEST

0 500' 1,000'
FEET
1" = 500'

SUBMITTED BY:
County of Stanislaus, California

By ______________________ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

AIRPORT LAYPOUT PLAN

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 2 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

RUNWAY DATA

		RUNWAY 11-29					
		AT OPENING (0-10yr)		FUTURE (10-30yr)		ULTIMATE (+30yr)	
UTILITY / GREATER THAN UTILITY		Greater Than Utility		No Change		No Change	
RUNWAY DESIGN CODE		B-II-VIS		B-II-5000		C-II-2400	
APPROACH REFERENCE CODE		B-II-VIS		B-II-5000		C-II-2400	
CRITICAL AIRCRAFT	AIRCRAFT	King Air 200		No Change		Gulfstream III	
	WINGSPAN	54.5'		No Change		77.8'	
	APPROACH SPEED (kts)	103		No Change		136	
	MAX. TAKEOFF WT. (lbs.)	12,500		No Change		69,700	
	COCKPIT TO MAIN GEAR	<10'		No Change		N/A	
	MAIN GEAR WIDTH	17.1'		No Change		N/A	
	TAXIWAY DESIGN GROUP	2		No Change		No Change	
PAVEMENT STRENGTH AND MATERIAL TYPE	SURFACE MATERIAL	Concrete		No Change		No Change	
	DESIGN STRENGTH (1,000#) - S/D/DT	65/75/135		No Change		30/55/-	
	STRENGTH BY PCN	N/A		No Change		No Change	
	SURFACE TREATMENT	None		No Change		No Change	
EFFECTIVE GRADIENT (%)		0.03%		No Change		No Change	
VERTICAL LINE OF SIGHT PROVIDED		Yes		No Change		No Change	
RUNWAY LENGTH		5,175'		No Change		6,175'	
RUNWAY WIDTH		100'		No Change		No Change	
DISPLACED THRESHOLD		11	None	11	No Change	11	No Change
		29	None	29	No Change	29	No Change
RUNWAY END ELEVATIONS (a)		11	155.6'	11	No Change	11	156.1' (est)
		29	153.9'	29	No Change	29	No Change
RUNWAY TOUCHDOWN ZONE ELEVATIONS (a)		11	155.6'	11	No Change	11	156.1' (est)
		29	154.3'	29	No Change	29	No Change
RUNWAY HIGH POINT (a)		155.6'		No Change		156.1' (est)	
RUNWAY LOW POINT (a)		153.9'		No Change		No Change	
RUNWAY SAFETY AREA (RSA) LENGTH BEYOND RUNWAY END	REQUIRED	11	300'	11	No Change	11	1,000'
		29	300'	29	No Change	29	1,000'
	ACTUAL	11	300'	11	No Change	11	1,000'
		29	300'	29	No Change	29	1,000'
RUNWAY SAFETY AREA WIDTH	REQUIRED	150'		No Change		500'	
	ACTUAL	150'		No Change		500'	
RUNWAY EDGE LIGHTING		None		Medium Intensity		No Change	
RUNWAY PROTECTION ZONE (RPZ) (Inner Width x Outer Width x Length)		11	250' x 450' x 1,000'	11	No Change	11	1000'x1750'x2500'
		29	250' x 450' x 1,000'	29	No Change	29	1000'x1750'x2500'
RUNWAY MARKING		11	Visual / Basic	11	Non-Precision	11	Precision
		29	Visual / Basic	29	Non-Precision	29	Precision
PART 77 APPROACH CATEGORY (d)		11	Visual [B(V)]	11	Non-Prec [C]	11	Precision [PIR]
		29	Visual [B(V)]	29	Non-Prec [C]	29	Precision [PIR]
PART 77 APPROACH SLOPE (d)		11	20:1	11	34:1	11	50:1
		29	20:1	29	34:1	29	50:1
APPROACH VISIBILITY MINIMUMS		11	Visual	11	≥1 Mile	11	1/2 Mile
		29	Visual	29	≥1 Mile	29	1/2 Mile
AERONAUTICAL SURVEY REQUIRED (VERTICALLY GUIDED OR NOT)		11	Not V.G.	11	Vertically Guided	11	No Change
		29	Not V.G.	29	Vertically Guided	29	No Change
RUNWAY DEPARTURE SURFACE		11	None	11	40:1	11	No Change
		29	None	29	40:1	29	No Change
RUNWAY OBJECT FREE AREA (ROFA) (Length Beyond Runway End)		11	300'	11	No Change	11	1,000'
		29	300'	29	No Change	29	1,000'
RUNWAY OBJECT FREE AREA WIDTH		500'		No Change		800'	
OBSTACLE FREE ZONE (OFZ) (Length Beyond Runway End)		11	200'	11	No Change	11	No Change
		29	200'	29	No Change	29	No Change
OBSTACLE FREE ZONE WIDTH		400'		No Change		No Change	
INNER-APPROACH OFZ LENGTH (For Rwys w/ Approach Lighting System. Begins 200' from Rwy end @ 50:1		11	N/A	11	No Change	11	2,400'
		29	N/A	29	No Change	29	2,400'
INNER-APPROACH OFZ WIDTH		N/A		No Change		400'	
INNER-TRANSITIONAL OFZ WIDTH (For Runways w/ <3/4-mile Approach Visibility Minimums. Dimension is length from edge of Runway OFZ to outer edge of Transitional OFZ.)		11	N/A	11	No Change	11	581'
		29	N/A	29	No Change	29	581'
PRECISION OBSTACLE FREE ZONE (Length x Width) (For Rwys w/vert. guided approach and <250' ceiling/<3/4 mile visibility)		11	N/A	11	No Change	11	200' x 800'
		29	N/A	29	No Change	29	200' x 800'
THRESHOLD SITING SURFACE (d) (Per AC 150/5300-13A, Table 3-2 - Change 1. See Airspace Plan for more information.)		11	20:1-Approach end serve large airplanes, or instrument minimums ≥ 1 statute mile, day only.	11	20:1-Approach end to support instrument night ops, Approach Cat A&B aircraft only.	11	34:1-Approach end to accommodate inst. min <¾ statute mile, or precision approach.
		29	20:1-Approach end serve large airplanes, or instrument minimums ≥ 1 statute mile, day only.	29	20:1-Approach end to support instrument night ops, Approach Cat A&B aircraft only.	29	34:1-Approach end to accommodate inst. min <¾ statute mile, or precision approach.
NAVIGATION AIDS		11	None	11	GPS	11	ILS - GPS Based
		29	None	29	GPS	29	ILS - GPS Based
VISUAL AIDS		11	None	11	PAPI/REILs	11	No Change
		29	None	29	PAPI/REILs	29	No Change
RUNWAY C.L. TO:	PARALLEL RUNWAY C.L.	N/A		No Change		No Change	
	HOLDING POSITION	200'		No Change		250'	
	PARALLEL TAXIWAY C.L.	290'		No Change		400'	
	AIRCRAFT PARKING AREA	465'		No Change		No Change	
	HELICOPTER TOUCHDOWN PAD	N/A		No Change		No Change	

AIRPORT DATA

		AT OPENING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
AIRPORT IDENTIFIER		N/A	No Change	No Change
AIRPORT REFERENCE CODE		B-II-VIS	B-II-5000	C-II-2400
MEAN MAX. TEMP. (Hottest Month) (b)		97.3° F (July)	No Change	No Change
AIRPORT ELEVATION (Above Mean Sea Level) (a)		155.6'	No Change	156.1' (est)
AIRPORT NAVIGATIONAL AIDS		Seg.Circle	Beacon, Seg.Circle, GPS, PAPI, REILs	Same+ ILS (GPS based)
AIRPORT REFERENCE POINT (a)	LATITUDE	37° 24' 38.94" N	No Change	37° 24' 42.79" N
	LONGITUDE	121° 06' 45.88" W	No Change	121° 06' 49.76" W
MISCELLANEOUS FACILITIES		None	Jet and 100LL Fuel	No Change
CRITICAL AIRCRAFT		King Air 200	No Change	Gulfstream III
MAGNETIC DECLINATION (c)		13° 25' East October 2015	Moving 0° 6' West / Year	No Change
NPIAS SERVICE LEVEL		N/A	No Change	No Change
STATE SERVICE LEVEL		N/A	Community	No Change
AIRPORT ACREAGE (e)	Fee Simple	372 acres	No Change	578 acres
	Avigation Easement	232 acres	No Change	No Change

RUNWAY END COORDINATES (a)

		AT OPENING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
11	LAT.	37° 24' 58.884" N	No Change	37° 25' 06.594" N
	LONG.	121° 07' 05.960" W	No Change	121° 07' 13.721" W
29	LAT.	37° 24' 18.985" N	No Change	No Change
	LONG.	121° 06' 25.804" W	No Change	No Change

TAXIWAY DATA

	A		B		CONNECTOR TWYS ^	
	OPENING	FUTURE	OPENING	FUTURE	OPENING	FUTURE
TAXIWAY DESIGN GROUP	2	No Change	N/A	2	2	No Change
AIRCRAFT DESIGN GROUP	II	No Change	N/A	II	II	No Change
WIDTH	75'	35'	N/A	35'	75'	35'
TAXIWAY SAFETY AREA WIDTH	79'	No Change	N/A	79'	79'	No Change
TAXIWAY OBJECT FREE AREA WIDTH	131'	No Change	N/A	131'	131'	No Change
DISTANCE from TWY. ℄ to FIXED/MOVABLE OBJECT	66.5'	No Change	N/A	66.5'	66.5'	No Change
TAXIWAY WINGTIP CLEARANCE	26'	No Change	N/A	26'	26'	No Change
DISTANCE from RUNWAY ℄ to TAXIWAY ℄	290'	400'	N/A	400'	N/A	No Change
DISTANCE FROM RUNWAY ℄ to HOLD BARS*	200'	250'	N/A	250'	250'	No Change
TAXIWAY SURFACE TYPE	Asphalt	No Change	N/A	Asphalt	Asphalt	No Change
TAXIWAY LIGHTING	None	No Change	N/A	None	None	No Change

NOTES:
* Ultimate hold lines to be implemented for ultimate precision approach. Hold lines to remain at 200 feet from Runway centerline in Future phase.
^ Connector taxiways include existing and future connector taxiways between the runway and parallel Taxiways A and B.

DATA NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."

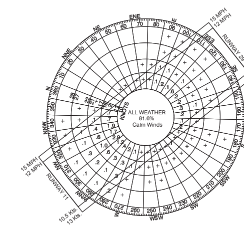
(a) Airport coordinate and elevation data source: Photogrammetric survey conducted by Cartwright Aerial Surveys, Inc. (October 2000) and field survey by Mead & Hunt, Inc. (October 2008). Coordinates are NAD83. Elevations are NAVD88. Geodetic Azimuth is reckoned clockwise from true north.

(b) Temperature data source: Western Regional Climate Center. Newman, CA Station #046168.

(c) Magnetic Declination source: National Geophysical Data Center.

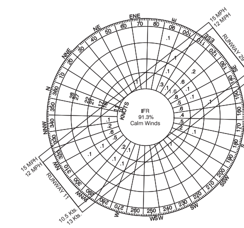
(d) See Sheets 4 and 5 for more information on Threshold Siting Surfaces (TSS), Part 77 Surfaces and obstruction data.

(e) Property and easement calculations based on property lines provided by Stanislaus County. To view all future property and easements, see Exhibit 'A' Property Map, Sheet 6.



ALL WEATHER WIND ROSE

IFR WIND COVERAGE		
Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
11-29	98.3%	99.3%



IFR CONDITIONS WIND ROSE

IFR WIND COVERAGE		
Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
11-29	99.3%	99.8%

WIND ROSE

Source: National Climatic Data Center, Asheville, NC
Crows Landing Station - Stanislaus County, California
Period: January 1978 to December 1987
Observation: 6,242
Visibility: All Weather and IFR Conditions

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

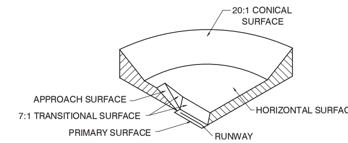
CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

AIRPORT DATA

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH DRAWN: TE/DH/BM DATE: February 2017 SHEET 3 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.



TYPICAL FAR PART 77 SURFACES

LEGEND

- Existing Runway
- Future Runway Extension
- FAR Part 77 Surfaces (Future with Non Precision Approach and Runway Extension)
- FAR Part 77 Surfaces (Future with Non Precision Approach)
- Threshold Siting Surface (TSS) ((Future with Non Precision Approach)
- Threshold Siting Surface (TSS) (Future with Non Precision Approach and Runway Extension)
- Airport Property Boundary (Existing)
- Airport Property Boundary (Future)
- Terrain Contours
- Part 77 Surface Penetration
- (e) Estimated

NOTES:

- Airspace surfaces shown for Future Phase (30 year plan) configuration of the Airport. This includes Non-Precision instrument approaches to a 'greater than utility' runway (NP[C]). For interests of land use protection, Airspace Plan also includes 1,000' extension to the approach end of Runway 11. See ALP sheets 2 and 3 for more information on phasing.
- All elevations in feet above mean sea level (MSL).

SOURCES:

USGS Topographic Maps.
Photogrammetric Survey by Cartwright Aerial Surveys, Inc. (Oct. 2000) and Field Survey by Mead & Hunt, Inc. (October 2008)

MAGNETIC
TRUE
DECLINATION:
13° 25' EAST
OCTOBER 2015

ANNUAL RATE OF CHANGE:
0° 6' WEST

0 2,000' 4,000'
FEET
1" = 2,000'

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

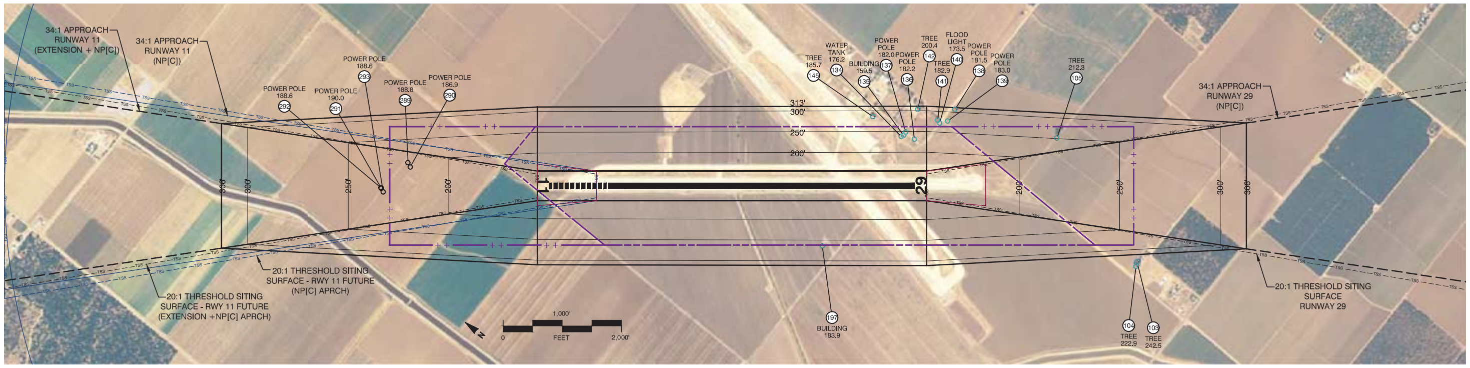
CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

PART 77 AIRSPACE PLAN

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 4 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.



LEGEND

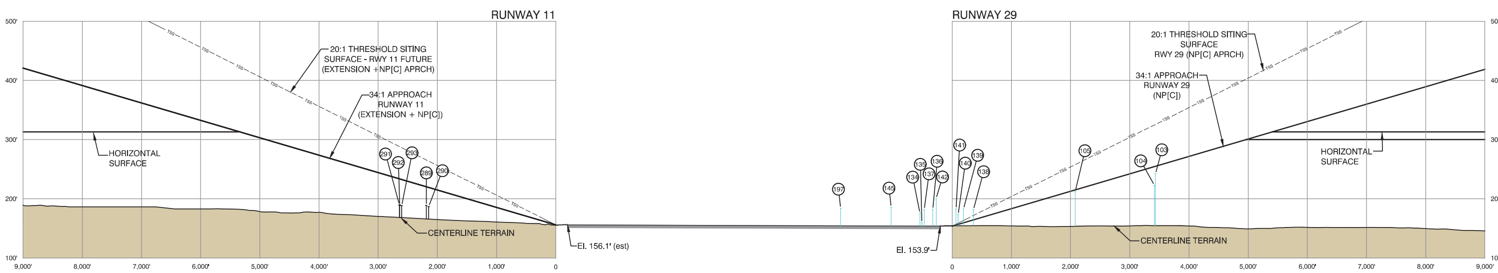
- Existing Runway
- Future Runway Extension
- FAR Part 77 Surfaces (Future with Non Precision Approach and Runway Extension)
- FAR Part 77 Surfaces (Future with Non Precision Approach)
- Threshold Siting Surface (TSS) ((Future with Non Precision Approach)
- Threshold Siting Surface (TSS) (Future with Non Precision Approach and Runway Extension
- Airport Property Boundary (Existing)
- Airport Property Boundary (Future)
- Object penetrates indicated surface.
- Object falls outside or below indicated surface.
- Poles estimated to be 30 feet in height.
- 15 feet vertical clearance added to road elevations and 17 feet vertical clearance added to railroads.

NOTES:

- Airspace surfaces shown for Future Phase (30 year plan) configuration of the Airport. This includes Non-Precision instrument approaches to a 'greater than utility' runway (NP[C]). For interests of land use protection, Airspace Plan also includes 1,000' extension to the approach end of Runway 11. See ALP sheets 2 and 3 for more information on phasing.
- All elevations in feet above mean sea level (MSL).

SOURCES:

USGS Topographic Maps.
Photogrammetric Survey by Cartwright Aerial Surveys, Inc. (Oct. 2000) and Field Survey by Mead & Hunt, Inc. (October 2008)



OBSTRUCTION DATA

POINT #	DESCRIPTION	TOP ELEVATION IN FEET (MSL)	AFFECTED PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 SURFACE PENETRATION	THRESHOLD SITING SURFACE ELEVATION	THRESHOLD SITING SURFACE PENETRATION	DISPOSITION
103	TREE	242.5	HORIZONTAL	313.0	-70.5	N/A	N/A	-
104	TREE	222.9	HORIZONTAL	313.0	-90.1	N/A	N/A	-
105	TREE	212.3	TRANSITIONAL	251.0	-38.7	N/A	N/A	-
134	WATER TANK	176.2	TRANSITIONAL	238.0	-61.8	N/A	N/A	-
135	BUILDING	159.5	TRANSITIONAL	240.0	-80.5	N/A	N/A	-
136	POWER POLE	182.2	TRANSITIONAL	231.0	-48.8	N/A	N/A	-
137	POWER POLE	182.0	TRANSITIONAL	249.0	-67.0	N/A	N/A	-
138	POWER POLE	181.5	TRANSITIONAL	307.0	-125.5	N/A	N/A	-
139	POWER POLE	183.0	TRANSITIONAL	278.0	-95.0	N/A	N/A	-
140	FLOOD LIGHT	173.5	TRANSITIONAL	272.0	-98.5	N/A	N/A	-
141	TREE	182.9	TRANSITIONAL	278.0	-95.1	N/A	N/A	-
142	TREE	200.4	TRANSITIONAL	303.0	-102.6	N/A	N/A	-
145	TREE	185.7	TRANSITIONAL	250.0	-64.3	N/A	N/A	-
197	BUILDING	183.9	TRANSITIONAL	229.0	-45.1	N/A	N/A	-
289	POWER POLE	188.8	11 APPROACH	220.0	-31.2	219.9	-31.1	-
290	POWER POLE	186.9	11 APPROACH	219.0	-32.1	218.7	-31.9	-
291	POWER POLE	190.0	11 APPROACH	233.0	-43.1	233.3	-43.3	-
292	POWER POLE	188.6	11 APPROACH	233.0	-44.4	233.1	-44.6	-
293	POWER POLE	188.6	11 APPROACH	232.0	-43.4	232.2	-43.6	-

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

INNER APPROACH PLAN & PROFILE

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH DRAWN: TE/DH/BM DATE: February 2017 SHEET 5 OF 6

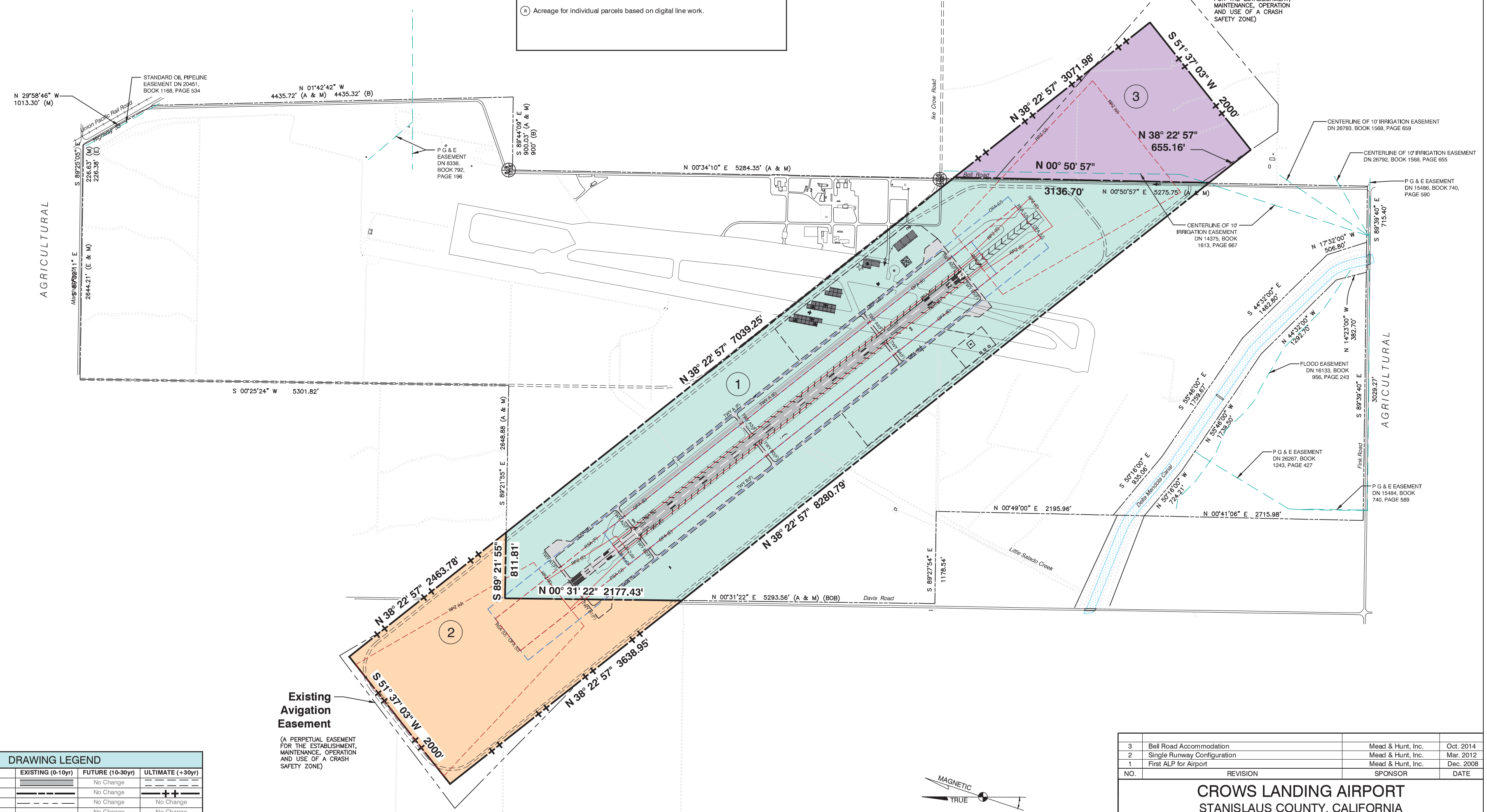
AIRPORT PARCEL DATA

PARCEL ID #	ASSESSORS PARCEL NUMBER	ACRES (a)	DATE ACQUIRED	CONVEYANCE INSTRUMENT	TYPE OF INTEREST	FUNDING SOURCE	FAA GRANT NUMBER	GRANTOR
1	N/A	372	Oct. 27, 1999	Act of Congress	FEE SIMPLE	N/A	N/A	US Govt. / NASA (Public Law 106-82)
2	N/A	120	T O		B E	A C	Q U	I R E D
3	N/A	86	T O		B E	A C	Q U	I R E D

EXHIBIT 'A' NOTES

- Airport property boundary and data source: Stanislaus County. Property boundary and individual parcels survey by Aspen Survey Company, July 2004. Survey should not be considered a precise legal description. Best available data used.
- Total existing airport property equals ±372 acres. Total future airport property equals ±578 acres.

(a) Acreage for individual parcels based on digital line work.



DRAWING LEGEND

	EXISTING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
ACTIVE AIRFIELD PAVEMENT		No Change	
AIRPORT PROPERTY		No Change	
AVIGATION EASEMENT		No Change	No Change
OTHER EASEMENTS		No Change	No Change
OTHER PROPERTY LINES (County)		No Change	No Change
RUNWAY SAFETY AREA (RSA)	RSA	No Change	RSA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	No Change	RPZ
OBJECT FREE AREA (OFA)	OFA	No Change	OFA
BUILDING			No Change
HELIPAD	N/A	H	No Change
PUBLIC ROAD			No Change
DIRT OR GRAVEL ROAD		No Change	No Change
CHANNEL / WATERWAY / CULVERT		No Change	No Change
SECTION CORNER		No Change	No Change

C:\Users\878me\appdata\local\temp\AcPublish_996\Crows ALP2017 ExhibitA.dwg Feb 27, 2017 - 3:02pm

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

EXHIBIT 'A' PROPERTY MAP

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH DRAWN: TE/DH/BM DATE: February 2017 SHEET 6 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

Stanislaus County Airport Land Use Compatibility Plan:

Addendum to Address the Proposed Crows Landing Airport

The following addendum would amend the *Stanislaus County Airport Land Use Compatibility Plan* dated October 2016 to include specific policies associated with the proposed Crows Landing Airport. After adoption of the addendum by the Stanislaus County Airport Land Use Commission, all revisions will be incorporated into the *Stanislaus County Airport Land Use Compatibility Plan* and a final document will be prepared.

Additions are shown as underlined; deletions are shown in strikeout. Only substantive changes are identified below; if necessary, minor typographical corrections also may be made prior to publication of the final document, and the date in the footer and title pages will be revised.

Chapter 1, Individual Airport Policies and Compatibility Maps

Page 1-1: Revise the first sentence to include the Crows Landing Airport:

The Stanislaus County Airport Land Use Compatibility Plan (ALUCP) contains the individual Compatibility Plan for three airports in Stanislaus County: the Modesto City-County Airport, the Oakdale Municipal Airport, and the ~~former~~ Crows Landing ~~Air Facility~~ Airport.

Page 1-4: Under “Airports in Stanislaus County, revise the fifth paragraph, first sentence:

The current ALUCP update provides policies for three airports: the Modesto City-County Airport, the Oakdale Municipal Airport, and the Crows Landing Airport ~~(forthcoming)~~ (see Map 1-1).

Page 1-6: Revise the third paragraph in the discussion of the Crows Landing Airport

The County of Stanislaus has worked closely with the California Department of Transportation’s (Caltrans) Division of Aeronautics since property conveyance, and it has developed an Airport Layout Plan (ALP) that includes the reuse of the prevailing wind runway. ~~Following appropriate review of the proposed airport layout plan and accompanying ALUCP pursuant to the California Environmental Quality Act (CEQA), t~~The County will submit an application to the Caltrans Division of Aeronautics to operate a public-use general aviation (GA) airport at the former Crows Landing Air Facility. The development of airport-specific policies is a prerequisite for obtaining an airport operating permit from Caltrans. The Stanislaus County ALUCP ~~will be amended to~~ includes airport-specific policies for the proposed Crows Landing General Aviation Airport. ~~following the certification of the associated CEQA document and approval by the County Board of Supervisors. Until that time, the airport-specific ALUCP policies associated with the Crows Landing Air Facility set forth in the County’s 2004 ALUCP shall remain in place.~~

Pages 1-6 to 1-7: Revise the discussion of Plan Adoption.

Although contained within this single volume, the Stanislaus County Airport Land Use Compatibility Plan consists of three separate ALUCPs, one for each airport addressed. Since the County’s ALUCP and General Plan update were undertaken simultaneously, an Environmental Impact Report (EIR) ~~will be~~ was prepared in accordance with the California Environmental Quality Act (CEQA) that addresses both projects. The purpose of the EIR is to identify the potential environmental impacts associated with the implementation of the revised General Plan ALUCP following adoption; the issues addressed will include those identified in the 2007 California Supreme County decision in Muzzy Ranch Company v. Solano County Airport Land Use Commission, such as an assessment of the potential displacement of future residential and non-residential land use development. The potential environmental impacts associated with the ALUC amendment to include the Crows Landing Airport were evaluated simultaneously with the EIR prepared in support of the Crows Landing Industrial Business Park, which includes the Crows Landing Airport.

Page 1-9: Revise the second paragraph describing ALUCP contents:

Chapters 2 presents airport compatibility and review policies that are applicable to each of the three airports addressed. Chapter 3 presents the compatibility policy maps associated with each airport as well as the individual policies for that airport. Chapters 4 through 6 present the airport land use background information regarding each of the airports in sequence: Modesto City-County Airport, the ~~and~~ Oakdale Municipal Airport, and the Crows Landing Airport. ~~The individual policies associated with the Crows Landing Airport, which will comprise Chapter 6, will not be presented at this time; specific policies for the Crows Landing Airport included following a separate CEQA process for the proposed Airport Layout Plan and its airport-specific ALUCP policies.~~

Chapter 2, Policies

Page 2-1: Revise Policy 1.1.2 to remove references to forthcoming material.

1.1.2 Airport Land Use Compatibility Plans for Individual Airports in Stanislaus County. With limited exceptions, California law requires an Airport Land Use Compatibility Plan for each public use and military airport in the state. This document, the *Stanislaus County Airport Land Use Compatibility Plan (ALUCP)* contains the individual ALUCP for each of the three public-use airports in Stanislaus County: There are no military airports in the County.

a.) The three airports covered by this ALUCP are:

(1) Modesto City-County Airport, a publicly owned, commercial-service airport.

(2) Oakdale Municipal Airport, a publicly owned, general aviation airport.

(3) Crows Landing Airport, a publicly owned, public-use airport pending approval by the California Department of Transportation, Division of Aeronautics. ~~This ALUCP will be amended to include site-specific data pertaining to the Crows Landing Airport upon permit receipt.~~

b.) The policies in this document are divided into three chapters.

(1) Chapters 1 and 2, together with the respective airport-specific policies in Chapters 4 through 6, comprise the ALUCP for each of the three airports.

(2) Chapter 3 includes the Individual Airport Policies and Compatibility Maps for Modesto City-County, ~~and~~ Oakdale Municipal, and Crows Landing airports ~~(Crows Landing Airport policies and maps will be added at a later date)~~. The chapter includes a set of maps for each airport plus any compatibility criteria that are unique to that airport.

(3) Chapters 4 through 6 provide specific data pertaining to each airport and summaries of the background data used to prepare the compatibility plans.

Page 2-2. Revise definition 1.1.5, Use by Affected Local Agencies.

1.1.5. Use by Affected Local Agencies:

(a) This ALUCP and its policies shall apply to all of the following affected Local Agencies (see Policy 1.2.23), each of which has or may in the future have jurisdiction over lands within parts of the Airport Influence Areas defined by this plan; specifically:

(1) County of Stanislaus

(2) City of Ceres

(3) City of Modesto

(4) City of Oakdale

(5) City of Patterson

(~~5~~6) Any future city within Stanislaus County that may be incorporated within all or part of the airport influence area associated with the Modesto City-County Airport. Oakdale Municipal Airport, or the Crows Landing Airport.

(~~6~~7) Special districts, school districts and community college districts within Stanislaus County to the extent that the district boundaries extend into an Airport Influence Area.

Page 2-4: Revise definition *1.2.7, Airspace Protection Area.*

1.2.7. Airspace Protection Area: The area beneath the Airspace Protection Surfaces for each airport as depicted on Maps **MOD-4**, ~~**and**~~ **OAK-4**, and **CRO-4**.

Page 2-6: Revise definition 1*.2.25, Noise Impact Area.*

1.2.25. Noise Impact Area: The area within which the noise impacts, measured in terms of CNEL, generated by aircraft operating at an airport may represent a land use compatibility concern. The Noise Impact Area associated with each airport is depicted on Maps **MOD-2**, ~~and~~ **OAK-2,** and **CRO-2**, Compatibility Policy Map: Noise.

Page 2-7: Revise definition *1.3.2, Referral Areas*.

1.3.2. Referral Areas: Each Airport Influence Area is divided into two areas, Referral Area 1 and Referral Area 2. Requirements for referral of Land Use Actions to the ALUC for review differ between these two areas (see Section 1.4). The airport influence area maps presented as **MOD-1**, ~~and~~ **OAK-1**, and **CRO-1** illustrate these areas.

Page 2-11: Revise definition *1.5.5, Mandatory Referral of Airport Planning and Development Actions*.

1.5.5. *Mandatory Referral of Airport Planning and Development Actions***:** Prior to approving either of the following types of airport planning and development actions, the airport operator, including the County of Stanislaus for the ~~proposed~~ Crows Landing Airport, must refer the action to the ALUC for determination of consistency with the Stanislaus County Airport Land Use Compatibility Plan**.**

Chapter 3, Individual Airport Policies and Compatibility Maps

Page 3-1: Revise the first paragraph to indicate that data for the Crows Landing airport is included:

CHAPTER OVERVIEW

This chapter presents policies and maps that are specific to each of the three airports addressed in this document: Modesto City-County Airport, Oakdale Municipal Airport, and Crows Landing Airport ~~(forthcoming)~~. The respective section for each airport, combined with the general policies that comprise Chapter 2, represents the Compatibility Plan for that particular airport.

Page 3-4: Revised the first paragraph to remove the reference to the 2004 ALUCP and to identify a new airport-specific policy for the Crows Landing Airport:

CRO. CROWS LANDING AIRPORT

CRO.1 Additional Compatibility Policies

~~*CRO 1.1 Policies for the former Crows Landing Airfield, as presented in the 2004 ALUCP, will remain in force until the County receives an airport operating permit from the Caltrans Division of Aeronautics to re-open the airfield for general aviation use.*~~

CRO 1.1 Crows Landing Industrial Business Park Specific Plan. The Crows Landing Airport is located on 370-acres within the 1,528-acre Crows Landing Industrial Business Park (CLIBP) Specific Plan Area.

Mead & Hunt

a) CLIBP Specific Plan policies incorporate the *Stanislaus County Airport Land Use Compatibility Plan* by reference.

b) In the event that ALUCP policies and *Specific Plan* policies are found to be inconsistent with one another, the more stringent policy shall apply.

Insert proposed Crows Landing Policy Maps following page 3-4 as follows:

- CRO-1, Airport Influence Area Policy Map
- CRO-2, Airport Noise Zones Policy Map
- CRO-3, Safety Zones Policy Map
- CRO-4, Airspace Protection Zones Policy Map
- CRO-5, Overflight Zones Policy Map

A copy of the revised Chapter 3 pages and maps is attached to this addendum.

Chapter 6, Background Data: Crows Landing Airport and Environs

A new chapter will be added to the ALUCP to provide background information about the Crows Landing Airport.

The new chapter is attached to this addendum. To facilitate document readability, only the Chapter title is underlined.

3

Individual Airport Policies and Compatibility Maps

Chapter Overview

This chapter presents policies and maps that are specific to each of the three airports addressed in this document: Modesto City-County Airport, Oakdale Municipal Airport, and Crows Landing Airport ~~(forth-coming)~~. The respective section for each airport, combined with the general policies that comprise Chapter 2, represents the *Compatibility Plan* for that particular airport.

To the extent that any of the policies in Chapter 2 are not intended to apply to a particular airport, those modifications are indicated here. Any additional policies that apply only to a specific airport are listed as well. These special policies are not to be generalized or considered as precedent applicable to other locations near the same airport or to the environs of other airports addressed by this *Compatibility Plan*. Where no special policies are listed, the policies in Chapter 2 prevail.

For each airport, a set of five policy maps is provided:

- *Airport Influence Area Policy Maps* indicate the overall boundary of the area, as well as the two sub-areas—Referral Areas 1 and 2—within which certain land use actions are subject to ALUC review.
- *Airport Noise Zones Policy Maps* depict the locations within which criteria addressing noise impacts are applicable.
- *Safety Zones Policy Maps* show locations where certain types of proposed development may be restricted on the basis of safety compatibility with the airport.
- *Airspace Protection Zones Policy Maps* define where limits on the heights of structures and other objects are necessary.
- *Overflight Areas Policy Maps* show where policies providing certain buyer awareness measures are applicable.

These maps provide the geographic context for the compatibility policies set forth in Chapter 2. Information and other factors considered in developing the maps for each airport are described and illustrated in the background data chapters for the respective airports (Chapters 4 through 6).

CRO. CROWS LANDING AIRPORT

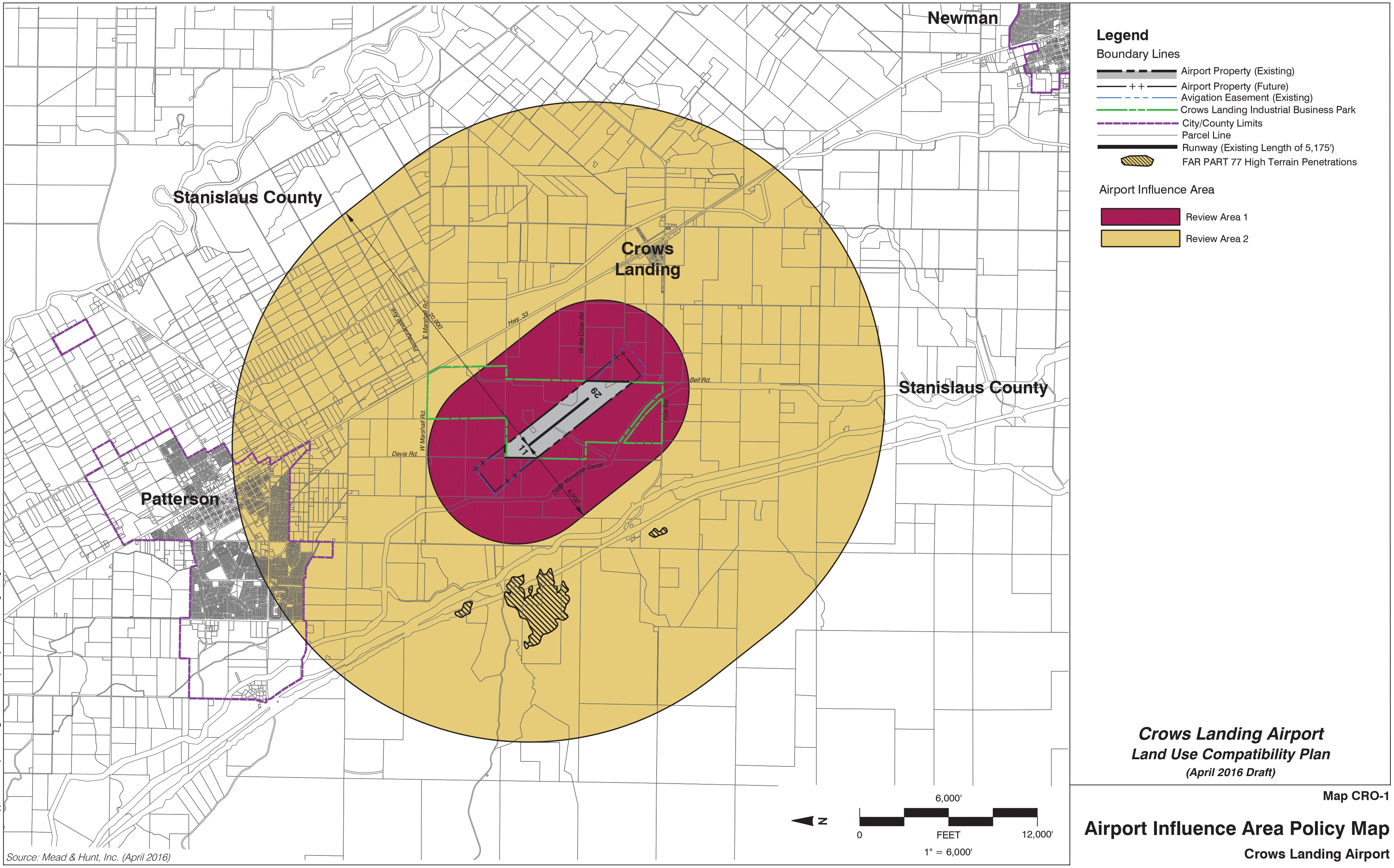
CRO.1 Additional Compatibility Policies

~~CRO 1.1 *Policies for the former Crows Landing Airfield, as presented in the 2004 ALUCP, will remain in force until the County receives an airport operating permit from the Caltrans Division of Aeronautics to re-open the airfield for general aviation use.*~~

CRO 1.1 *Crows Landing Industrial Business Park Specific Plan.* The Crows Landing Airport is located on 370-acres within the Crows Landing Industrial Business Park (CLIBP) Specific Plan Area.

a) CLIBP Specific Plan policies incorporate the *Stanislaus County Airport Land Use Compatibility Plan* by reference.

b) In the event that ALUCP policies and *Specific Plan* policies are found to be inconsistent with one another, the ALUCP shall apply.



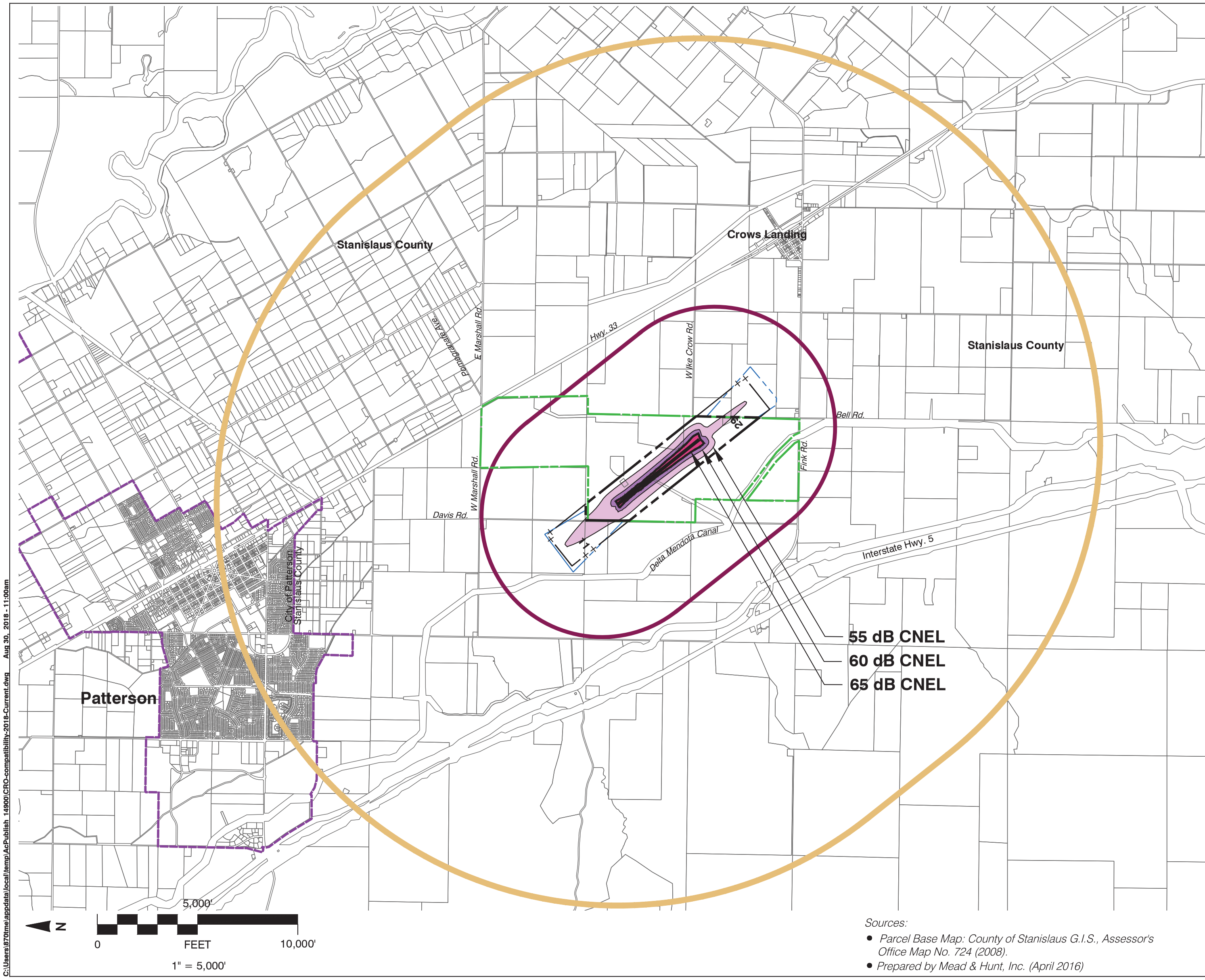
Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Map CRO-1

Airport Influence Area Policy Map

Crows Landing Airport

C:\Users\870tme\appdata\local\temp\AcPublish_14900\CRO-compatibility-2018-Current.dwg Aug 30, 2018 - 11:04am



Legend

Boundary Lines

- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Crows Landing Industrial Business Park
- City/County Limits
- Parcel Line
- Runway (Existing Length of 5,175')

Airport Influence Area

- Review Area 1
- Review Area 2

Noise Impact Zones [1]

- 55 - 60 dB CNEL
- 60 - 65 dB CNEL
- 65 - 70 dB CNEL

Notes

1. Noise contours reflect future scenario (through phase 3) with 34,000 annual operations.

Sources:

- Parcel Base Map: County of Stanislaus G.I.S., Assessor's Office Map No. 724 (2008).
- Prepared by Mead & Hunt, Inc. (April 2016)

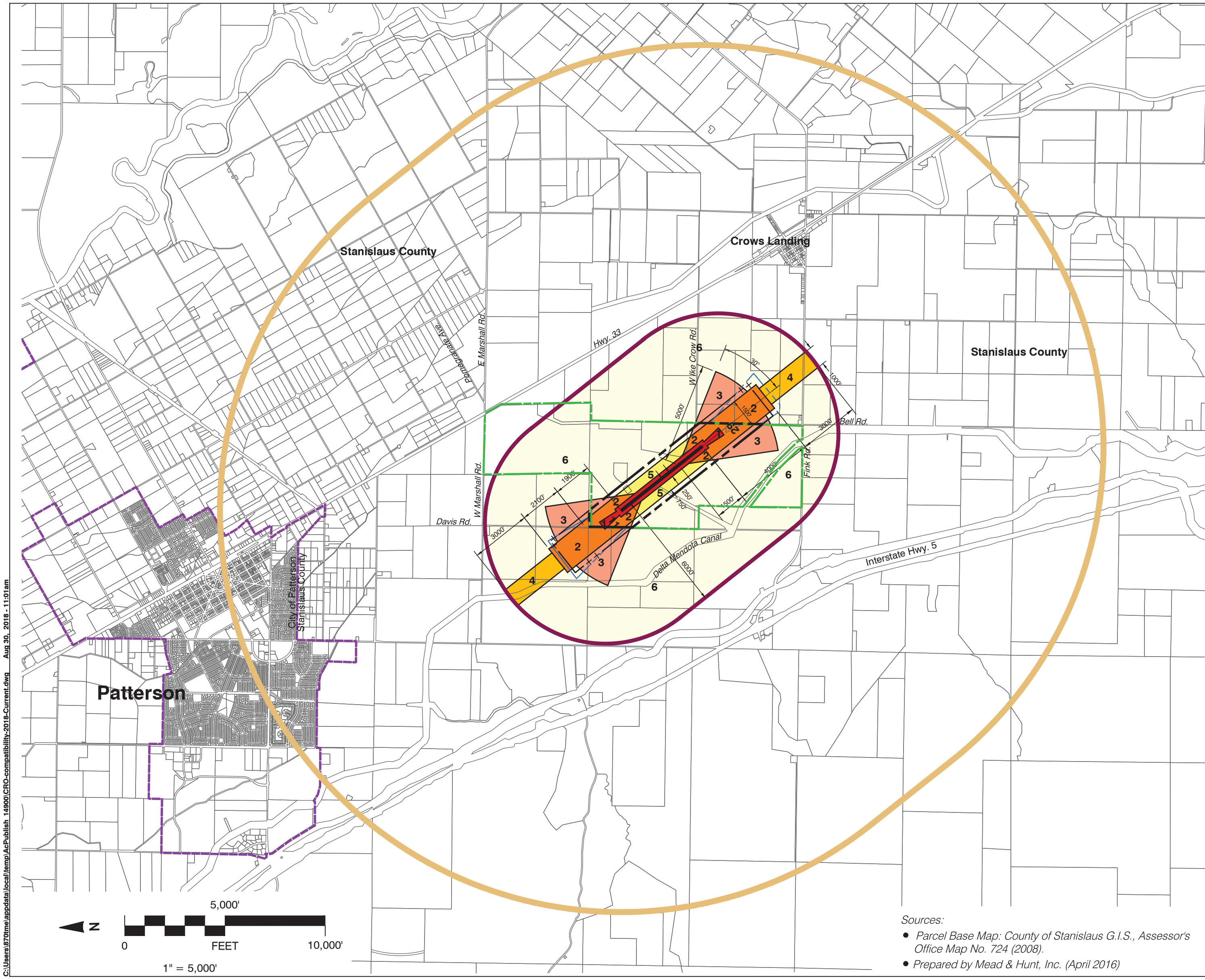
Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Map CRO-2

Airport Noise Zones Policy Map

Crows Landing Airport

C:\Users\870tme\appdata\local\temp\AcPublish_14900\CRO-compatibility-2018-Current.dwg Aug 30, 2018 - 11:00am



Legend

Boundary Lines

- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Crows Landing Industrial Business Park
- City/County Limits
- Parcel
- Runway (Existing Length of 5,175')

Airport Influence Area

- Review Area 1
- Review Area 2

Safety Zones

- Zone 1 - Runway Protection Zone
- Zone 2 - Inner Approach/Departure Zone
- Zone 3 - Inner Turning Zone
- Zone 4 - Outer Approach/Departure Zone
- Zone 5 - Sideline Zone
- Zone 6 - Traffic Pattern Zone

Notes

1. Source: Long General Aviation Safety Zones - California Airport Land Use Planning Handbook (2012).
2. Avigation easement dedication required for areas outside existing property and within Zones 1-5.
3. See Table 2 for criteria applicable within each zone.

Sources:

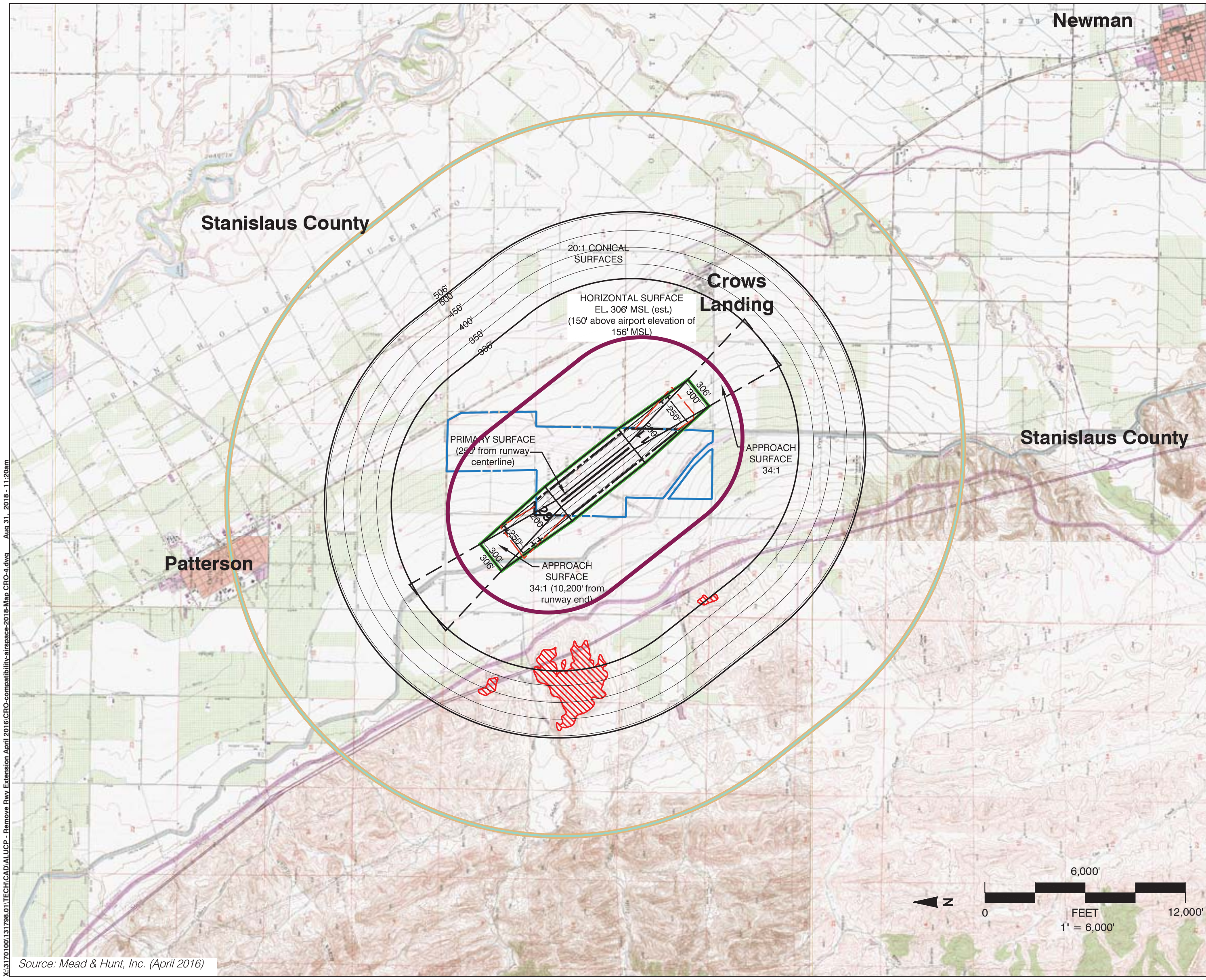
- *Parcel Base Map: County of Stanislaus G.I.S., Assessor's Office Map No. 724 (2008).*
- *Prepared by Mead & Hunt, Inc. (April 2016)*

Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Map CRO-3

Airport Safety Zones Policy Map

Crows Landing Airport



Legend

Boundary Lines

- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Crows Landing Industrial Business Park
- Runway (Existing Length of 5,175')

Airspace Protection Surfaces

- FAA Height Notification[1]
- FAR Part 77 Obstruction Surfaces[2]
- Avigation Easement Dedication[3]
- Terrain Contours
- Part 77 High Terrain Penetrations[3]

Airport Influence Area

- Review Area 1
- Review Area 2

Notes

1. Based on FAR Part 77, Subpart B, which requires that the FAA be notified of any proposed construction or alteration having a height greater than an imaginary surface extending 100 feet outward and 1 foot upward (slope of 100 to 1) for a distance of 20,000 feet from the nearest point of any runway. Beyond FAA Height Notification Area boundary, any object taller than 200 feet requires FAA notification.
2. FAR Part 77 Obstruction Surfaces: Based on FAR Part 77, Subpart C, which establishes standards for determining obstructions to air navigation.
3. Avigation easements beneath the approach and transitional surfaces up to the horizontal surface and the high terrain penetrations.
4. Heliport airspace surfaces not shown: surfaces remain on airport property or subsumed in Runway 29 airspace surfaces.
5. All elevations in feet above mean sea level (MSL).

Vertical datum in NAVD88.

Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Map CRO-4

Airspace Protection Zones Policy Map

Crows Landing Airport

X:\31701001\131798.01\TECH\CAD\ALUCP - Remove Rwy Extension April 2016\CRO-compatibility-airspace-2018-Map CRO-4.dwg Aug 31, 2018 - 11:20am

Source: Mead & Hunt, Inc. (April 2016)

C:\Users\870tme\appdata\local\temp\AcPublish_14900\CRO-compatibility-2018-Current.dwg Aug 30, 2018 - 11:02am

Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Map CRO-5

Overflight Zones Policy Map

Crows Landing Airport

6

Background Data: Crows Landing Airport and Environs

INTRODUCTION

The Crows Landing Airport is a proposed 370-acre general aviation (GA) facility that will be owned and operated by Stanislaus County. The airport will be developed using one of two runways that were developed by the U.S. Navy in 1943 as part of the Crows Landing Naval Auxiliary Air Station to Moffett Field. The 1,528-acre former Crows Landing airfield was operated for more than five decades by various branches of service. The facility was identified for closure by the Base Closure and Realignment Commission (BRAC) in the 1990s. The United States Congress directed the National Aeronautics and Space Administration (NASA) to convey the property to Stanislaus County in 2004 through Public Law 106-82.

The proposed airport is located in an unincorporated area of the County's West Side (see **Exhibit CRO-1)**. The decommissioned military facility was conveyed to the County for the purposes of economic development, and the County has designated the entire 1,528-acre property as the Crows Landing Industrial Business Park (CLIBP). The 370-acre planned airport is included in the 1,528-acre CLIBP Specific Plan Area and focuses on the reuse of a former military runway (former Runway 12-30). The proposed compatibility policies for the Crows Landing Airport and the proposed *Crows Landing Industrial Park Specific Plan* were developed concurrently to promote consistency between the envisioned airport and adjacent CLIBP land uses.

The CLIBP is located approximately 1 mile east of Interstate 5, 1 mile south of the City of Patterson, and 1.4 miles west of the Crows Landing community. Access to the airport is available from Highway 33 and Marshall Road to the north, Highway 33 and Ike Crow Road or Fink Road from the East, and from I-5 and Fink Road from the West. The airport lies at an elevation of 155.6 feet above Mean Sea Level (MSL).

STATUS OF AIRPORT PLANS

The *Airport Layout Plan and Narrative Report for the Crows Landing Airfield* is the initial planning document for the proposed Crows Landing Airport. Following property conveyance in 2004, the Board of Supervisors (Board) directed County staff to investigate the development of a new GA airport that focused on the reuse of former military Runway 12-30, the shorter of the two former runways, and to pursue the development of adjacent areas of the former airfield for the purposes of job creation. The Board of Supervisors will consider adoption of the Draft Airport Layout Plan and Narrative Report following environmental review pursuant to the California Environmental Quality Act, which is anticipated in 2017.

The proposed Airport Layout Plan (ALP) includes a long-term development plan for the airport covering three phases:

- Existing/Opening, which identifies facilities through the first 10 years of airport operation;
- Future, which identifies facilities that would be necessary from approximately 11 to 30 years after opening.
- Ultimate, which addresses facility needs more than 30 years after airport opening. The facilities and operations associated with this period are likely to change and were provided only for long-range planning purposes.

The Airport Layout Plan set includes an index page, the ALP drawing, Airport Data Sheet, Airspace Plan Inner Approach and Plan Profile, and Exhibit A, Airport Property Map. The ALP Narrative report describes existing and planned airport facilities and documents existing and forecast aircraft activity. In accordance with Section 21675(a) of the California Public Utilities Code, the proposed ALP was presented to the Caltrans Division of Aeronautics with a request that it serve as the basis of the Crows landing Airport Land Use Compatibility Plan. All proposed policies were based on proposed airport development for the Existing and Future phases of airport operation (through 30 years of operation). The summary of proposed airport features is presented as Exhibit CRO-2, and the proposed ALP is presented as **Exhibit CRO-3**.

AIRFIELD CONFIGURATION

The Crows Landing Airport will include a single concrete runway (Runway 11-29), which will be 5,175 feet long and 100 feet wide. The runway will be aligned with the prevailing wind direction in a nearly northwest/southeast alignment. The primary airport building area is located northeast of the airfield. A modular building will serve as a terminal building/pilot lounge area, and a wash rack, hangars, tie-downs, auto parking area, and fuel service are envisioned.

During the first 30 years of aircraft operations, the Crows Landing Airport will be able to accommodate an Airport Reference Code (ARC) classification of B-II, which means that the airport is designed to accommodate approach speeds from 91 to 121 knots and aircraft with wing spans from 49 to 79 feet. The most demanding class of aircraft expected to use the airport regularly, as defined by the FAA as more than 500 annual operations, is the medium-sized, twin-engine, turbo-prop aircraft, such as the Beechcraft Super King Air B200. During the first ten years of operation, the airport will support visual approaches. From years 11 to 30, visibility minimums will be as low as one statute mile.

The Runway Protection Zones (RPZs) for each runway reflect FAA criteria for an ARC B-II runway. Each RPZ has an inner width of 250 feet, an outer width of 400 feet and a length of 1,000 feet. Although portions of each RPZ extend off of airport property onto adjacent agricultural lands, the County owns an avigation easement for all of the off-site areas. All runway critical areas (runway safety and objected free areas) remain on airport property for the first 30 years of airport operation.

As described in the 2016 ALP and Narrative Report, the development plans for the airport during its first 30 years of operation include:

- Small airport operations office (e.g., modular unit) and area for wi-fi, restroom, etc.
- Aircraft parking apron (five tiedowns during first ten years)

- Ten or more privately financed hangars on County leases sited on existing concrete pavement
- Perimeter fencing along Davis and Bell Roads and apron area
- Basic aviation fuel services: 100LL via self-service from a skid-mount tank and maybe Jet-A using a refueler truck
- Wash rack facility, perhaps combined with fueling facility to allow sharing of filtration system
- Non-precision instrument approach capability (GPS based)
- Basic Fixed Base Operator (FBO) services: on-site presence, basic aircraft maintenance
- Basic helicopter takeoff and landing area using existing hard-surface area southwest of Runway 11-29
- Perimeter access road and perimeter fencing fully enclosing airport property

AIRSPACE PLAN

The proposed 2016 ALP includes an Airspace Plan which depicts the future Federal Aviation Regulations (FAR) Part 77 imaginary airspace surfaces (see **Exhibit CRO-7**). The 2016 Airspace Plan reflects the existing airfield configuration and design of the runway (i.e., ARC B-II) and visual approaches to both runway ends.

ACTIVITY FORECASTS

Activity Forecast

The FAA's Aerospace Forecast was used to define broad trends in regional and national general aviation activity. However, the FAA's forecast is of limited utility in a quantitative sense. Growth in aviation activity at the proposed Crows Landing Airport will be driven by the unique features of its location and the overall success of the CLIBP, which will includes logistics, light industrial, public facilities, and business park uses.

Opening through Year 10

As provided in the 2016 ALP Narrative report, a forecast of up to 8,000 annual operations is assumed during the first ten years of airport operations. Approximately 10 based aircraft are anticipated. The majority of aircraft are likely to be single-engine, propeller airplanes, with a few multi-engine, piston airplanes, a few turbine-powered aircraft (turboprops and/or jets), and some agricultural aircraft. Some helicopter operations are possible.

Years 11 to 30

As provided in the 2016 ALP Narrative report, a forecast of up to 34,000 annual operations is assumed during the second of airport operations. Approximately 80 based aircraft are anticipated at 30 years of operation, including tie-downs. The majority of aircraft are likely to be single-engine, propeller airplanes, with a few multi-engine, piston airplanes and turbine-powered aircraft (turboprops and/or jets). Approximately one-third of the operations would be associated with based aircraft and transient aircraft providing transportation for passengers associated with the industrial and business park, and approximately one-half would be associated with touch-and-goes by aircraft based at the airport. A summary of Airport Activity is presented as Exhibit CRO-4.

Noise Contours

Future noise contours were generated reflecting the activity forecasts of 34,000 annual operations. The future noise contours for Crows Landing Airport are shown in **Exhibit CRO-5**.

Overflight Patterns

The typical aircraft traffic patterns for the Crows Landing Airport are illustrated on **Exhibit CRO-5**. The airport has standard left-hand traffic patterns to Runway 11 and Runway 29. Runway 29 is the primary runway for landings and takeoffs. Due to prevailing winds, an estimated 80% of operations take place on Runway 29 and operate into the wind.

Safety Zones

The generic safety zones provided by the Caltrans *Handbook* were applied to the existing runway configuration.[1] The only modification to the handbook was associated with Zone 1, which was adjusted to reflect the actual size of the Runway Protection Zone as prescribed by the FAA in 150.5200-13A, "Airport Design," Change 1. The safety zones for Crows Landing Airport are shown in **Exhibit CRO-6**.

Airport Environs

Exhibit CRO-8 provides a detailed summary of the existing and planned airport environs, including airport compatibility policies adopted by the local agencies. The City of Patterson and Stanislaus County are within the airport's influence area.

BACKGROUND INFORMATION

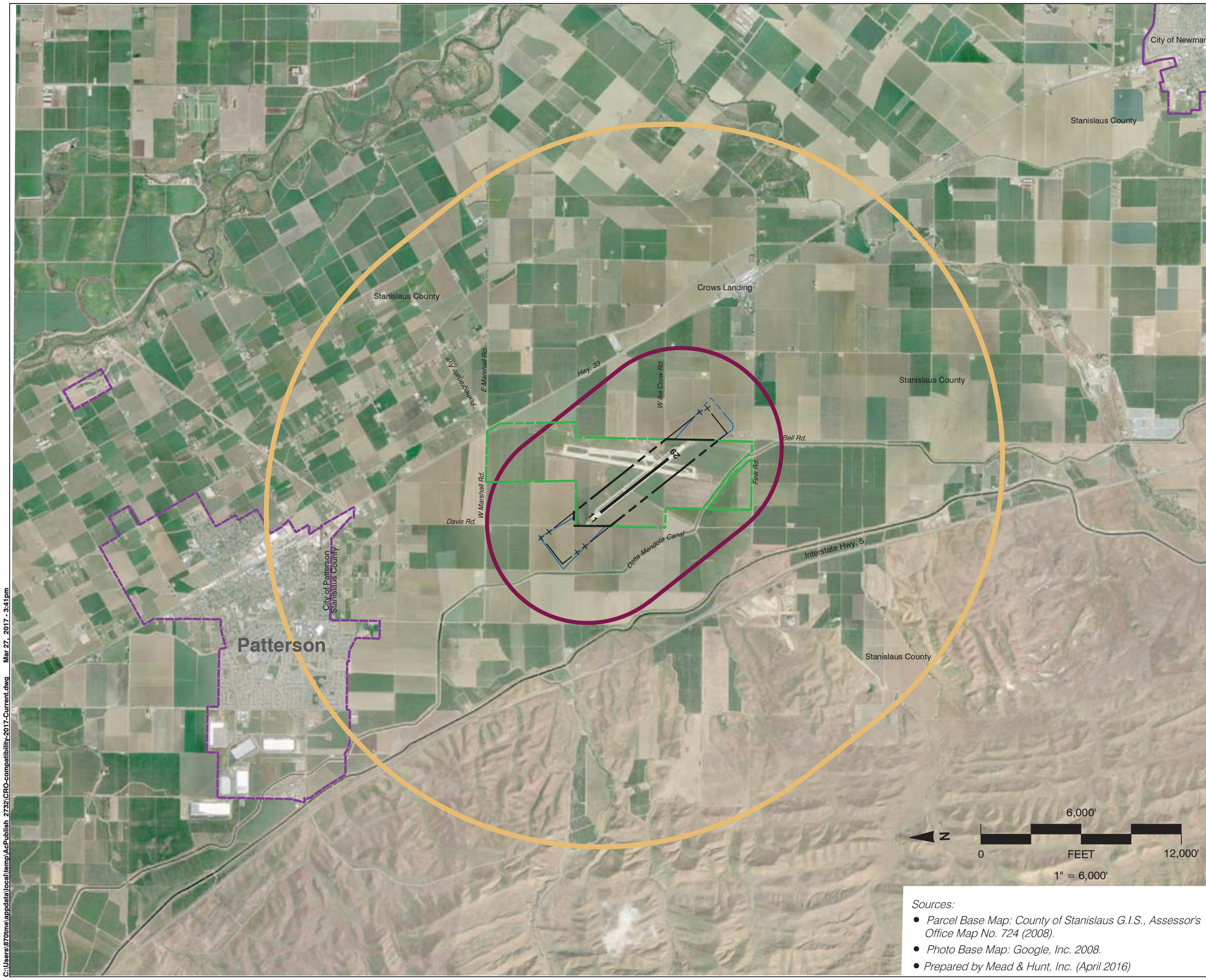
The following exhibits present the data upon which *Compatibility Plan* policy maps are based:

- **Exhibit CRO-1**—Airport Location: Presents the location of the airport in the context of existing environment (aerial photograph).
- **Exhibit CRO-2**—Airport Environs Information: Presents data pertaining to local existing and planned land uses.
- **Exhibit CRO-3**—Airport Layout Plan: Presents existing and proposed airport facilities as provided in the 2016 Airport Layout Plan and Narrative Report.
- **Exhibit CRO-4**—Airport Activity Data: Presents aviation forecasts for the 30-year planning period of this ALUCP based on forecast data provided in the 2016 ALP Narrative Report.
- **Exhibit CRO-5**—Noise and Overflight Factors: Presents the geographic area over which aircraft operating at the airport routinely fly, as well as the noise contours based on the planning period forecasts.

---

[1] Source: *California Airport Land Use Planning Handbook* (October 2011).

- **Exhibit CRO-6**—Safety Factors: Presents the locations of safety zones using the guidance and templates presented by the California Division of Aeronautics in its manual, *California Airport Land Use Planning Handbook*.
- **Exhibit CRO-7**—Part 77 Airspace: Depicts the Federal Aviation Regulations Part 77 airspace surfaces which should be kept free of obstructions.
- **Exhibit CRO-8**—Airport Environs: Presents site data, existing and planned land uses, affected jurisdictions, and compatible land use measures.



Sources:

- Parcel Base Map: County of Stanislaus G.I.S., Assessor's Office Map No. 724 (2008).
- Photo Base Map: Google, Inc. 2008.
- Prepared by Mead & Hunt, Inc. (April 2016)

Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Exhibit CRO-1

Airport Location

Crows Landing Airport

General Information
- *Airport Ownership:* County of Stanislaus
- *Year Opened:* tentative 2017
- *Property Size:* 370 acres
- *Airport Classification:* General Aviation
- *Airport Elevation:*155.6 Mean Sea Level

Airport Planning Documents
- *Airport Master Plan: None*
- *Airport Layout Plan: Drawing and Narrative Report (Draft December 2016); adoption pending*
- *Airport Land Use Plan:*
  - Stanislaus County Airport Land Use Commission Plan (adopted 2016,Crows Landing amendment pending)

Runway/Taxiway Design
At Opening

Runway 11-29
- *Airport Reference Code: B-II*
- *Critical Aircraft: King Air 200*
- *Dimensions: 5,175' long, 100' wide*
- *Pavement Strength (main landing gear configuration)*
  - 65,500 lbs. (single wheel)
  - 75,500 lbs. (dual wheel)
  - 135,500 lbs. (dual tandem wheel)
- *Average Gradient : 0.032% (rising to the northwest)*
- *Runway Lighting: none*
- *Primary Taxiways: Full-length parallel to the northeast*

Future (11 to 30 years)

Runway 11 – 29
- *Airport Reference Code: B-II*
- *Critical Aircraft: Gulfstream III*
- *Dimensions: 6,175' long, 100' wide*
- *Pavement Strength (main landing gear configuration)*
  - 65,500 lbs. (single wheel)
  - 75,500 lbs. (dual wheel)
  - 135,500 lbs. (dual tandem wheel)
- *Average Gradient :* 0.028% (rising to the northwest)
- *Runway Lighting:* MIRL, REILs
- *Primary Taxiways*: Full-length parallel to the northeast

Traffic Patterns and Approach Procedures
- *Airplane Traffic Patterns (At Opening)*
  - Runway 11: Left Traffic
  - Runway 29: Left Traffic
- *Airplane Traffic Patterns (Years 11 to 30)*
  - Runway 11: Left Traffic
  - Runway 29: Right Traffic
- *Approach Procedures (At Opening): Visual*
- *Approach Procedures (11-30): Non-precision >1 mile*
- *Approach Aids (At Opening): None*
- *Approach Aids (21-30 years): GPS based*
- *Operational Restrictions (At Opening and 11 -30): Daytime use only*

Approach Protection
- *Existing Runway Protection Zones (RPZ)*
  - Runway 11: 7% off property
  - Runway 29: 0% off property
- *Ultimate Runway Protection Zones (RPZ):*
  - Runway 11: 0% off property – Easement; Future Fee Simple Acquisition
  - Runway 29: 0% off property–Easement; Future Fee Simple Acquisition
- *Approach Obstacles: Trees penetrate "ultimate" precision approach surface to Runways 29L and 29R (objects to be removed)*

Building Area
At Opening
- *Aircraft Parking Location: Northeast side of Runway 11-29*
- *Aircraft Parking Capacity*
  - Hangar spaces: 5
  - Tie Downs: 15
- *Other Facilities and Services*:
  - Fuel: None
  - FBO: None

Future (11 to 30 years)
- *Aircraft Parking Capacity*
  - Hangar spaces: 35
  - Tie Downs: 15
- *Other Facilities and Services*:
  - Fuel: 10LL, Jet-A
  - FBO: Yes

Exhibit CRO-2

Airport Features Summary

Crows Landing Airport

BUILDING AND FACILITY LEGEND

FACILITY	ELEVATION
(1) Future Operations Office	162'
(2) Fixed Base Operator (FBO)	162'
(3) Fuel Facility	N/A
(4) Future Wash Rack	N/A
(5) Future Runway End Indicator Lights (REILS)	N/A
(6) Future Medium Intensity Approach Light System With Rail (MALSR)	N/A
(7) Future Rotating Beacon	197'

MONUMENTS (e)

	ID #	LATITUDE	LONGITUDE	ELEVATION	DESCRIPTION
1	HS5483	37° 24' 46.766" N	121° 06' 20.756" W	142.00'	Brass survey disk
2	HS5478	37° 24' 13.062" N	121° 06' 37.571" W	162.00'	Brass survey disk
3	HS5474	37° 23' 57.775" N	121° 06' 40.989" W	173.00'	Stainless steel rod
4	HS5477	37° 24' 48.034" N	121° 06' 29.765" W	144.00'	Brass survey disk

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- Magnetic Declination source: National Geophysical Data Center.

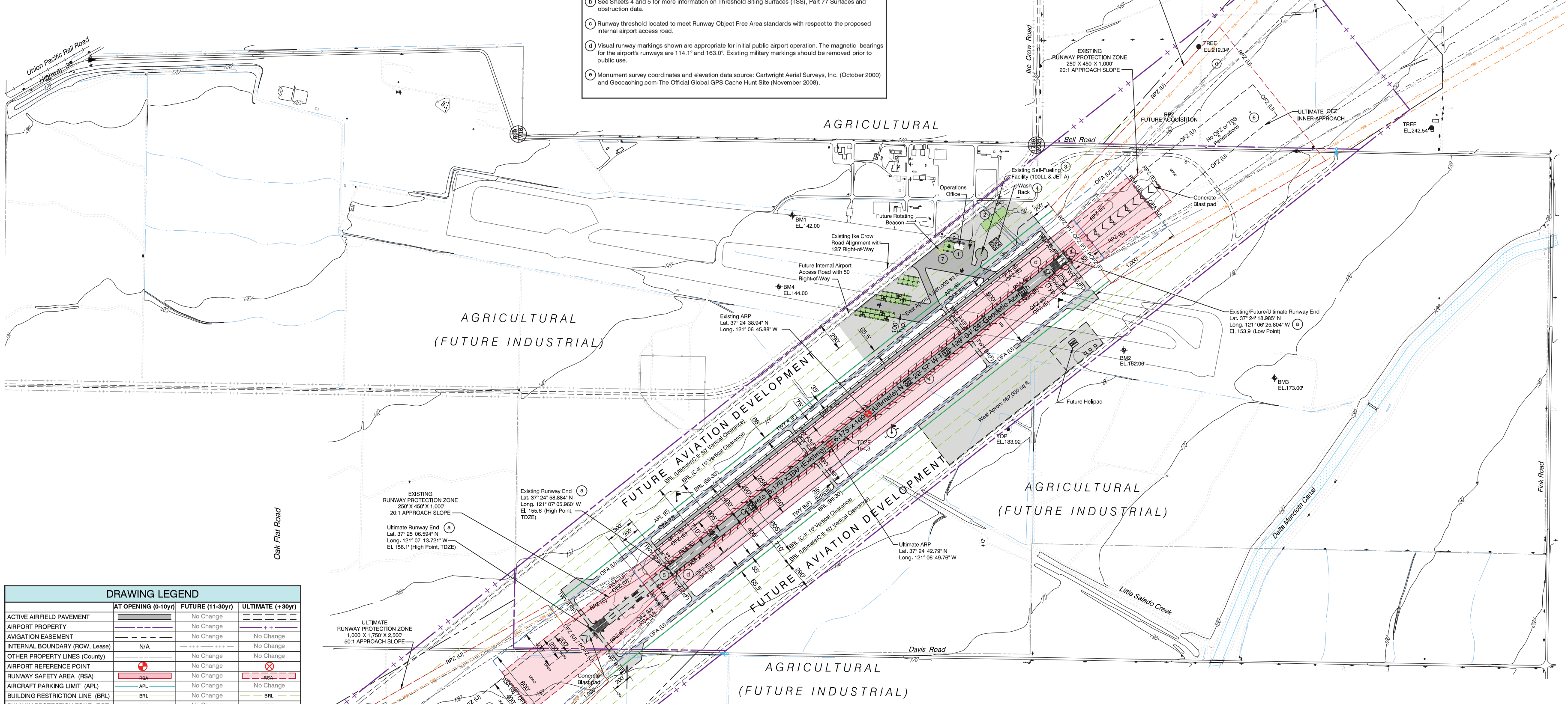
(a) Airport coordinate and elevation data source: Photogrammetric survey conducted by Cartwright Aerial Surveys, Inc. (October 2000) and field survey by Mead & Hunt, Inc. (October 2008). Coordinates are NAD83. Elevations are NAVD88. Geodetic Azimuth is reckoned clockwise from true north.

(b) See Sheets 4 and 5 for more information on Threshold Siting Surfaces (TSS), Part 77 Surfaces and obstruction data.

(c) Runway threshold located to meet Runway Object Free Area standards with respect to the proposed internal airport access road.

(d) Visual runway markings shown are appropriate for initial public airport operation. The magnetic bearings for the airport's runways are 114.1° and 163.0°. Existing military markings should be removed prior to public use.

(e) Monument survey coordinates and elevation data source: Cartwright Aerial Surveys, Inc. (October 2000) and Geocaching.com-The Official Global GPS Cache Hunt Site (November 2008).



DRAWING LEGEND

	AT OPENING (0-10yr)	FUTURE (11-30yr)	ULTIMATE (+30yr)
ACTIVE AIRFIELD PAVEMENT		No Change	
AIRPORT PROPERTY		No Change	
AVIGATION EASEMENT		No Change	No Change
INTERNAL BOUNDARY (ROW, Lease)	N/A		No Change
OTHER PROPERTY LINES (County)		No Change	No Change
AIRPORT REFERENCE POINT		No Change	
RUNWAY SAFETY AREA (RSA)	RSA	No Change	RSA
AIRCRAFT PARKING LIMIT (APL)	APL	No Change	No Change
BUILDING RESTRICTION LINE (BRL)	BRL	No Change	BRL
RUNWAY PROTECTION ZONE (RPZ)	RPZ	No Change	RPZ
OBJECT FREE AREA (OFA)	OFA	No Change	OFA
OBSTACLE FREE ZONE (OFZ)	OFZ	No Change	OFZ
PRECISION OBSTACLE FREE ZONE	N/A	No Change	POFZ
PART 77 AIRSPACE APPROACH (b)			
THRESHOLD SITING SURFACE (TSS)	TSS	TSS	TSS
BUILDING			No Change
HELIPAD	N/A	H	No Change
PUBLIC ROAD			No Change
DIRT OR GRAVEL ROAD		No Change	No Change
FENCE			No Change
VEHICLE GATE			No Change
WIND CONE		No Change	No Change
LIGHTS: SINGLE/GROUP/FLASHING	N/A		No Change
ROTATING BEACON	N/A		No Change
UTILITY POLE / POWER LINE		No Change	No Change
CHANNEL / WATERWAY / CULVERT		No Change	No Change
TOPOGRAPHIC CONTOURS	150	No Change	No Change
MONUMENT		No Change	No Change
SECTION CORNER	14 13 23 24	No Change	No Change

C:\Users\870tme\appdata\local\temp\AcPublish_596\Crows.ALP2017.LayoutPlan-CURRENT.dwg Feb 27, 2017 - 3:18pm

SUBMITTED BY:
County of Stanislaus, California

By ______________ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

AIRPORT LAYPOUT PLAN

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 2 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

Exhibit CRO-3

Based Aircraft

	At Opening [a] (to 10 years)	Future [b] (11 to 30 years)
Aircraft Type		
Single-Engine	10	50
Twin-Engine	--	10
Business Jets	--	14
Helicopters	--	6
Total	*10*	*80*

Aircraft Operations

	At Opening [a] (to 10 years)	*Future* [b] (11to 30 years)
Total		
Annual	4,000	34,000
Average Day	11	93
Distribution by Aircraft Type		
Single-Engine, Piston	100%	65%
Twin-Engine Piston	--	10%
Turboprop	--	15%
Business Jet	--	10%
Distribution by Type of Operation		
Local (incl. touch-and-goes)	75%	45%
Itinerant	25%	55%

Time of Day Distribution [a]

	At Opening (to 10 years)	*Future* (11 to 30 years)
All Aircraft		
Day (7am to 7pm)	98%	85%
Evening (7pm to 10pm)	2%	10%
Night (10pm to 7am)	--	5%

Runway Use Distribution [a]

	At Opening 2009	*Ultimate* 20+ Years
All Aircraft Types		
Runway 11	20%	20%
Runway 29	80%	80%

Flight Track Usage [a]

- Runway 29:
  - 50% straight-out departures,
  - 25 90-degree turn departures,
  - 25% 180-degree turn departures
- Runway 11 and 11: 100% straight-in arrivals

Notes

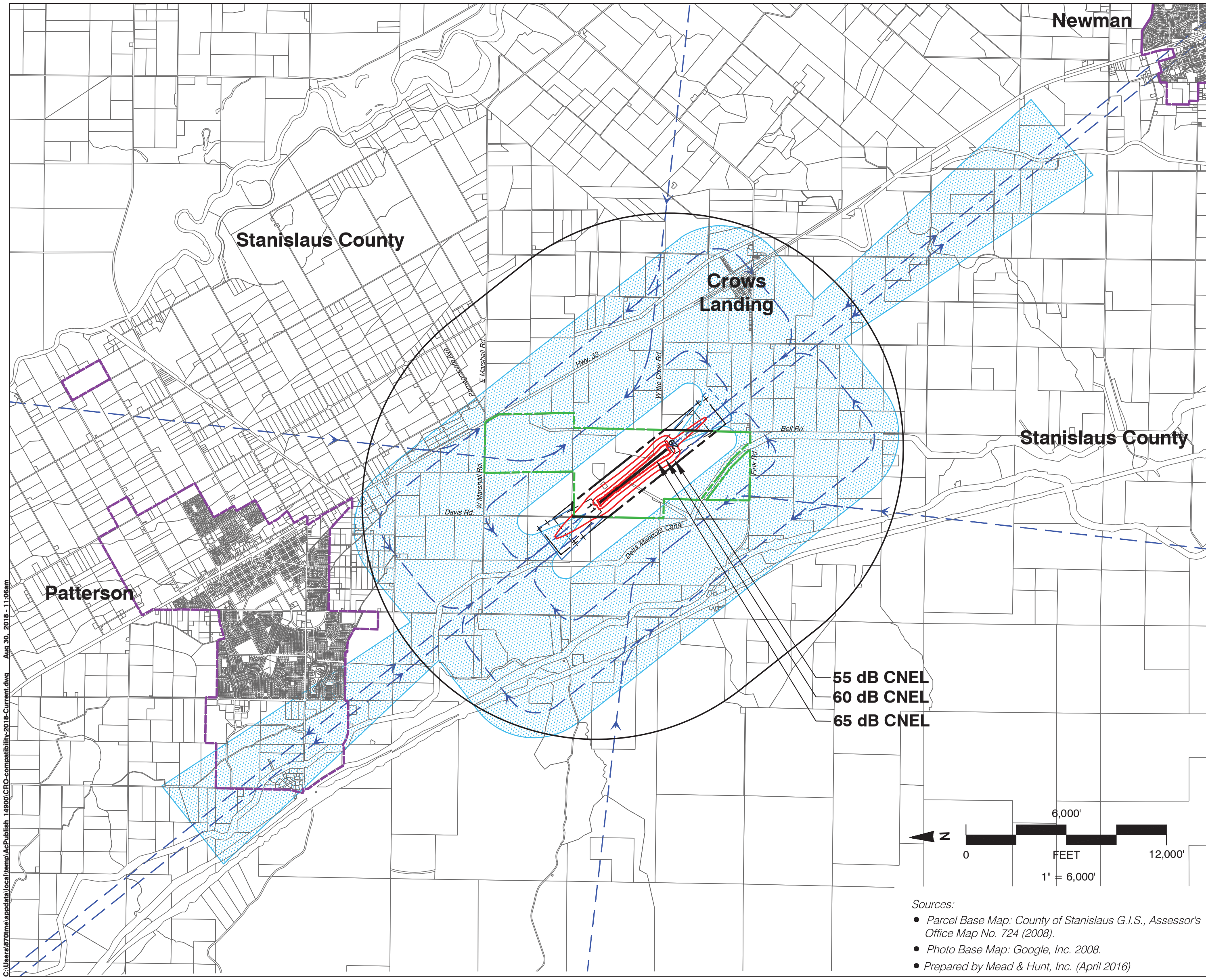
[a] Estimated by Mead & Hunt for compatibility planning purposes.

[b] Estimate represents the theoretical capacity as established in the Draft Airport Layout Plan Narrative Report. This forecast scenario assumes total build-out of the adjacent industrial park. Time frame is undefined but assumed to be beyond 2028.

Exhibit CRO-4

Airport Activity Data Summary

Crows Landing Airport



Sources:
- Parcel Base Map: County of Stanislaus G.I.S., Assessor's Office Map No. 724 (2008).
- Photo Base Map: Google, Inc. 2008.
- Prepared by Mead & Hunt, Inc. (April 2016)

Legend

Boundary Lines

- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Crows Landing Industrial Business Park
- City/County Limits
- Parcel Line
- Runway (Existing Length of 5,175')

Noise and Overflight Compatibility Factors

- Flight Tracks
- General Traffic Pattern Envelope (80% of aircraft overflights at approximately 1,500 feet or less above runway elevation estimated to occur within these limits).
- FAR Part 77 Conical Surface and Outer Approach

Calculated Noise Contours

- 55 dB CNEL
- 60 dB CNEL (34,000 Annual Operations)
- 65 dB CNEL

Notes

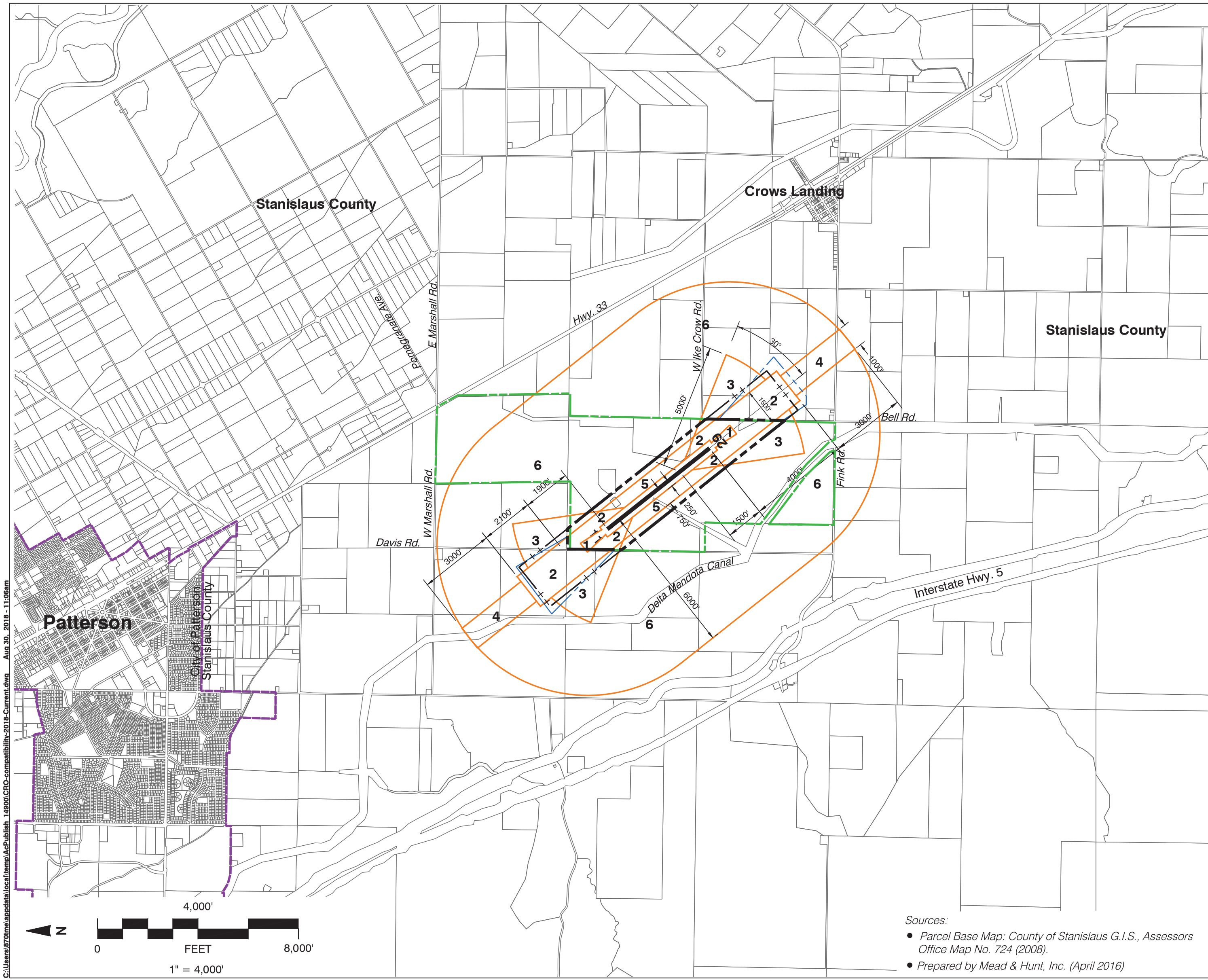
1. Aircraft on a straight-in 3.0° approach slope will descend below 1,500 feet above the airport at distance of approximately 30,000 feet from the runway end.

Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Exhibit CRO-5

Noise and Overflight Factors

Crows Landing Airport



Legend

Boundary Lines

- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Crows Landing Industrial Business Park
- City/County Limits
- Parcel Line
- Runway (Existing Length of 5,175')

Safety Compatibility Factors[1]

- Safety Zones - 4,000' - 5,999' General Aviation Runway (Zone 1 adjusted to match Runway Protection Zone on Airport Layout Plan; 250' x 450' x 1,000' for each runway end)

Notes

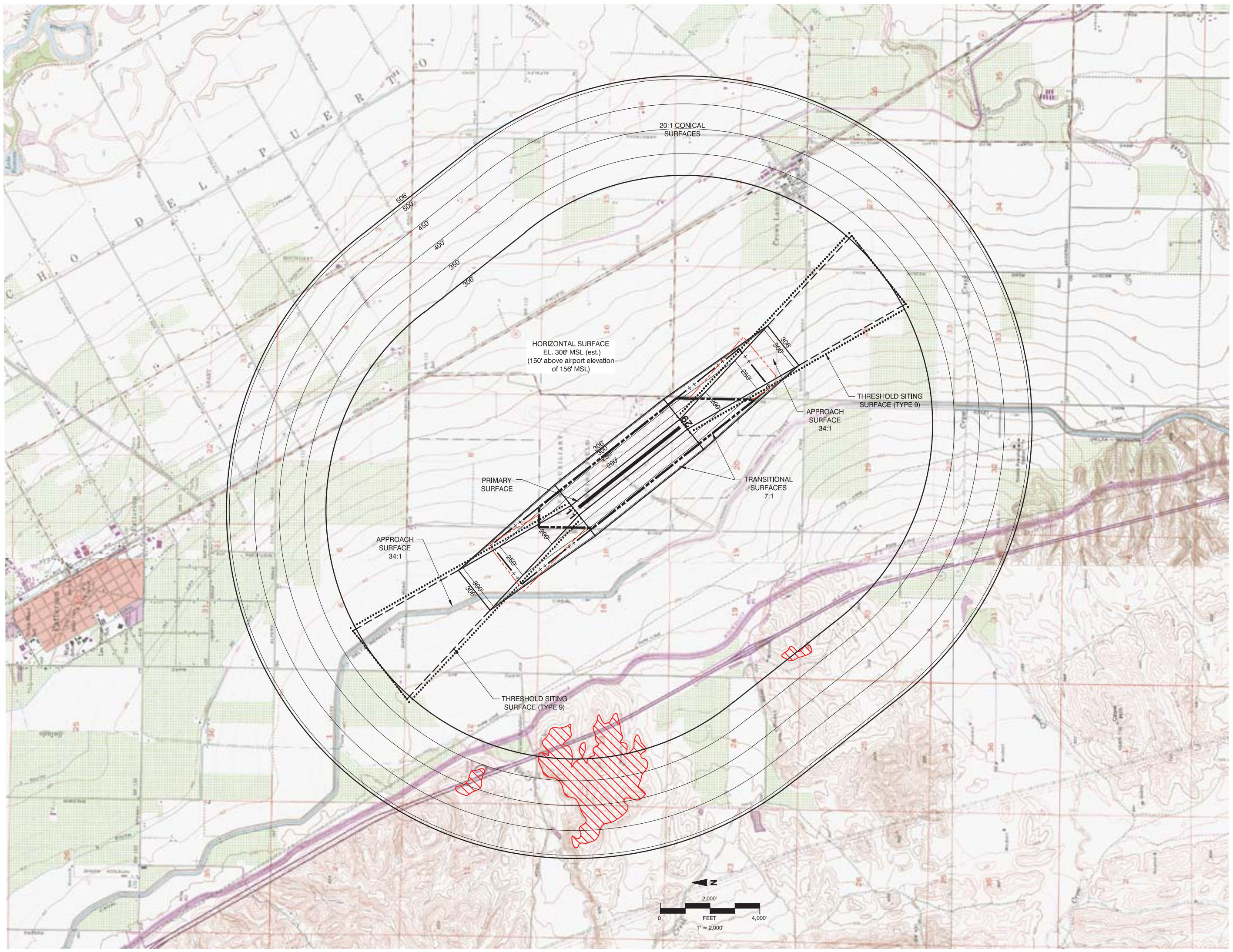
1. Safety Zone Source: California Airport Land Use Planning Handbook (October 2011).

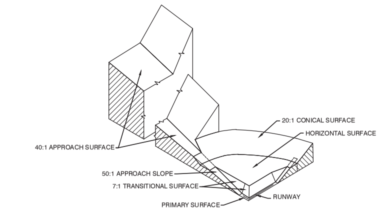
Crows Landing Airport
Land Use Compatibility Plan
(April 2016 Draft)

Exhibit CRO-6

Safety Factors

Crows Landing Airport





TYPICAL FAR PART 77 SURFACES

LEGEND

- FAR Part 77 Surfaces
- Threshold Siting Surface (TSS)
- Runway Protection Zone (RPZ)
- Airport Property (Existing)
- Airport Property (Future)
- Avigation Easement (Existing)
- Terrain Contours
- Part 77 Surface Penetration
- (e) Estimated

NOTES:

(a) All elevations in feet above mean sea level (MSL). Vertical datum in NAVD88.

SOURCES:

USGS Topographic Maps. Vertical datum is NGVD29 (add 2.480 feet for NAVD88). Photogrammetric Survey by Cartwright Aerial Surveys, Inc. (Oct. 2000) and Field Survey by Mead & Hunt, Inc. (October 2008)

AIRPORT DATA
Runway 11-29

Runway Length	5,175'
FAR Part 77 Catagory	Nonprecision
Primary Surface Width	500'
Radius of Horizontal Surface	10,000'
Approach Surface Width (outer)	3,500'
Approach Surface Length	10,000'
Approach Slope	34:1

NO.	REVISION	SPONSOR	DATE
3	Revised to Show 11-30 year Runway Configuration	Mead & Hunt, Inc.	April 2016
2	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
1	Single Runway Configuration	Mead & Hunt, Inc.	Nov. 2011

CROWS LANDING AIRPORT
CROWS LANDING, CALIFORNIA

PART 77 AIRSPACE

Mead & Hunt
133 Aviation Boulevard, Suite 100
Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

DESIGN: DH/MT DRAWN: TE DATE: April 2016 SHEET 2 OF 4

Exhibit CRO-7

AIRPORT SITE

- *Location*
  - Northwestern section of the County of Stanislaus
  - Within boundaries of Crows Landing Industrial Business Park
  - 1 mile east of Interstate 5
  - 30 miles southeast of San Francisco
- *Nearby Terrain*
  - Generally level terrain, hills to the west

EXISTING AIRPORT AREA LAND USES

- *General Character*
  - Generally undeveloped agricultural lands in the immediate vicinity
- *Runway Approaches*
  - From Southeast (Runway 29): Agriculture
  - From Northwest (Runway 11): Agriculture

AIRPORT ENVIRONS LAND USE JURISDICTIONS

- *County of Stanislaus*
  - Airport in unincorporated area of County
  - Community of Crows Landing located 1.4 miles southeast of Airport
- *City of Patterson*
  - Located 1 mile northwest of Airport

STATUS OF COMMUNITY PLANS

- *County of Stanislaus*
  - General Plan, adopted 2016
  - Crows Landing Industrial Business Park Specific Plan
  - City of Patterson
- *General Plan adopted2010; General Plan Map, 2014*

PLANNED AIRPORT AREA LAND USES

- *County of Stanislaus General Plan (Adopted)*
  - Agricultural in immediate vicinity
  - Community of Crows Landing includes: rural residential, commercial, industrial, planned development
- *City of Patterson General Plan (Adopted)*
  - Estate residential, light industrial, commercial, warehouse/distribution adjacent to I-5
- *Crows Landing Industrial Business Park Specific Plan (Draft)*
  - Light industrial, warehouse/logistics ,public facilities, Business Park, aviation-related uses, open space

AIRPORT COMPATIBILITY MEASURES

County of Stanislaus General Plan (Adopted)

- *Land Use Element*
  - Urban development shall be discouraged in areas with growth-limiting factors such as airport hazard areas unless measures to mitigate the problems are included as part of the application.
  - The County will continue to enforce the height limiting ordinance near airports.
  - Residential development shall not be approved at the maximum density if growth-limiting factors such as airport hazard areas exist and it does not comply with airport height limiting ordinance restrictions.
- *Safety Element*
  - The Airport Land Use Compatibility Plan (ALUCP) and County Airport Regulations (Chapter 17 of the County Code) shall be updated as necessary, maintained, and enforced.
  - Development within areas protected by the ALUCP shall only be approved if they meet the requirements of the Plan.
  - All amendments to a land use designation, zoning district, or zoning regulation affecting land within the ALUCP boundary shall be referred to the Airport Land Use Commission (ALUC).
  - The height and exterior materials of new structures in the Airport Zone as defined in the Stanislaus County Airport Regulation shall be reviewed to determine whether they conform to those regulations.
- *Noise Element*
  - New development of noise-sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the following levels: for transportation noise sources such as traffic on airports, 60 CNEL or less in outdoor activity areas of single-family residences, 65 CNEL or less in community outdoor space for multi-family residences, and 45 CNEL or less within noise sensitive interior spaces.
- *Agricultural Element*
  - Proposed amendments to the General Plan Diagram (map) that would allow the conversion of agricultural land to non-agricultural uses shall be approved only if they considers proximity to existing airports and airstrips.

City of Patterson General Plan (Adopted)

- The City shall work with Stanislaus County and participate in studies concerning the possible conversion of the use of Crows Landing Naval Auxiliary Air Field. Any changes in use should be analyzed for their possible effects on Patterson.
- Transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance."
- County of Stanislaus Industrial Park Specific Plan (Draft)
- Information to be provided by County

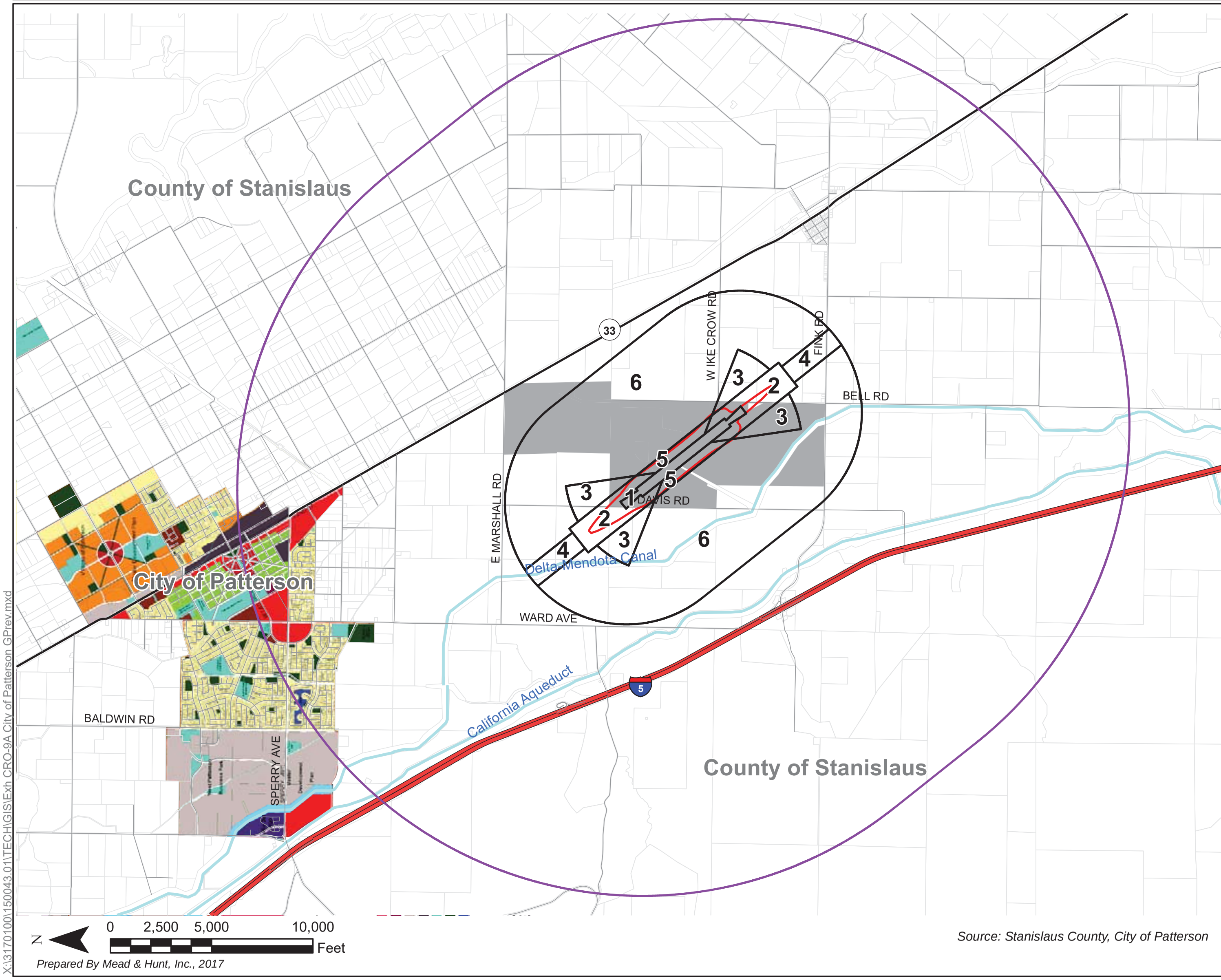
Crows Landing Industrial Park Specific Plan (Draft)

- Incorporates ALUCP by reference.

Exhibit CRO-8

Airport Environs

Crows Landing Airport



Crows Landing Airport
Land Use Compatibility Plan
(March 2017 Draft)

Exhibit CRO-9A
City of Patterson 2014 General Plan
Crows Landing Airport

X:\3170100\150043.01\TECH\GIS\Exh CRO-9A City of Patterson GPrev.mxd

X:\31701001\150043.01\TECH\GIS\Exh CRO-9B County of Stanislaus GPrev.mxd

Crows Landing Airport
Land Use Compatibility Plan
(March 2017 Draft)

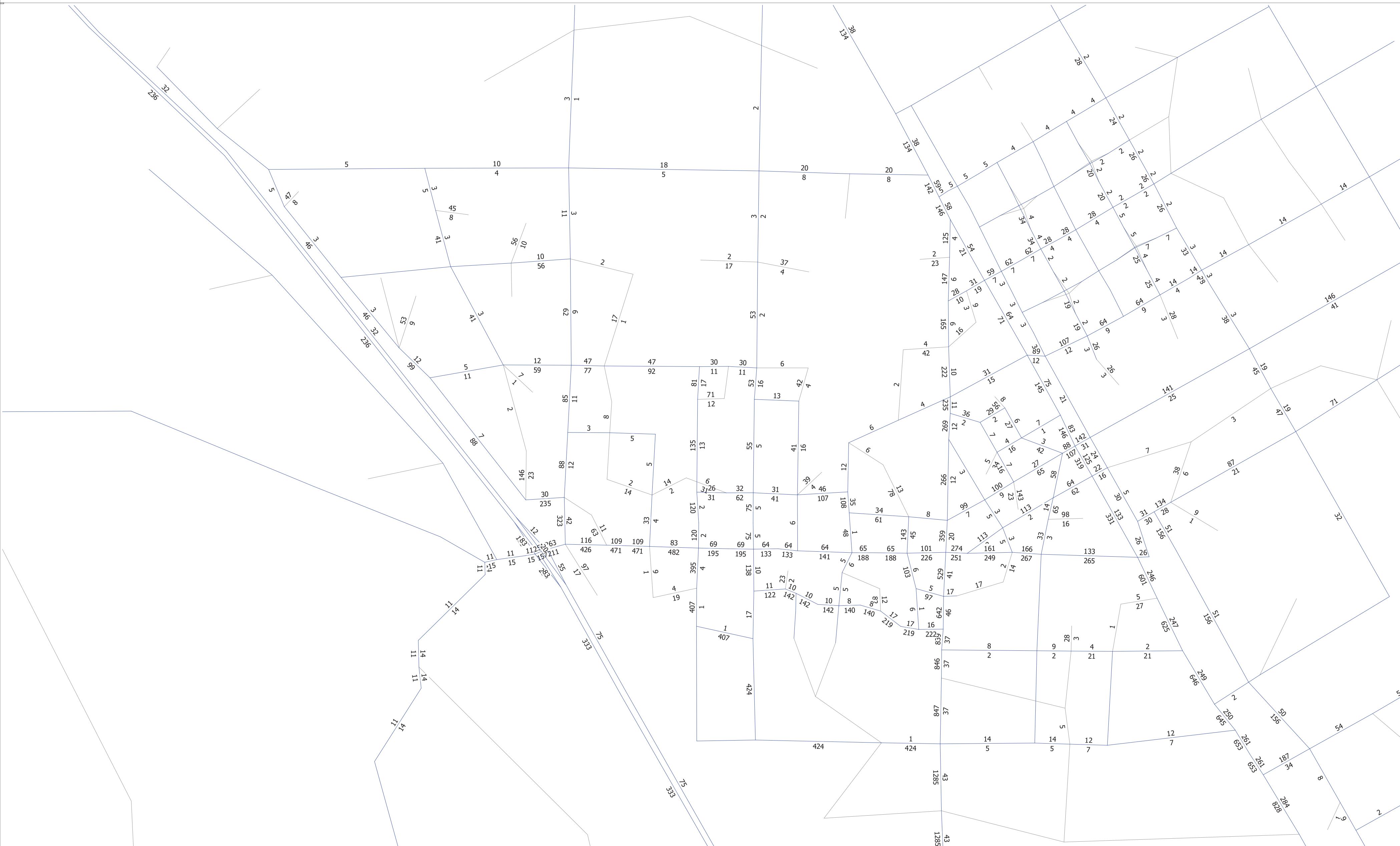
Exhibit CRO-9B

Stanislaus County
2016 General Plan
Crows Landing Airport

APPENDIX D

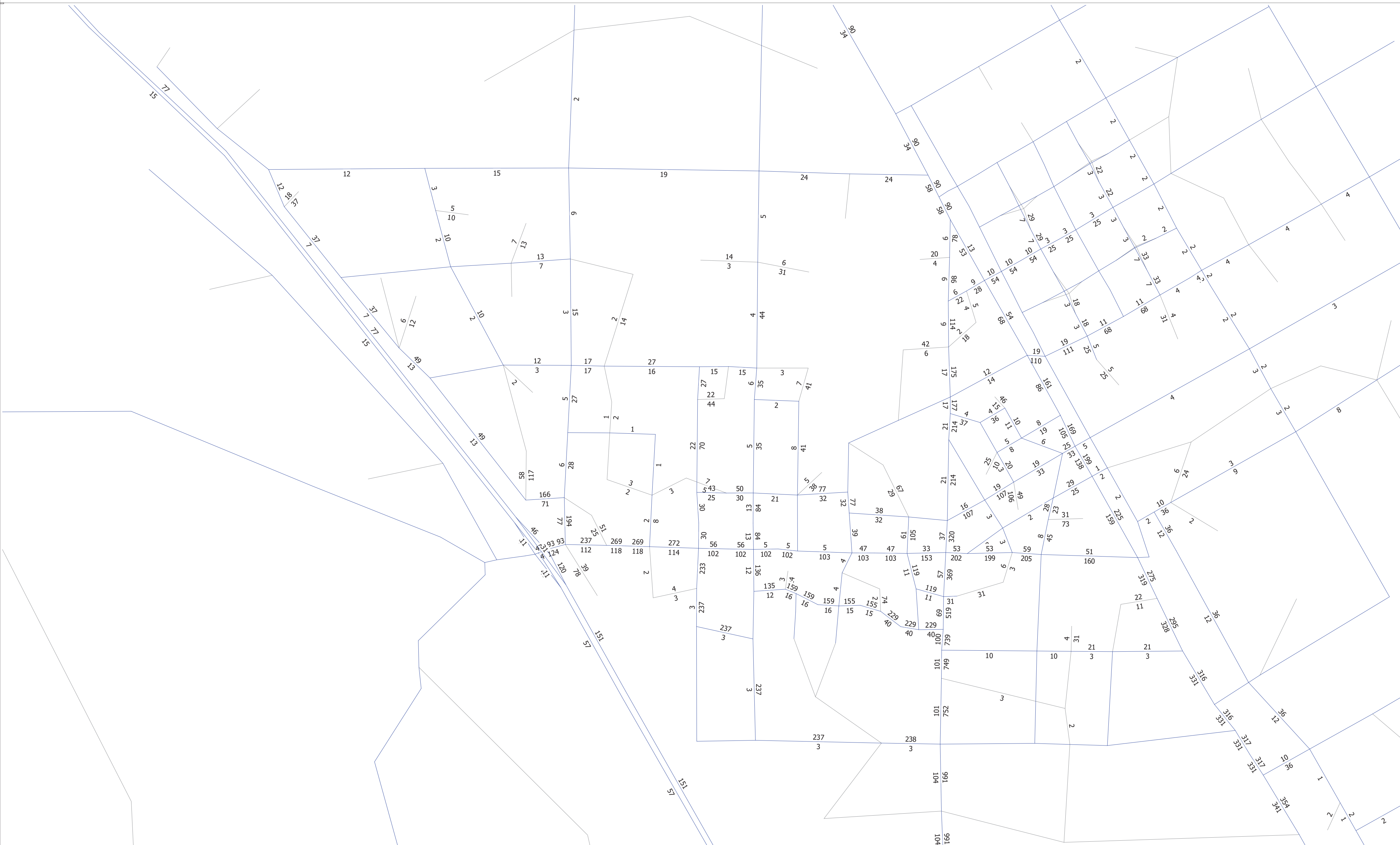
Project-Only AM and PM Traffic Volumes

Crows Landing 2035 Model
AM PH Select Zone Volume



(Licensed to TJKM Transportation Consultants)

Crows Landing 2035 Model
PM PH Select Zone Volume



(Licensed to TJKM Transportation Consultants)

APPENDIX E

Stanislaus County Economic Development Strategy

Stanislaus County

Comprehensive Economic Development Strategy

2017-2022

Community

Economy

Challenges

Economic Development Action Committee Membership 2017

Member Name	Representative
Jim DeMartini	Board of Supervisor (Rep.)
Steve Hallam	City of Ceres
Harold “Bud” Hill	City of Hughson
Douglas Ridenour	City of Modesto
Laroy McDonald	City of Newman
Cherilyn Bairos	City of Oakdale
Joshua Naranjo	City of Patterson
Sean Scully	City of Riverbank
Nick Hackler	City of Turlock
Joshua Whitfield	City of Waterford
Katrina Kidd	District #1 (Higher Education)
Jeffrey J. Rowe	District #2 (Workforce Development)
Jon Rodriguez	District #3 (Agriculture)
Cecil Russell	District #4 (Chair)
Harpreet Singh	Community Representative
Rosalinda Vierra	Community Representative
Jennifer Carter	Community Representative
Lance Boullion	Community Representative
Bob Hondeville	Community (Utility Representative)
David L. White	Community (Opportunity Stanislaus CEO)
Ronald Jackson	Community (Private Sector Executive)

This document was compiled in joint effort with the Economic Development Action Committee (EDAC) membership, Stanislaus County and the nine incorporated cities, with research assistance provided by the Stanislaus Economic Development and Workforce Alliance/Business Resource Center.
[roster update 2.06.2017]

Table of Contents

EXECUTIVE SUMMARY

The Stanislaus County Economic Development Action Committee (Stanislaus EDAC) has collaboratively developed an update to the Stanislaus Comprehensive Economic Development Strategy (CEDS). This Strategy will present the socio-economic overview of Stanislaus County, along with highlights of the economic development activities and projects that will be undertaken by public and private entities in a mission to create new jobs and provide critical services to the residents of Stanislaus County.

A central focus for pursuing economic development assistance is to begin to overcome the dramatic employment disparity between Stanislaus County and State and National figures. This employment gap has persisted for a period of many years. Based on 24-month average data from the Census Bureau's American Community Survey for 2015 and 2016, the Stanislaus unemployment rate was nearly twice that of the national level.

Stanislaus County is situated in the agricultural heart of California's Central Valley. Based on 2015 American Community Survey statistics, the County has 538,689 residents. The Stanislaus population is expected to reach 674,019 by 2035 according to the State of California estimates. This high pace of growth underscores the urgency of developing increased economic opportunity in the area.

In addition to a shortage of employment opportunities and a rapidly expanding population base, the County faces other major economic challenges. The area was particularly hard hit by the housing foreclosure crisis. The resulting fall-off in consumer spending impacted many segments of the local retail and service sectors, although a gradual recovery is now underway. For many of the residents commuting long distances to jobs in the San Francisco Bay Area, high gas prices have become a budget buster. Years of drought are greatly impacting the agricultural sector as well.

This CEDS master document develops not only a summary of infrastructure projects that require support for future growth within the County but establishes core project area themes that the workgroup intends to develop and expand upon into the future. It is critical that the community has the benefit of these projects as the local economy continues to face a number of challenges. These projects envision working in collaboration to meet the needs of a growing community through expanded employment opportunities. In order for this process to succeed, continued investment in a combination of education and workforce development efforts is required. This theme is evident in the multiple project descriptions described later in the document.

This overall vision can be enormously enhanced through the involvement of the U.S. Department of Commerce and Economic Development Administration. With this partnership, the County is more likely to achieve a self-sufficient and balanced economy. Along with neighbouring counties, we continue to fall at the bottom of rankings in the areas of education, income attainment, and funding to assist with public assistance needs. Without EDA's support and investment, economic growth will remain seriously hampered. Finally, this document has been developed with a conscious effort to complement and expand upon the eight county Central Valley Regional Comprehensive Economic Development Strategy.

BACKGROUND

In December 2001, California Housing and Community Development Department approved Stanislaus County's grant to undertake a strategic plan. The purpose of this process was to identify goals and strategies to attract new business and retain and expand existing business as a means of raising the economic vitality of the community. A focus of the Comprehensive Economic Development Strategy (CEDS) was to address the jobs-to-housing imbalance in the county and to develop strategies to reverse the widening trend of slow job creation juxtaposed with rapid population growth. The plan was designed to guide the economic development and workforce development activities in the County. Input from the public, utilization of area demographics, and review and research of economic and community development problems and opportunities within the County were used as a foundation for the CEDS tool.

During 2006, staff was directed to begin developing an updated CEDS that would address unfinished projects in the current CEDS, while becoming a tool to guide the EDAC in a new direction including the regional collaboration reflecting the changing dynamics and the factors influencing economic growth from a regional perspective.

The Stanislaus Economic Development Action Committee plans to update the CEDS to mobilize limited resources through the collaboration and commitment of all stakeholders to achieve goals and implement the plan. The collaboration will include direct and active involvement in the development and implementation of the California Central Valley Economic Development Corporation (CCVEDC) CEDS that includes all eight Central California San Joaquin Valley Counties (San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern).

In 2011, the California Central Valley Economic Development Corporation (CCVEDC) was requested by regional Federal Economic Development Administration representatives to apply for the designation of Economic Development District for purposes of receiving funding for regional economic development projects through the U.S. Economic Development Administration (EDA) and other Federal funding agencies. In March 2012, Stanislaus County joined its CCVEDC members in adopting a resolution to support the establishment of an eight-county San Joaquin Valley Economic Development District.

Over the past few years, the CEDS has become a fluid document for Stanislaus County and is updated and revised as needed with the last update occurring in 2015. The EDAC provides general oversight to the document and has developed flexible protocols to allow updates to occur frequently. Demographic and project information is refreshed as the need arises and in an effort to keep information current. All formal changes require approval from the Board of Supervisors.

SETTING

Stanislaus County, California was created on April 1, 1854 and covers a land area of approximately 1,495 square miles. It has a population of 538,689 and includes nine incorporated cities. Modesto is the county seat. Located near the center of California, Stanislaus County is 80 miles east of San Francisco, 300 miles north of Los Angeles, and 80 miles south of Sacramento. With an abundance of rich farmland, Stanislaus County is noted for its agriculture and food processing. Other major segments include manufacturing and a range of service industries, including healthcare, retail, and many others. Despite proximity to some of the wealthiest areas of California, Stanislaus County faces severe challenges in terms of rapid population growth, limited employment opportunities, and low per-capita income.

ECONOMY

Stanislaus County suffers from continuously high unemployment. Between 2010 and 2016, local job growth remained challenged with a slight 5.4% population increase. Payroll job creation has languished even as the population expanded. American Community Survey data averaged for the two years of 2015 and 2016 puts the Stanislaus unemployment rate at 8.7% of the labor force, compared to 4.65% for the nation as a whole. Current preliminary unemployment for December 2016 remains at 8.3% while California and total U.S. are at 5.0% and 4.5% respectively. Rankings produced by the State of California's Employment Development Department show Stanislaus County's unemployment rate as recently ranking 37th out of 46 regions in California.

The following table reflects average unemployment of 8.7% in Stanislaus County for the two-year period. Compared with the overall United States, Stanislaus jobless rate is nearly twice as high.

Stanislaus County			United States
Unemployment			
2015	9.1%		4.8%
2016	8.3%		4.5%
24-Month Average	**8.7%**		**4.6%**

Source: http://www.labormarketinfo.edd.ca.gov

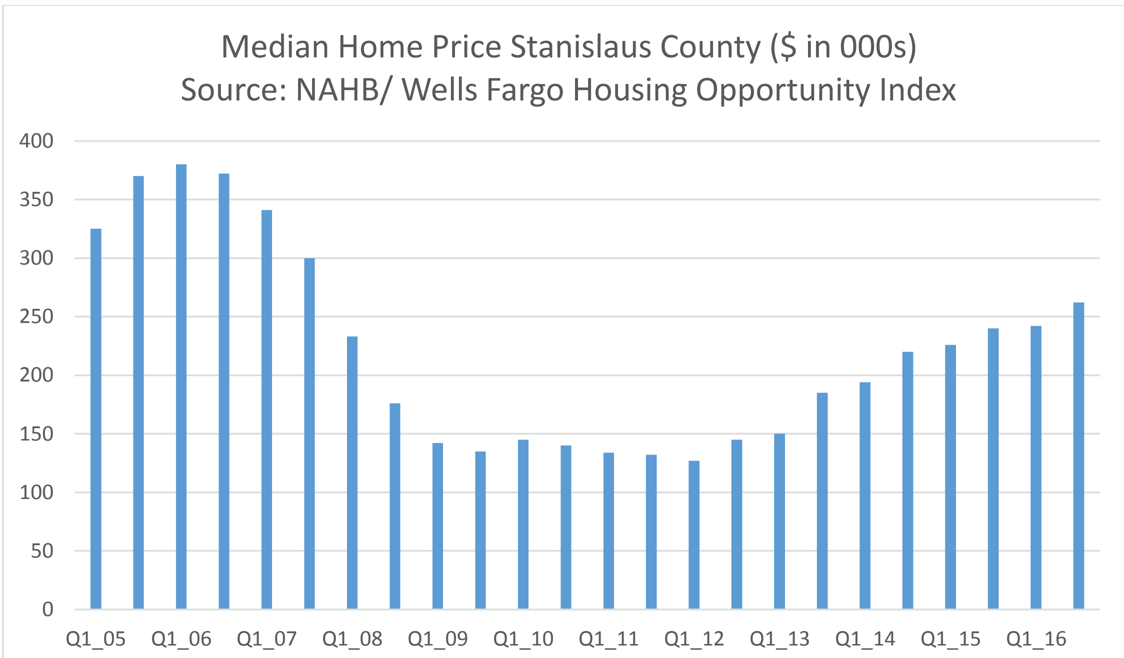
COMMUTER LIFESTYLE

A 2014 analysis of commuting patterns in the North San Joaquin Valley, which includes San Joaquin, Stanislaus, and Merced Counties, indicated that approximately 23% of Stanislaus County's employed residents commute outside of the County, and 9 percent of its residents commute to San Francisco Bay Area communities, a journey that can easily exceed 100 miles roundtrip. Frequently, workers are willing to endure the personal sacrifice and professional hardships associated with such commutes to reach a location with more plentiful, higher paying jobs. The Commuter Lifestyle is an on-going challenge for our residents as well as those in neighbouring counties (San Joaquin and Merced) as documented in North San Joaquin Valley Regional Assessment[1] conducted by the University of the Pacific in Stockton.

[1] Business Forecasting Center, September 29, 2014. *An Analysis of Commuting Patterns in the North San Joaquin Valley*. Eberhardt School of Business at the University of the Pacific. Stockton , California

HOUSING

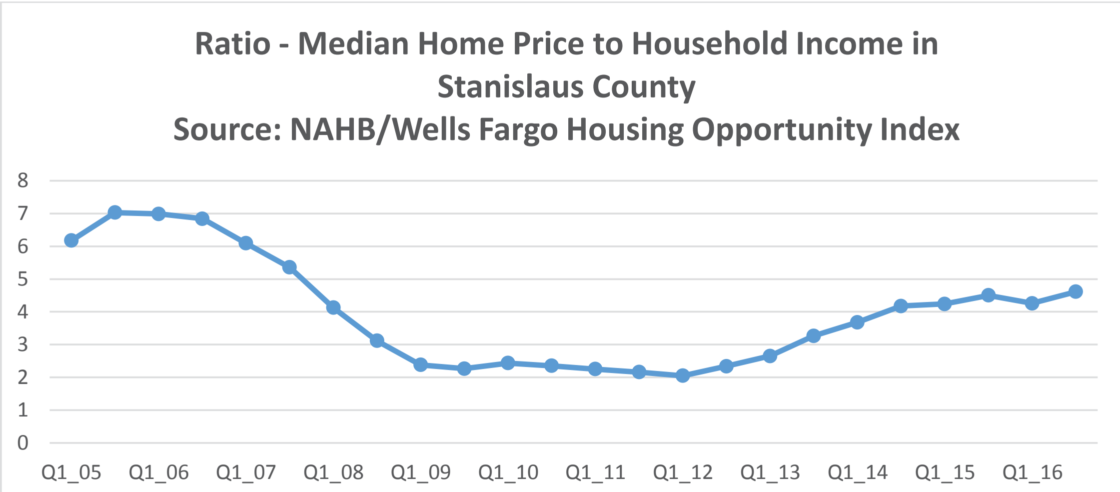
Stanislaus County stands near the epicentre of a region that was especially hard-hit by the housing crisis. From peak 2005 levels to year-end 2011, the median home sales price fell by approximately two-thirds, according to figures from the NAHB/Wells Fargo Housing Opportunity Index. By year-end 2015, prices were about two-thirds of their highs. Housing stats, an important engine of economic growth in the area, remain far below peak levels.



AFFORDABILITY

Families looking for lower-cost housing in California can find it challenging to find affordable housing, even as the foreclosure crisis eases into history. In many cases, the current local job market does not provide enough living wage jobs to allow a family to afford a mortgage. As the following chart illustrates, rising interest rates coupled with recent increases in home prices is starting to dent home affordability, although the region still fares much better on that score than it did during the middle years of the preceding decade, household income is not growing at the same pace as home prices.

A Ratio of Median Home Prices to Household Income in the 2.2 to 2.6 range has historically been viewed as an indicator of Home Affordability nationally. Prior to the housing bubble the affordability was in the low 2s. The current Affordability Ratio is 4.6, higher than the historical average. As home prices increase and wages remain flat, the ratio will continue to reflect less affordability for our Stanislaus County residents.



PER CAPITA INCOME

High unemployment, coupled with larger than average family sizes, also contribute to relatively low per capita income in Stanislaus County. American Community Survey data, averaged over a 5-year period (2011 – 2015), shows income of $20,447 per person for Stanislaus residents. This figure represents just 24.2% of the U.S. per capita income level of $28,930 over the same time period.

AVERAGE UNEMPLOYMENT & PER CAPITA INCOME

2-Year Average Data (2014 and 2015)				
United States				
Unemployment		**Per Capita Income**		
2014	7.2%	2014	$	28,889
2015	6.3%	2015	$	29,979
24-Month Average	**6.75%**	**24-Month Average**	**$**	**29,434**
Stanislaus County				
Unemployment		**Per Capita Income**		
2014	14.9%	2014	$	21,609
2015	11.3%	2015	$	23,066
24-Month Average	**13.1%**	**24-Month Average**	**$**	**22,338**

Modesto				
Unemployment		Per Capita Income		
2014	14.7%	2014	$	24,197
2015	11.9%	2015	$	23,519
24-Month Average	**13.3%**	**24-Month Average**	**$**	**23,858**

Turlock				
Unemployment		Per Capita Income		
2014	10.0%	2014	$	22,434
2015	7.3%	2015	$	27,331
24-Month Average	**8.65%**	**24-Month Average**	**$**	**24,883**

Source: U.S. Census Bureau, 2014 & 2015 American Community Survey (ACS)

5-Year Average Data (2011-2015)

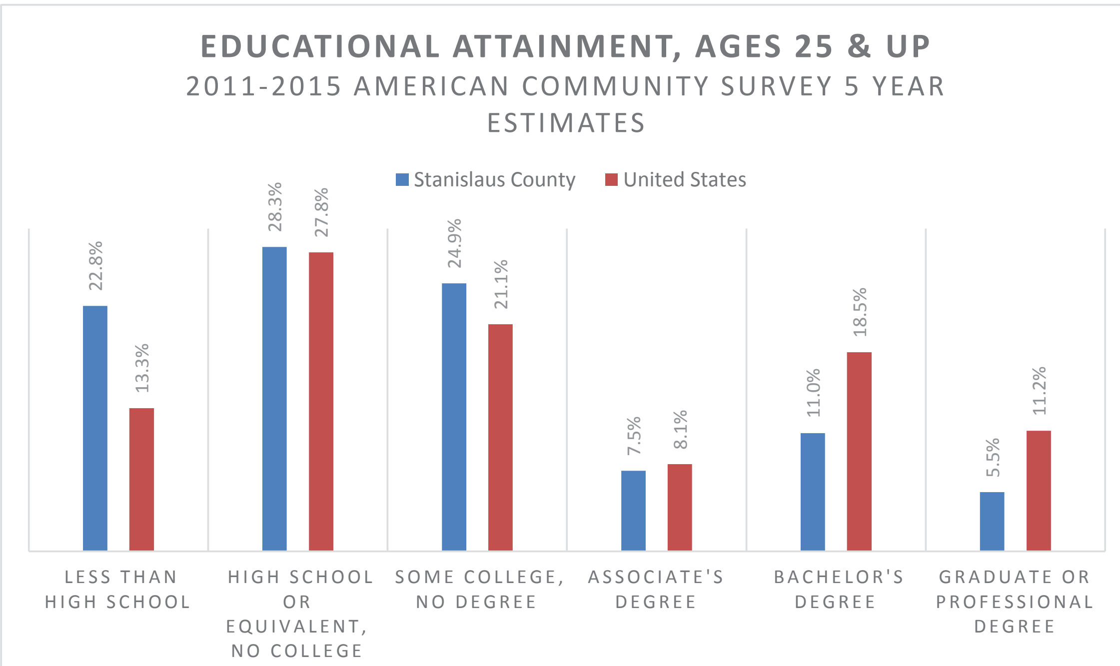
Ceres				
Unemployment		**Per Capita Income**		
60-Month Average	**16.2%**	**36-Month Average**	**$**	**18,163**
Oakdale				
Unemployment		**Per Capita Income**		
60-Month Average	**14.8%**	**36-Month Average**	**$**	**22,791**
Riverbank				
Unemployment		**Per Capita Income**		
60-Month Average	**13.2%**	**36-Month Average**	**$**	**21,697**
Hughson				
Unemployment		**Per Capita Income**		
60-Month Average	**13.1%**	**60-Month Average**	**$**	**25,465**
Newman				
Unemployment		**Per Capita Income**		
60-Month Average	**18.7%**	**60-Month Average**	**$**	**17,041**
Patterson				
Unemployment		**Per Capita Income**		
60-Month Average	**14.0%**	**60-Month Average**	**$**	**18,957**
Waterford				
Unemployment		**Per Capita Income**		
60-Month Average	**23.2%**	**60-Month Average**	**$**	**16,560**

Source: U.S. Census Bureau, 2011-2015 American Community Survey

EDUCATION AND WORKFORCE DEVELOPMENT

Workforce skill levels and high school graduation rates are a significant impediment to economic growth. At the same time, global competition and technological advances are continually increasing the need for a skilled workforce.

Stanislaus County lags well behind nationwide educational attainment averages in most categories. A dearth of four-year and advanced degrees are particularly telling as is the nearly 23% with less than a High School education.



The Employment Development Department (EDD) statistics for 2015 include information on payroll positions located in the County. Average annual jobs situated in Stanislaus County totalled 180,800. This figure includes:

- 27,600 in Government/Public Sector (including Education)
- 139,800 in Non-Government positions
- 14,500 in the Farm employment sector
- 166,300 in Private (Non-Farm) industries

There have been considerable layoffs in the private sector that have impacted the local economy. These job losses have impacted all major areas, but have hit food processing areas especially hard. The impact includes processors of fruits and vegetables, confectioners, poultry processors, and cheese manufacturers. For a detailed summary of total Stanislaus County layoffs since 2005, see Appendix A. Major layoffs compound Stanislaus' already high unemployment rate. Notably, many of the reductions have occurred because of the off-shoring of production or foreign competition.

Whereas workforce reductions have taken a major toll on production related sectors, retailers and distributors have been a major area of expansion in Stanislaus County. For a more detailed summary of total Stanislaus County business expansions see Appendix B.

INDUSTRY

Agriculture plays an important role in Stanislaus County. Stanislaus agricultural sales hit an all-time high value of $4.4 Billion in 2014, and exceeded $3.8 billion in 2015 (a decrease of 12% over the prior year). This sector and its related industry accounts for $13 Billion in our local economy or $35 Million per day. Although vitally important to our community, this base does contribute to seasonal employment levels. One in four jobs is directly tied to agriculture or related food manufacturing, placing our county at significant risk due to a lack of diversity.

STANISLAUS MAJOR MANUFACTURING EMPLOYERS COUNTYWIDE

The following chart provides an overview of Stanislaus County's major manufacturing employers countywide.

- The top manufacturing companies employ 19,228 workers.
- There are 954 agriculture businesses in the county and 434 manufacturing businesses (including food manufacturers).
- 9%, or 16,497 workers, are employed in farm related industries while 17%, or 23,824 workers, are employed in manufacturing related industries.

- The 26% of workers employed in the two industries demonstrates the need for developing a more diversified workforce and regional economy.

Company or Organization	Employees	Description
E&J Gallo Winery	3,500	Winery
Con Agra	3,145	Tomato/Bean Processor
Seneca Foods	2,138	Fruit Products
Del Monte Foods	2,010	Fruit Products
Stanislaus Food Products	1,875	Tomato Products
Foster Farms	1,484	Poultry Processor
Gallo Glass	1,000	Glass Containers
Frito Lay	684	Snack Products
Foster Farms Dairy	520	Dairy Products
Bronco Wine Company	834	Winery
G3 Enterprises	488	Wine Labeling & Bottling
Ball Corporation	300	Metal Can Manufacturing
Hughson Nut Company	300	Nut Grower & Processor
Sensient Dehydrated Flavors	300	Food Processor
Monschein Industries	220	Cabinet Manufacturing
Mid-Valley Dairy	215	Dairy Products
Mid-Valley Nut	215	Walnut Packer/Processor

STANISLAUS MAJOR NON-MANUFACTURING EMPLOYERS COUNTYWIDE

The following chart provides an overview of Stanislaus County's major non-manufacturing employers countywide.

- The top non-manufacturing companies employ 34,699 workers.
- Services and Retail Trade employ 86,600 workers.
- 70%, or 129,300 workers, are employed in non-manufacturing/farm related industries.

Company or Organization	Employees	Description
Stanislaus County	3,880	County Government
Modesto City Schools	3,500	School District
Doctors Medical Center	2,600	Health Care
Memorial Medical Center	2,300	Health Care
Ceres Unified School District	2,076	School District
Turlock Unified School District	1,778	School District
Save Mart Supermarkets	1,650	Retail Grocer
Amazon	1,605	Distribution Center
Modesto Junior College	1,582	Higher Education District
Stanislaus County Office of Education	1,371	School District
Emanuel Medical Center	1,250	Health Care
City of Modesto	1,100	City Government

California State University, Stanislaus	1,020	Higher Education Institution
WalMart	997	Retailer
MedAmerica Billing Services	900	Medical Billing/Coding
Sylvan Union School District	875	School District
Kaiser Permanente	800	Health Care
WalMart	745	Retailer
Costco	697	General Merchandise
Oak Valley Hospital District	600	Health Care
City of Turlock	580	City Government
Modesto Irrigation District	577	Water & Electric Utility
Patterson Unified School District	568	Education District
Sutter Gould Medical Foundation	564	Health Care
Oakdale Joint Unified School District	500	Education District
CVS Caremark	491	Distribution Center
TID	438	Water & Electric Utility
Crimetek Security	400	Investigation & Security

POPULATION

The California Department of Finance population estimates for Stanislaus County (projecting forward to 2035) anticipates a 20% increase in total population and increases are anticipated in both single family and multi-family households.

	2015	2035	Percent Increase
Stanislaus Population	540,794	674,019	24%

Source: California Department of Finance.

TAXABLE SALES

Retail sales data reported by the California Board of Equalization showed a declining trend through 2009, but improvement has occurred since that time with significant increase in 2014.

Stanislaus Taxable Sales ($ in 000s)								
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total Retail & Food Services	4,585,837	3,925,638	4,112,698	4,394,011	4,709,642	4,998,626	5,226,291	5,433,429
All Other Outlets	2,142,855	1,921,419	1,985,917	2,268,455	2,468,630	2,641,366	7,903,608	8,172,288
TOTAL	**6,728,692**	**5,847,057**	**6,098,614**	**6,662,466**	**7,178,273**	**7,639,992**	**13,129,899**	**13,605,717**

Source: California Board of Equalization

TRANSPORTATION

Transportation access to major markets and the Pacific Rim are key strategic advantages in Stanislaus County. Two of California's major north-south routes intersect the area: Interstate 5 and Highway 99 provide convenient and efficient means of shipment to all major markets by rail, air or truck line carriers. Deep-water ports in Oakland and Stockton are within 90 minutes. Air passenger service from San Francisco, San Jose, Oakland and Sacramento are all within 90 miles of Stanislaus County.

ENVIRONMENTAL ISSUES

Water supplies, wastewater treatment, and air quality are among the major concerns that could pose a threat to future economic prosperity. These issues will likely increase as the population of the entire San Joaquin Valley continues to expand.

For the past five years (2012-2016), California has experienced the most severe drought conditions in its recorded history. Growing concerns related to potential over drafting and exportation of groundwater inspired County leadership to adopt a groundwater ordinance to control groundwater mining and exportation. The formation of a Water Advisory Committee and the addition of a Water Resources Manager position to the Department of Environmental Resources was created to continue to address issues surrounding our limited water resources.

STANISLAUS COUNTY ROAD EXPANSION PROJECTS

One of the other main obstacles to economic growth is Stanislaus County's aging infrastructure. In 2008, the County made a concerted effort to align the regions' transportation planning document, Regional Transportation Plan (RTP), with its own Capital Improvement Program (CIP), and the regions Public Facilities Financing Plan (PFF). This alignment gave clear direction on needs and project priority.

State funding has diminished significantly with regard to roadway maintenance and capital funding. In the past two years State revenues have been reduced by more than 30% making it difficult to maintain and advance our transportation network. Yet in November 2016 the voters of Stanislaus County approved a ½ cent transportation funding measure that will generate nearly $1 billion over 25 years for our region. Our new self-help status will advance many regional capacity and safety projects and provide much needed funds to maintain our roadway system.

SUMMARY

In these opening pages, you have seen the broad brush challenges that continue to face Stanislaus County at a time of unprecedented local economic conditions. Rapid growth, decreasing land values, drought impacts, road infrastructure deficits and major gaps in education and workforce preparation skills training are just a few of the many issues our communities face.

This Comprehensive Economic Development blueprint takes a closer look at the nine incorporated jurisdictions in Stanislaus County and core priorities and development projects that have been identified as critical in order for us to shape a better quality of place in Stanislaus County.

ECONOMIC AND COMMUNITY DEVELOPMENT CHALLENGES AND OPPORTUNITIES

COUNTYWIDE SWOT ANALYSIS

The following is an analysis of the strengths, weaknesses, opportunities and threats (SWOT) related to human and economic assets as posed by external and internal forces impacting the regional economy. A later section, entitled Local Economic Development Profiles and Projects, illustrates each of the cities in terms of economic characteristics, development strategies and priorities.

STRENGTHS

- Centrally located along transportation routes to major metropolitan areas in California and Nevada
- Close to two deep-water ports
- Large, available workforce
- Climate conducive to diverse agriculture; the Valley produces 250 types of crops
- # 7 Agricultural producing county in the nation
- Multiple higher educational institutions and facilities; CSU Stanislaus recognized by Princeton Review (Nation's Best Colleges for 10th consecutive

year), Forbes (America's Top Colleges list), Money (#1 Value-Added public university) Cultural diversity
- Strong culture of Entrepreneurship/Innovation
- Access to recreation and tourism attractions
- Primary and specialized health care facilities
- Competitive land costs and Lower electric rates through MID/TID

WEAKNESSES

- Transportation infrastructure needs expansion
- Relatively high cost of business taxes relative to Nevada
- Low skills in the workforce and low levels of educational attainment
- Air quality is poor relative to competitor regions
- Water supply is variable from year to year (drought related impacts)
- Need more full-service hotels to attract business travellers and tourists
- Image of region
- Not marketing agriculture as regional strength
- Relatively high poverty levels
- High unemployment and the effects this has on families, access to education, health care and public safety
- Impacted by high rates of foreclosures and bankruptcies and continuing affects
- Large percentage of adults with "Less than High School Diploma" and low number with college and degrees
- Low self-esteem/humbleness (negative self perception)
- Growing homeless issue

OPPORTUNITIES

- Expansion of workforce training programs
- Expansion of business retention programs
- Continued attraction of large companies
- Improve water management (long term strategies)
- Tourism
- Marketing agriculture as a regional strength, including agritourism
- Marketing campaign for Stanislaus County
- Social media to help promote Stanislaus County
- Encouragement of innovation and entrepreneurship

- Positive media coverage
- Positive community messaging—pride of place
- Quicker permitting response and anticipation of industry opportunities

THREATS

- Stalling economic recovery
- Lingering drought leading to inadequate or un-reliable water supplies
- Over-regulation by government
- Negative media coverage
- Illegal drugs and gangs (i.e. increased drug and gang activity)

Local Profiles & Projects

CERES

Chris Vierra, Mayor
Toby Wells, City Manager
Steve Hallam, Economic Development Manager
209.538.5756

Introduction to City:

Ceres is an active and growing community of nearly 47,000 people that still maintains a small town feel. The City is located in the middle of Stanislaus County, adjacent to State Route 99, in one of the richest and most diverse agricultural regions of the Stanislaus River Valley. While its vibrant local economy is based in agricultural production, its central location and prime accessibility to regional transportation arteries make Ceres a city on the rise. This expanding industrial sector is attracting large and small manufacturing companies as well as large logistics operations.

The City works actively with the Ceres Chamber of Commerce to support businesses of all sizes throughout our community. Ceres is also proud to partner closely with the Ceres Unified School District, which leads the County in its innovative education and training programs for students through an award-winning career technical education pathways program. In Ceres, we understand the importance of preparing our young people to excel in new technologies in order to become employees in demand by our current and future employers.

The City of Ceres continues to undertake numerous economic development projects that positions Ceres as an attractive destination for a business to remain, grow, or locate to. Recent city initiatives include approval of a Specific Plan to revitalize its downtown, visible to more than 100,000 motorists each day; an aggressive Capital Improvement Plan that is upgrading and expanding the City's backbone infrastructure; and the adoption of an Economic Development Strategic Plan that focuses the City's efforts to support the economic health and vitality of our citizens and businesses.

Some companies that call Ceres home are: Bronco Winery, G3 Enterprises, WinCo Foods West Coast Distribution Facility, Kingspan Insulated Panels, Stanislaus Farm Supply, B&H Labeling, Stiles Custom Metal, and Diamond Bar Arena, to name a few.

Economic Development Focus:

The City has made a concerted effort toward responsible growth through a balanced mix of commercial, industrial and residential development while striving to provide adequate infrastructure and improved quality of life for its residents.

The City of Ceres created a vision for the community that will attract and retain residents and businesses. Under this vision, the City's General Plan has established economic development policies to maintain a healthy and diverse economy to meet the present and future employment, shopping and service needs of Ceres residents and visitors, and expand the economic base through marketing Ceres strengths and addressing its challenges. The City is now underway on a comprehensive update to this existing General Plan that will establish a renewed vision of the City's future through 2035.

Economic Development Initiatives and Projects:

To accomplish these policies, the City is currently investing millions of dollars to upgrade its backbone infrastructure (waste water, water, storm water, and roadways) to accommodate the expansion of existing business and attraction of new businesses.

The City recently approved the Mitchell Ranch and West Landing projects. The Mitchell Ranch project is a 26 acre commercial retail development at a key southern entryway from State Route 99, to be anchored by a SuperWalmart development center. Two adjacent corners of this same intersection are under design to accommodate another 25 acres for additional highway-oriented commercial developments. The City is also actively completing the design and preliminary environmental review for a new proposed, diverging diamond freeway interchange at Service Road and State Route 99 that will facilitate improved access to this important commercial area as well as facilitate enhanced access to the City's industrial manufacturing areas west of 99.

The West Landing Specific Plan is a master planned development that includes 1,310 new multi-family units and 2,325 single-family units, 34 acres of regional, office and light industrial uses near Crows Landing Road and Whitmore

Avenue. All environmental review is complete and this undeveloped territory is fully annexed into the City of Ceres, poised for new development.

The City maintains and regularly updates on its website, an inventory of commercial and industrial sites and buildings for sale or lease. The City is also expanding its understanding of the current retail leakage analysis in order to fine tune its economic development efforts.

Key Challenges:

A challenge Ceres faces is developing new revenue to replace the loss of State redevelopment funds, important to finance economic development activities and city-wide infrastructure upgrades. The City is working closely with regional and statewide organizations, including the Stanislaus Business and Workforce Alliance (Opportunity Stanislaus), as we examine cutting-edge tools and alternatives to promote economic development in our City.

Additionally, due to the success of past economic development efforts, Ceres is facing a current shortage of Tier 1 (available for development permits within 60 days) large and vacant industrial parcels. The Council's recent commitment to undertake a comprehensive update to the Ceres General Plan provides the opportunity to identify, plan, and annex to the City industrial-zoned lands necessary to meet the needs of new and expanding businesses over the next 20 years. Creating and maintaining an environment where our businesses, and our citizens, continue to have choices, new opportunities, and thrive, is our continuing focus.

Major Employers:

City of Ceres			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Bronco Wine	834	MFG	Winery
G3 Enterprises	488	MFG	Wine Labeling & Bottling
Kingspan Insulated Panels	101	MFG	Building Systems
Ceres Unified School District	2,076	Non MFG	School District
WinCo Foods	341	Non MFG	Distribution Center
WalMart	320	Non MFG	Retailer
City of Ceres	205	Non MFG	City Government
United Parcel Service	200	Non MFG	Distribution Hub
Sutter Health Care	182	Non MFG	Healthcare
Home Depot	135	Non MFG	Home Building Supply
Kmart	175	Non MFG	Retailer
California Department of Correction	166	Non MFG	Public Administration
Chateaux Framing Inc.	150	Non MFG	Building Exteriors
E. R. Vine & Sons	35	Non MFG	Fuel Sales

HUGHSON

Jeramy Young, Mayor
Raul L. Mendez, City Manager
209.883.4054

Introduction to City:

Hughson is a small but thriving agricultural community located in the heart of the Stanislaus River Valley. Just a few miles northeast of Turlock, east of Ceres, and southeast of Modesto nestled amidst fruit and nut orchards, Hughson preserves a small town atmosphere even as it continues to grow with a blend of high quality traditional and new homes.

Hughson was founded as a township in 1907 and named for the owner of the land, Hiram Hughson. The City of Hughson was incorporated in 1972 and has since been delivering efficient public services to residents.

Hughson's education needs are served by Hughson Unified School District whose schools have a long standing tradition and reputation for excellence. The City of Hughson partners with the Stanislaus County Sheriff's Department for the provision of law enforcement services that attribute to the lowest crime rate in the County. The Hughson Fire Protection District, the oldest established fire district in the County, has been providing critical fire protection and prevention services since 1915.

Community services are provided locally through the work of Stanislaus County (library, medical, etc.) and respected non-profit organizations such as Sierra Vista Child and Family Services, United Samaritan Foundation, and Community Hospice as well as other local entities for recreation. Samaritan Village is the City's hidden gem and the region's premier retirement community as is the Hughson Arboretum and Gardens made possible through the passion and generosity of a long-time resident.

Economic Development Focus

Agricultural Strength

The City of Hughson embraces its agricultural partners that reside around the City limits. Hughson is strategically placed at the center of one of the most productive agricultural areas of Stanislaus County and home of domestic and international leaders in nut harvesting, growing, processing and traditional and viticulture nurseries. Generations of farming families call the Hughson area their home and partner with the City of Hughson to maintain that strength and unique characteristic of the region.

<u>Industrial</u>

While the City and the surrounding area is especially noted for nut growing and processing, it is also home to many agricultural related industrial businesses. The City of Hughson actively works with to support these businesses to encourage economic growth to ensure their success. These highly competitive industrial businesses:

- Engineer and prefabricate wood roof and floor trusses and wall panels;
- Market and distribute agricultural products, animal feed and specialty chemicals and ingredients;
- Engineer efficient processing systems (metal fabrication) for the almond and walnut industries;
- Provide cold storage services;
- Provide full service chemical and fertilizer services; and
- Serve other industrial uses that complement agriculture.

The City provides adequate infrastructure to its industrial lands to attract new businesses and to ensure the capability of existing businesses to grow. This includes:

- A new wastewater treatment facility;
- A municipal water system that complies with regulatory requirements; and
- Street infrastructure that has the highest pavement condition index in the region and conveniently connects to County roadways to provide quick and easy access to the State Highways (99 and 132).

There are approximately 167 acres of industrial use in the City limits and with the last update to the City's General Plan the potential of many more which currently lie in the Sphere of Influence. These uses are located mostly in the southwest area of the City, along the Santa Fe railroad and allow the future potential of a rail spur.

The City is only a few miles south of the Beard Land Improvement Company which is served by Modesto and Empire Traction Company and offers a great advantage to rail customers by interchanging daily with both Burlington Northern Santa Fe Railway and Union Pacific Railroad.

Historically, the City has been able to offer businesses (existing and new) assistance with public improvements, capital facility fees, structural improvements, and expansion projects. The City takes great pride in maintaining a business friendly environment and offers a streamlined permitting process through efficient coordination with other local agencies.

Retail/Commercial

The City of Hughson has a uniquely vibrant downtown that consists of a variety of retail and commercial businesses. Centennial Plaza is located at the center of Hughson Avenue and is the home of the Hughson Historical Society Museum, Hughson Fruit and Nut Festival, the Hughson Farmers' Market, the Hughson Christmas Parade and other events designed to unite the community and visitors in a very positive and festive manner. The Marketplace is the City's premier shopping mall located just a short distance from the downtown. Local retail and commercial businesses in the downtown or at the shopping mall provide residents with local dining, shopping, and service options.

The City of Hughson offers an array of business assistance programs to assist existing and new businesses including incentives and loans. The Hughson Small Business Development Center and the Hughson Chamber of Commerce are wonderful resources for local entrepreneurs and the small business incubation center is a viable option for those getting started.

Economic Development Goals

The Hughson City Council's overall goal is to "maintain and enhance Hughson's economic vitality through promotion of job creation and retention, business enrichment and expansion, and development of existing retail, commercial and industrial areas."

Objective #1: Support business in commercial/industrial areas.

Strategy A: Improve the economic growth of City's commercial/industrial businesses by understanding their needs and providing programs/services that address them.

Action #A1: Meet with business owners annually, at a minimum, to discuss needs and available local programs/services.

Action #A2: Connect businesses to available resources through organizations such as the Opportunity Stanislaus, Alliance Worknet, Hughson Chamber of Commerce, etc.

Action #A3: Develop local programs/enhance services to best meet needs.

Strategy B: Promote the economic growth of City's commercial/industrial area through effective business attraction strategies, planning and infrastructure.

Action #B1: Engage Opportunity Stanislaus to conduct gap analysis to identify and pursue businesses that complement current landscape.

Action #B2: Strengthen planning and zoning to enhance City's marketability.

Action #B3: Explore and pursue construction of adequate infrastructure for business development (roads, water, sewer, storm drain, etc.).

Objective #2: Develop and enhance retail business opportunities.

Strategy A: Implement strategies to enhance resident/visitor presence in City's retail areas.

Action #A1: Promote activities in downtown that support and create opportunities.

Action #A2: Develop marketability of City through timely communication and accessibility of current market and demographic information.

Strategy B: Foster support of ventures that complement existing business climate.

Action #B1: Conduct and maintain inventory of existing businesses and develop strategies to support new ventures that complement current landscape.

Action #B2: Coordinate with existing businesses and identify or maximize opportunities for expansion.

Objective #3: Create a business friendly environment.

Strategy A: Ensure efficient business permitting process.

Action #A1: Conduct annual review of business permitting process for continuous improvement and to maximize efficiency.

Action #A2: Provide flexibility during implementation of the business permitting process to best meet needs of applicant.

Strategy B: Ensure adequate and competitive City business/development fee structure.

Action #B1: Review and evaluate business/development fee structure on an annual schedule and recommend modifications if necessary.

Action #B2: As part of the review, conduct comparable study and provide opportunity for input from stakeholders.

Objective #4: Create and develop effective business assistance programs.

Strategy A: Proactively market the City's business assistance programs.

Action #A1: Utilize variety of avenues to market local business assistance programs to increase accessibility.

Strategy B: Evaluate and develop the City's business assistance programs to ensure effectiveness.

Action #B1: Conduct annual evaluation of entire business assistance programs on an annual basis and recommend modification to increase value.

Major Employers:

City of Hughson			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Hughson Nut	300	MFG	Almond Grower/Processor
Mid-Valley Nut Company	215	MFG	Walnut Packer/Processor
Grower Direct Nut Co.	99	MFG	Walnut Processor
Alpine Pacific Nut	100	MFG	Walnut Processor
Martella's Walnut Huller	49	MFG	Walnut Processor
Builder's Choice Truss	45	MFG	Truss Producer
Valley Tool & Manufacturing	42	MFG	Farm Equipment
Dairy Farmers of America	90	MFG	Dairy Products
Duarte Nursery	350	Non MFG	Wholesale Nursery
Hughson Unified School District	267	Non MFG	Education District
Samaritan Village	122	Non MFG	Retirement Center
J.O.V. Direct Growers, Inc.	72	Non MFG	Agriculture
Whitehurst-Lakewood Memorial	51	Non MFG	Funeral/Cemetery Services
Braden Farms	25	Non MFG	Almond Grower
City of Hughson	16	Non MFG	City Government

MODESTO

Ted Brandvold, Mayor
Jim Holgersson, City Manager
Cynthia Birdsill Community &
Economic Development Department
209.577.5268

Introduction to City:

Modesto is geographically centered in Northern California. Located on Highway 99 in California's San Joaquin Valley, Modesto is the county seat for Stanislaus County with a population of over 210,000. The Tri-County Region's population of 1.5 million with a combined workforce of 518,000 forms the megaregion of the North Central Valley. Modesto's agricultural prosperity comes from abundant food production including dairy, eggs, poultry, fresh produce and nuts. Modesto is home to many local and brand-name manufacturers like Frito-Lay, Del Monte Stanislaus Foods, Pacific Southwest Container, Bell Carter Packaging, Racor and E&J Gallo Winery - the world's largest wine producer. Our health care sector is vibrant with the presence of Kaiser Permanente, Doctors Medical Center, Memorial Medical Center, Doctors Medical Center, Stanislaus Surgical Hospital and Valley Children's Hospital. The critically acclaimed Gallo Center for the Arts is a world-class facility that hosts regional, national and international artists, performers and events. Modesto maintains its small town charm with numerous music and family festivals and a certified farmers' market. Native George Lucas' homage to his teen years in Modesto is the subject of his 1973 film, "American Graffiti". Modesto has revived the Graffiti spirit with a Graffiti Summer Festival and classic car shows each June, and with the designation of a downtown Historic Graffiti Cruise Route walking tour. Modesto offers a great quality of life and is an ideal, affordable business location with economic incentives to assist business development. To learn more, visit www.choosemodesto.com or www.modchamber.org.

Economic Development Focus:

Business Attraction and Recruitment

- Identify and target "good-fit" companies to expand or relocate in Modesto. A good fit company is one that would have a compelling reason to be in Modesto because of the strength of our economic clusters, our lower cost of doing business or the unique characteristics of our workforce.

- Research, target and develop messaging to visit these companies, inviting company decision makers to visit us.
- Grow, support and communicate our key industry clusters to further diversity Modesto's economy. Key clusters include Healthcare, Ag-Tech, Food Processing, Packaging, Professional Services & Tech and Advanced Manufacturing.
- Meet with key site selection consultants who focus their activities on advising companies in our key industry clusters.
- Leverage trade shows that fit our key industry clusters.
- Attract firms that offer high value jobs to create living wage opportunities.
- Identify fully entitled sites in the city that have the greatest opportunity for infill and in attracting industry, retail and commercial investment.
- Develop and implement a retail recruitment strategy to contribute to the City's economic health. Focus on downtown 10th Street Corridor and on areas that have the greatest opportunity to generate more tax revenue for the city. Target retailers that are expanding in the Northern California region and that complement and enhance Modesto's image and help create a better sense of place.
- Participate in International Council of Shopping Centers Deal Making Shows held in Monterey and San Diego.
- Identify and meet with developers that are actively investing in Northern California opportunities.

Business Retention and Support

- Develop a systematic approach that identifies and balances local industry visits to match with our major industry clusters.
- Identify high value/high growth companies.
- Utilize city interdepartmental data to reach out to companies.
- Coordinate technical, workforce training and other assistance to local businesses in support of business expansion plans and the community's economic development growth.
- Foster a pro-business environment to support local businesses and the retention of jobs.

- Support Opportunity Stanislaus's efforts to create a Careers Manufacturing Technology Program.

Diversification of the Economic Base

- Strive to stabilize our economic base to minimize large fluctuations in employment due the nature of our agricultural focused industries.
- Focus on attracting industry clusters for business development whose needs can be met and maintained by current and future infrastructure plans.
- Evaluate and implement best practices in financing and technical assistance programs to attract and retain businesses in specified industry clusters.

Economic Development Initiatives and Projects:

I. Promote Modesto and encourage business attraction and retention through coordinated partnership efforts.

II. Determine and plan for the appropriate mixture and placement of regional commercial development.

III. Promote and facilitate growth in Modesto's home grown industries including Health Care, Ag-Tech, Food Processing, Packaging, Professional Services & Tech and Advanced Manufacturing, Retail Services, and Tourism. Develop relationships with local vendors and suppliers that provide ancillary services to these industries.

IV. Pursue a strategy to maximize long-term dependable and sustainable revenues.

V. Preserve and revitalize downtown by encouraging infill development and higher densities.

VI. Facilitate the creation and expansion of business parks to achieve more equitable jobs-housing balance.

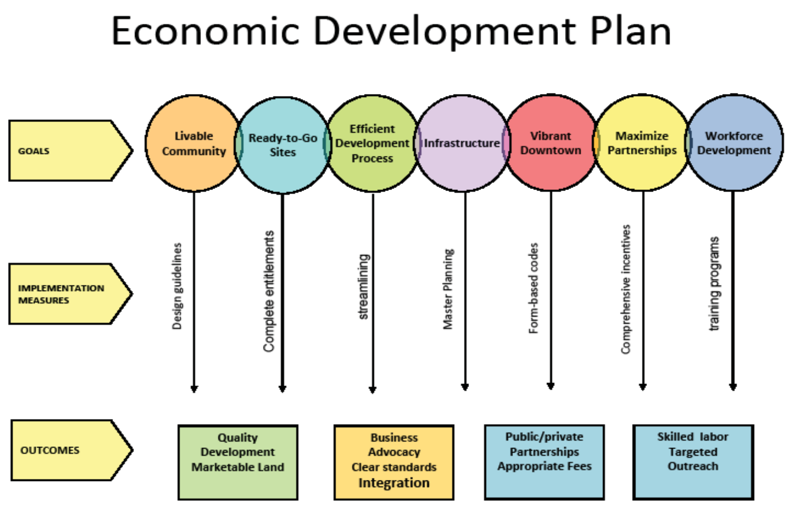
VII. Attract new firms with ties to existing industry and target new companies keyed to diversification.

VIII. Encourage public/private partnerships to foster Downtown mixed used development.

Key Challenges:

- Limited land available for development of Tier 1 sites (sites that can meet a 60 days or less development timeframe) and Tier 2 sites (sites that can be ready for business development within a year) in Modesto proper for business park and industrial land uses.
- Lack of infrastructure financing resources for the development of existing sites for Business Park and industrial land uses.
- Lack of State redevelopment support and business environment.
- Inadequate regional transportation infrastructure.
- California's reputation as an unfriendly business state due to its tax structure and over regulation of labor and employment laws.

Economic Development Focus and Priorities:



Business Attraction

- Develop an attraction strategy that addresses both the City's economic development goals and the needs of targeted companies.
- Promote Modesto to the development community to create and preserve jobs, and strengthen our revenue base.
- Update and renovate the economic development website to include local information and resources relevant to site selectors, and new and expanding businesses.
- Identify new and infill opportunity sites throughout Modesto and partner with those property owners to promote development and encourage targeted business and job growth.

- Effectively market the City's Economic Development Incentive Program and other local and State incentive programs to generate interest from targeted companies to relocate to Modesto.
- Foster a pro-business environment to attract new businesses and retain existing companies.
- Work closely with community partners such as Go-Biz, Opportunity Stanislaus, Chamber, and other organizations to provide requested information and assistance to companies interested in locating in Modesto.

Business Retention

Focus on the needs of existing companies and employers by working with other government staff and organizations that are addressing:

- Public infrastructure improvements;
- Regional transportation issues;
- Regional commercial development planning; and
- Business-friendly regulatory environments.

Project Description(s):

Liveable Community

- General Plan Amendment under way will modernize the General Plan goal and policy framework, and will result in a revised land use designation program intended to facilitate enhanced economic development; the Amendment will identify priority locations for infrastructure, and establish stronger links to funding policies, programs and sources.
- Union Pacific Railroad Quiet Zone Study is complete and we are seeking funding opportunities.
- Extension of Altamont Commuter Express is intended to increase productivity and decrease stress and expense of long-distance commuting. A downtown rail station would stimulate investment in downtown and citywide, while improving the attractiveness of Modesto for both employees and employers.

Business and Industrial Parks Development

- Expansion of Business Park and Commercial Uses on General Plan Land Use Diagram.

- Partner with existing property owners and potential developers for the redevelopment and reuse of existing non-productive industrial sites.
- The City, in partnership with Stanislaus County, is developing a one-stop location for individuals experiencing homelessness for assessment and connection with services such as permanent housing, mental health services, potential employment and shelters.
- The Kiernan Avenue Business Park represents an important economic resource to the City. The Specific Plan Area consists of approximately 614 acres located to the City's Norther border, East of Highway 99 and South of Kiernan Avenue. It is proximate to Kaiser Permanente's Main Campus and is where Valley Children's Hospital is expanding. The park provides significant growth potential for the City.
- In 2013, EAH, Inc., a non-profit housing developer, completed Archway Commons – Phase 1 that provided 76 affordable housing units, a community center and other project amenities. In September 2015, the City awarded $1,143,694 in Home Investment Partnerships Program (HOME) fund to EAH, Inc. EAH, Inc. is now ready to initiate Phase 2 that will provide an additional 74 affordable housing units. Staff anticipates bringing a Phase 2 Disposition and Development Agreement to the Council in January 2017. The EAH Inc., is looking to apply for tax credits in early 2017. Environmental Review for the project is complete.
- The Tivoli Specific Plan encompasses 454 gross acres in northeast Modesto. At build-out, the project is expected to develop between 1,900 and 3,200 housing units and 1,025,000 square feet of non-residential land uses. Approximately 80.5 acres are designated for neighbourhood-serving, regional-serving, and general commercial uses. Up to 1.6 acres are designated for professional office space. Staff from City Utilities and Community & Economic Development Departments have been meeting with interested parties to assure backbone utilities and development requirements are coordinated to assist with the timely development of properties within the Tivoli Specific Plan Area.

Development Review Process

- Implemented One-Stop Shop Development Center to streamline development review and entitlement process.
- Implemented permit process improvements such as Online Permitting.
- Regular project tracking, monitoring, facilitation, and concept review through the Development Review Team (DRt) and Red Teams

- Comprehensive Fee Restructuring through the implementation of policy, process, and procedural changes recommended by the Comprehensive Fees Task Force and adopted by City Council. In June 2016, the City Council approved reconvening the Comprehensive Fees Task Force. The task force has been formed and meetings are underway to review and align all development-related fees with the goals and policies of the City's General and Strategic Plans and to provide policy direction for an update to the City's Capital Facilities Fees program.
- Pre-submittal meetings with city development review staff members to ensure the applicant is aware of project submittal requirements.

Infrastructure

- Coordinate private developments and public Capital Improvements. Specific example, the newly constructed Infiniti Dealership on the south east corner of McHenry Avenue and Claratina Avenue.
- Improve Crows Landing Road including new paving, striping, and center dividers. This infrastructure update will improve the safety and attractiveness of the Crows Landing Road corridor and stimulate new investment in Modesto south of the Tuolumne River.
- Allow deferral of Capital Facilities Fees (CFF), Water Connection Fees, and/or Wastewater Capacity Fees for non-residential projects. Participants pay 20% of the fees at time of permit issuance and the balance, plus interest, is due over a five (5)-year period.
- Design and implement a high speed fiber network throughout the city that provides free Wi-Fi hot spots – especially in our Downtown core.

Downtown Vitality

- Improved Parking Management Model

  Downtown's current parking management model acts as a deterrent to both downtown patrons and employers because it is not designed to respond to market forces. The City is working with the newly formed Downtown Business Improvement District to explore mechanisms to make more parking and to establish fees that encourage investment.

- Downtown Form Based Code

  In 2010, the city of Modesto adopted its first form-based zoning code specific to downtown – creating the new Downtown Core Zone. The downtown Zone was expanded in 2015 to encompass the entire square mile of downtown. The city's intent is to become more open and friendly for developers and businesses interested in a downtown location.

This Downtown Zone facilitates a mixed-use downtown environment where people can shop, live, dine and work. The new downtown zone allows for a mixture of uses in a single building, without having to go through a costly and time consuming rezone effort required by the previous conventional zoning. New development projects that meet the form based code would be reviewed administratively.

This was done to streamline the "entitlement" process. It creates clearly delineated design principles focusing on the building's use and how the public will interact with the building and the areas around it – such as on the streets and sidewalks. In the new Downtown Zone, development will fit with the character of the neighborhood and create appropriate public and open spaces.

The Downtown Zone consists of six areas with criteria tailored to affected neighborhoods. For example, the downtown core allows greater intensity with buildings six to 15 stories tall, while other areas require lower heights, typically one to three stories. The recently completed Tower Park Senior Apartments at 17th and G streets followed the form-based approach to zoning and development.

Economic Development Partnerships

- Economic Development Practitioners Committee

  Hosted by Opportunity Stanislaus, the economic development representatives from the County and Cities meet monthly to share ideas to improve our business climate and standards of excellence in economic development.
- Grow Modesto Fund

  In October 2014, the City Council approved a partnership with the Fresno Community Development Financial Institution to administer Modesto's Community Development Block Grant Small Business Loan Program. This new program leverages local small business development resources and also leverages a dollar- for-dollar match with non-CDBG funds to be deployed to small businesses in Modesto and its Sphere of Influence to create and retain more jobs for low-to-moderate income persons.

- Stanislaus County Regional Tourism Roundtable

    The Stanislaus County Regional Tourism Roundtable promotes a regional perspective for economic development through local travel and tourism by including all County cities, chambers, and interested stakeholders in a collective marketing effort.

- Modesto Chamber Economic Development Committee

    Support efforts of the Land Use and Transportation Committee to unleash the economic potential of the Greater Modesto Area.

- Newly Formed Downtown Modesto Partnership

    Facilitate partnership's goal to build a positive image of Downtown Modesto by highlighting all the great things the community has to offer and bolstering services that improve sustainability and citizen experiences.

- Modesto Convention and Visitors Bureau

    The functions of the Convention and Visitors Bureau have been temporarily assumed by the City's Community & Economic Development Department. The County and City are participating in the Destination Modesto Task Force to develop an action plan for tourism.

Major Employers:

City of Modesto			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
E&J Gallo Winery	3,500	MFG	Winery
Seneca Foods	2,138	MFG	Fruit Products
Del Monte Foods	2,010	MFG	Fruit Products
Stanislaus Foods	1,875	MFG	Canning
Gallo Glass	1,000	MFG	Glass Containers
Frito-Lay	684	MFG	Snack Products
Foster Farms Dairy (Crystal Creamery)	520	MFG	Dairy Products
Stanislaus County	3,880	Non MFG	County Government
Modesto City Schools	3,500	Non MFG	Education District
Doctors Medical Center	2,600	Non MFG	Health Care
Memorial Medical Center	2,300	Non MFG	Health Care
Save Mart Supermarkets	1,650	Non MFG	Retail Grocer
Modesto Junior College	1,582	Non MFG	Education Institution
Stanislaus County Office of Education	1,371	Non MFG	Education District
City of Modesto	1,100	Non MFG	City Government
MedAmerica Billing Services	900	Non MFG	Medical Billing/Coding
Sylvan School District	875	Non MFG	Education District
Kaiser Permanente	800	Non MFG	Health Care
WalMart	745	Non MFG	Retailer
Costco	697	Non MFG	General Merchandise
Modesto Irrigation District	577	Non MFG	Water & Electric Utility
Sutter Gould Medical Foundation	564	Non MFG	Health Care

NEWMAN

Robert Martina, Mayor
Michael Holland, City Manager
209.862.3725

Introduction to City:

As a result of the growing importance of the surrounding agricultural lands and the arrival of the railroad to the community, the City of Newman (known as the jewel of the West Side) was Founded by Simon Newman in 1888 and incorporated as a City in 1908. Agriculture still continues to play an important role in the community, providing jobs and influencing the physical design of Newman. The City of Newman offers a variety of land and site uses ranging from agricultural operations to major retail; these sites include but aren't limited to highway/retail commercial, a large food processing facility, historic buildings, and a variety of light/heavy industrial. The City is continuing to focus its efforts on the revitalization of downtown and commercial and office development along the City's Highway 33 corridor. A primary goal of the City is to offer unique shops, services, restaurants, and additional retail development within both the downtown and highway corridor areas.

Nestled on the west side of Stanislaus County, Newman is called home by approximately 10,000 residents. Located directly on California's Highway 33 with a beautiful view of the Diablo Range, the City of Newman is sited in an agriculturally rich and naturally beautiful geographical area. The City of Newman is a General Law city that operates under the City Council/City Manager form of municipal government. The General Law format allows for citizens to elect a governing body that will set policy, pass ordinances and resolutions, and approve fiscal spending. With its slogan of “Honoring the Past, Celebrating the Present, Building for the Future” the City of Newman looks forward towards progress and has positive goals for the future while keeping its historical roots in place. Through its General and master plans, the City has consistently crafted its vision of the future. This vision includes a walkable community with an accessible and safe street grid while encouraging new employment opportunities to allow residents to work, shop and live within the community. Currently, the number of commuters traveling outside of Newman for their jobs is increasing with approximately 50 percent of Newman residents traveling more than 30 minutes to their job; the City would like to see these jobs available locally. To address housing, the City's master plan areas require a variety of housing types to provide housing to satisfy the public's needs, while limiting growth and protecting surrounding agricultural lands. Recently, the City was the first in the region to adopt an Urban Growth Boundary, further preserving valuable agricultural land whilst allowing for economic development These goals will assist the City in meeting the challenge of managing growth while enhancing the unique feel and character of Newman.

Presently, the City of Newman is a lovely small town with a vibrant historic downtown predominately surrounded by single family residential neighborhoods and then by agricultural and ranch lands. Made famous by the beautifully restored and active West Side Theatre, the downtown is centered along Main Street and consists of one and two story commercial buildings, many of which are historic and dating from the early 20th Century. Highway 33 also contains historical buildings with a mix of suburban and rural industrial and auto oriented commercial uses. The City’s industrial/manufacturing areas contain a variety of uses and have vested and shovel-ready parcels ready to be developed. With access to Rail, Highway 33 and Interstate 5, Newman is an ideal location to live and work.

Major Employers:

City of Newman			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Valley Sun Products	170	MFG	Sun Dried Tomatoes
Stewart & Jasper	152	MFG	Nut Grower/Processor
Saputo	123	MFG	Cheese Production
Newman Flange	71	MFG	Metal Flange Manufacturing
Cebro Frozen Foods	70	MFG	Frozen Vegetables
Westside Pallet Inc.	50	MFG	Pallets, Wood
Newman-Crows Landing Unified	331	Non MFG	School District
DiMare Brothers	165	Non MFG	Tomato Grower/Packer
San Luis Convalescence Hospital	63	Non MFG	Nursing and Residential Care
Raley's Supermarket	60	Non MFG	Retail Grocer
Avalon Care Center	52	Non MFG	Nursing and Residential Care
City of Newman	40	Non MFG	City Government

OAKDALE

Pat Paul, Mayor
Bryan Whitemyer, City Manager
209.845.3625

Introduction to City:

Situated near the Stanislaus River, Oakdale, so named for the groves of oak trees that line the hills, boasts an impressive history. In 1848, gold was discovered along the Stanislaus River by the natives living in the area and thousands of miners soon travelled through the area, following their dream to stake their claim to part of the mother lode. This stampede to the mine fields also brought representatives of the Stockton and Visalia Railroad to the area. Land was purchased and the railroad was extended from Stockton, thereby putting Oakdale on the map and creating our place in history as the gateway to the Sierras.

With the railroad extension to Oakdale, the town quickly became a freight center that created new business opportunities. A blacksmith, wagon shops and livery stables began operating to serve the needs of the miners. Hotels, dining halls, saloons, and general stores soon followed to accommodate the teamsters.

Oakdale was incorporated as a city in 1906 and continues to the present day as an important crossroads to the Central Sierras. An irrigation system was brought in by 1909, enabling ranchers to plant fruit and almond trees. This was followed by stockmen raising sheep, cattle, hogs and poultry, and operating dairy farms. Today, Oakdale is diverse, being both agricultural and industrial.

Oakdale is now a city of approximately 21,895 residents within an area encompassing 6.1 square miles. While Oakdale is considered a small city, it continues to be a desired community of choice with many residents working in town and an increasing number of them commuting to Modesto, Manteca, Tracy, and over the Altamont Pass to work sites in the East Bay Area.

Economic Development Focus:

The City of Oakdale has a rich agricultural and rural ranching heritage. Industrial activity is a major component of the City's economy which centers on agriculture, food manufacturing and tourism.

Manufacturing and food processing, packaging, and shipping companies are some of Oakdale's largest employers. The City is an attractive location for these businesses because of its proximity to productive farmlands and nearby rail lines that transport raw materials and agricultural products for processing and wholesale distribution. Opportunities exist for the City to build upon and diversify its existing job base, leverage its increasingly educated workforce, and capitalize on access to the future North County Corridor and the Oakdale Municipal Airport. Oakdale is home to large food manufacturing operations including Ball Western Can Company; ConAgra Foods, one of the largest tomato processing plants in the world; and Sconza Candy Company.

Economic Development Initiatives and Projects:

The 2030 General Plan (adopted August 8, 2013) addresses the City's goals for collaboration and workforce development. In the business community, the City will continue to build long-term partnerships with local business organizations to collaborate on economic development activities and to regularly provide input to the City on its services and development review and permit processes.

In addition, the City will continue to actively participate in regional economic development programs and organizations, such as the Stanislaus Economic Development and Opportunity Stanislaus, to promote local businesses and leverage City resources.

The City of Oakdale offers a variety of industrial and commercial property sites from two acres in size, many with rail access service from 3 different rail companies. For larger projects, the city has sites ranging from 70 to 200 acres. Oakdale actively works with new and existing businesses to encourage growth and ensure their success.

Oakdale's existing developed industrial area encompasses 500 acres within the city limits with approximately 45 acres vacant and available for development with adjacent sewer, water and underground utilities in place. Another 450 acres have been added to the city and planned for future industrial development pursuant to the adopted South Oakdale Industrial Specific Plan. All environmental review for this annexed area is complete and infrastructure planning has commenced.

The City has established Industrial Development Design Expectations, ensuring that new industrial and manufacturing and business centers are of high quality, protecting the value of private investment as well as enhancing Oakdale's unique community setting and environment.

It may be this combination of factors that prompted the relocation from Oakland, California, to Oakdale by Sconza Candy Company. In 2008, Sconza officials purchased an 80-acre developed industrial site from Hershey's Chocolate Company after Hershey's closed their west-coast plant and moved all their domestic manufacturing operations to Mexico.

With excellence in planning, coupled with an outstanding location and business environment, Oakdale is poised to remain the community of choice by businesses and employers for years to come.

Key Challenge:

A key challenge for Oakdale is to maintain and enhance their quality of life and special assets, and to use those assets as economic development tools for retaining and expanding local businesses, and attracting new business to the City. Helping local entrepreneurs and small businesses prosper and expand will be critical for the City's continued growth and development.

Major Employers:

City of Oakdale			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
ConAgra Foods	3,145	MFG	Tomato/Bean Processor
Ball Corporation	300	MFG	Metal Can Manufacturing
Sconza Candy	179	MFG	Confectionery Products
Oak Valley Hospital/Care	600	Non MFG	Health Care
Oakdale Joint Unified School	500	Non MFG	School District
Burchell Nursery	360	Non MFG	Fruit & Nut Tree Nursery
Gilton Solid Waste & Resource Recovery	191	Non MFG	Solid Waste
Raley's	101	Non MFG	Retail Grocer
K Mart	109	Non MFG	Retailer
City of Oakdale	97	Non MFG	City Government
Remediation Constructors	80	Non MFG	Construction
A.L. Gilbert	77	Non MFG	Feed and Grain
Save Mart Supermarkets	74	Non MFG	Retail Grocer
Oakdale Irrigation District	65	Non MFG	Water Utility
Oakvalley Community Bank	59	Non MFG	Bank

PATTERSON

Deborah M. Novelli, Mayor
Ken Irwin, City Manager
209.895.8000

Introduction to City:

Patterson, incorporated in 1919, is a growing community averaging a 6% annual growth rate since 1990 and its current population is approximately 22,000. Strategically located in the western part of Stanislaus County near Interstate I-5, the City derives much of its economic vitality from agriculture, food processing, and distribution.

The City's street layout, inspired by the great metro areas of Paris and Washington D.C., features a circular format in the central district surrounded by radiating spokes, many trees and palm-lined thoroughfares.

Patterson is also home to a rapidly expanding business park. Because of its proximity to the San Francisco Bay Area and Highway 5, Patterson is positioned to absorb a considerable share of growth over the coming years. There are many opportunities for retailers, fulfillment centers, and light manufacturing companies.

The West Patterson Business Park provides easy access to transportation options and tremendous potential for growth. The Business Park consists of 814 acres with a diverse range of parcel sizes, ready-to-build sites, and several flex buildings ready for tenants. In 2013 the City of Patterson annexed approximately 776 acres of industrial property and 105 acres of commercial/retail properties. The Business Parks have enticed several large distribution Centers, such as Kohls, CVS, Amazon, and Restoration hardware. To date these businesses have created over 2000 new jobs that have benefitted Patterson as well as our other Cities in Stanislaus County. These sites are all shovel ready and fully entitled. The Business Park is located within an area of seismic stability and minimal flood risk.

Located along Interstate 5 with access to I-205 and I-580 as well as Highways 120 and 99, Patterson provides business with convenient, and less congested, access to the major metropolitan markets of Northern and Southern California.

Patterson is located just 70 miles east of the Port of Oakland (the nation's third busiest port), 40 miles south of the Port of Stockton, 280 miles north of Los Angeles, 92 miles south of Sacramento and 89 miles southeast of San Francisco.

Along with its central location, Patterson offers access to many transportation options. The seaports at Oakland and Stockton provide access to maritime transport. Several nearby airports offer a variety of flight options including local service out of Modesto and international service out of Oakland and Sacramento. Rail transportation is highly-accessible and convenient. The Central Valley is the confluence point for two national rail lines - the Burlington Northern Santa Fe and the Union Pacific Railroad. Additionally, local daily service is provided by the California Northern Railroad.

The City offers competitive fees to invite businesses to Patterson. The City offers a concurrent plan check and one-stop permitting process. The majority of properties zoned for commercial use are located within a California Enterprise Zone.

Economic Development Focus and Priorities:

During the 2015-2016 fiscal year the City performed a strategic planning process. We were very fortunate to have a good turnout of private citizens and local business owners participate. The strategic plan will provide guidance to city government to align with our council and resident's vision for growth of our fast growing city.

Several properties located along Sperry Avenue, Ward Avenue, West Las Palmas Avenue and Ninth Street will enhance and improve the opportunities for the City of Patterson to entice much needed retail and other opportunities for the benefit of its citizens. The full development of these sites will stem the retail and other economic leakage that currently exists within the City of Patterson resulting in its citizens spending their shopping, dining, and other activity dollars in the surrounding communities.

Although the Economic Development Agency no longer exists, we hope to find creative funding encouraging both municipal and community growth opportunities. By improving our municipal infrastructure to create new and expanded retail opportunities for the community and support of existing businesses will help create new jobs during its infrastructure development and permanent retail phases providing for a financially sustainable community.

The jobs created during the municipal and public improvement phases will provide much needed local and regional employment during our historically high unemployment while the long term use of these improvements will create sustained local and regional employment, retail opportunities and tax generation by private and institutional investors who will now have the cornerstone of basic infrastructure to allow professional developers to build out these needed business and retail investments to create a sustainable economic base for the betterment of the region and city.

Though the limited and shrinking base of governmental economic development funds has become extremely competitive; the magnitude of the economic potential received from the use of the requested funds will spur private and institutional capital investment and will become the catalyst needed to be successful from a magnitude of governmental and private capital sources. The USDA and HUD funding in addition to other governmental incentive programs that the region qualifies for establishes multiple and combined funding opportunities including public and private partnerships.

This investment will improve the municipal improvements surrounding properties located in the heart of the City of Patterson allowing private and institutional investors to continue the pattern of existing retail development and establish a regional retail core of commercial and personal service opportunities for the community of Patterson as well as critical support of the surrounding Westside communities and farming operations for years to come. Some of our most recent commercial developments include nationally established businesses, such as Flying J, Wendy's, and Les Schwab, and local businesses such as Prime Shine.

The City of Patterson has approved and well established project design standards and procedures to ensure these improvements will be constructed and maintained to best serve the public. The City has also created a new Engineering Department to make sure the City's infrastructure needs are met. The land owners and its development partners have an established record of successful retail and community developments to complete the next phase of enticing, selling and developing the commercial opportunities needed to complete the City's goal of establishing a sustainable retail and jobs oriented campus for the financial support and success of the community.

Given the expansion and evolution of the central valley from Americas' Breadbasket to include vibrant business, industrial and residential communities to complement and support its core enterprise. The master planned community of Patterson plays a pivotal role in providing the retail, personal and industry services to preserve and protect the fragile environment of the central valley in coordination with a wide spectrum of local, regional and Federal agencies.

Major Employers:

City of Patterson			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Traina Dried Fruits	170	MFG	Sun Dried Tomatoes/Fruits
Amazon	750	Non MFG	Distribution Center
Patterson Unified School District	568	Non MFG	School District
CVS Caremark	491	Non MFG	Distribution Center
W. W. Grainger	260	Non MFG	Distribution Center
WalMart	220	Non MFG	Retailer
Stewart & Jasper Marketing, Inc.	171	Non MFG	Retailer
Restoration Hardware	154	Non MFG	Distribution Center
Kohl's Distribution Center	123	Non MFG	Distribution Center
City of Patterson	97	Non MFG	City Government
Save Mart Supermarkets	93	Non MFG	Retail Grocer
Affina	84	Non MFG	Distribution Center
Del Puerto Health Care District	53	Non MFG	Health Care

RIVERBANK

Richard O'Brien, Mayor
Sean Scully, City Manager
209.869.7116

Introduction to City:

Riverbank is a progressive, growing community with over 23,000 residents which is located eight miles north-east of Modesto. Nestled along the Stanislaus River and State Highway 108, Riverbank offers a wide variety of recreational, cultural, and social activities for people of all ages. Agriculture and food processing are important aspects of the local community which proudly hosts the Riverbank Annual Cheese and Wine Exposition every October.

Riverbank is also attracting and cultivating a growing number of commercial, industrial, and retail businesses along its southern and eastern boundaries, in large part due to the expansion of the Crossroads Shopping Center and the closure of the Riverbank Army Ammunitions Plant (RAAP). Many of the new businesses are in the sustainable, green or clean-tech sector, creating a new business cluster that has the potential to transform the local economy and spur on job growth.

Economic Development Focus and Priorities

The City of Riverbank has focused economic development priorities in several areas. The key areas of focus are:

- Identify and develop a brand for the City of Riverbank that showcases the relative strengths of growing a business here;
- Ensure a timely and predictable permitting process;
- Recruit and secure new businesses in priority locations and industries; and
- Maintain and expand the infrastructure that businesses need to thrive.

Key projects areas in Riverbank include further development at the Riverbank Industrial Complex (the former Riverbank Army Ammunition Plant), the site of the former Sun Garden-Gangi Canning Company and expansion of the Crossroads Shopping Center.

Economic Development Initiatives and Projects:

Siding and Roof Replacement at the Former Riverbank Army Ammunition Plant

Project funds are needed to replace approximately 350,992 sq. ft. of siding and 515,650 sq. ft. of roofing that is being removed and disposed of as part of an Army-led remediation project approved of by the US Environmental Protection Agency. Under an EPA and Army agreement, the Army is required to remove and dispose roofing and siding material due contaminated with non-liquid PCBs, but they are not required to replace the material, rendering the buildings uninhabitable unless the roof and siding is replaced. The buildings are currently home to 40 growing businesses and several hundred employees.

The installation of new roofs and siding will ensure that the site's building infrastructure meets health and safety standards and is adequate to support manufacturing and industrial capabilities in a sustainable, energy efficient environment.

Replacement Area		
Siding	Roofing - Sloped	Roofing - Flat
350,992 sq. ft.	515,650 sq. ft.	159,026 sq. ft.

Estimated Project Cost			
Siding	Roofing - Sloped	Roofing - Flat	Total Project Cost
$2,357,667	$3,445,402	$728,975	$6,532,044

The site has completed a National Environmental Protection Act (NEPA) and an Environmental Impact Report (EIR). A Finding of Suitability for Early Transfer is being circulated to regulatory agencies for final review. Early transfer documents have been prepared and conveyance by deed is expected upon Governor's signature of the early transfer documents.

Project Budget

Federal Investment:

EDA Funds Request $ 2,500,000

Local Investment:

From Industrial Site Revenue

State grants and loans $ 4,032,044

Project Readiness:

EDA is familiar with BRAC facilities and their unique circumstances. The project presented is ready to start upon funding approval.

Major Employers:

City of Riverbank			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Monschein Industries	220	MFG	Cabinet Manufacturing
Silgan Containers	75	MFG	Metal Food Containers
Riverbank Unified School District	330	Non MFG	School District
Target	185	Non MFG	Retailer
Kohl's Dept. Store	180	Non MFG	Retailer
Home Depot	160	Non MFG	Retailer
Econtactlive, Inc.	100	Non MFG	Business Support
Save Mart Supermarkets	95	Non MFG	Retail Grocer
Riverbank Nursing Center	78	Non MFG	Health Care
City of Riverbank	70	Non MFG	City Government
O'Brien's Market	53	Non MFG	Retail Grocer

TURLOCK

Gary Soiseth, Mayor
Gary Hampton, City Manager
209.668.5540

Introduction to City:

Turlock is a city on the move and has a vision for its future. As a thriving community of over 70,000 in the heart of California's Central Valley, Turlock has held firm to its agricultural roots while diversifying economically and expanding opportunities for its residents. It has become a very desirable community, attracting many people to both live and work locally. The City's rapid growth is expected to continue, adding some 35,000 new residents over the next 20 years. The City of Turlock has recently adopted a new General Plan to guide that growth and development.

Turlock has had a long history of planning. A general plan for the City was prepared in the early 1950s, and although it was never adopted, it served as a point of departure for future plans. The General Plan prepared in 1969, much before general plans acquired their present political and legal stature, addressed such contemporary issues as urban sprawl and unnecessary destruction of farmland, and was updated in the early 1980s. The next General Plan (formally adopted in 1993 and partially updated in 2002) has served the City well, guiding the creation of attractive new neighborhoods, parks, and major new retail and employment areas.

Population and economic growth in Turlock are intertwined. The city seeks to attract new industries and create jobs in order to boost revenue, remain competitive, attract new residents and provide opportunities for existing ones. The growing resident population demands increased goods and services which in turn fuel economic growth. The City of Turlock General Plan as well as the Westside Industrial Specific Plan creates a multi-pronged approach to economic development in order to achieve these goals: supporting the build out of the Turlock Regional Industrial Park (established by the Westside Industrial Specific Plan), drawing new businesses Downtown, identifying new industries to target, and building on existing assets such as California State University, Stanislaus.

Turlock's current land use pattern and built form are products of the City's historical growth within an agricultural area. Turlock was incorporated in 1908. Like many San Joaquin Valley towns from the time period, the original downtown core was focused around the railroad station, with streets arranged in a grid oriented to the tracks. The town proceeded to grow outward, shifting to an orthogonal north-south grid matching the rural road and parcel pattern around it. Golden State Boulevard, paralleling the railroad, was part of the original highway through the Central Valley, which became U.S. 99 roadway in 1926.

It is the City's goal to continue to provide a balance of jobs and housing in Turlock, which stimulates the local economy, reduces commuting, and maintains Turlock's competitiveness in the region. Therefore, the master planning process has extended to the non-residential sector, as well. In 2006, Turlock completed the Westside Industrial Specific Plan (WISP), which identified land use, transportation improvements, infrastructure improvements, and design guidelines for industrial and business park uses for some 2,500 acres west of Route 99. Aided by this specific plan, the city's industrial sector is expanding and shifting to this area.

Industrial Areas

Turlock's agricultural setting has historically provided a basis for the City's industry. Food processing is the primary industry, providing the largest number of industrial jobs in Turlock. Four of the top ten employers in the city are food processors, and Foster Farms, the third-largest employer in the city, employs 1,500 workers. Fourteen percent of jobs in Turlock are in manufacturing, and four percent are in the warehousing and transportation industries, which are large users of industrial space. Turlock boasts an agri-business industry cluster with several new emerging technical software and laboratories and other related sectors to bolster this cluster.

Economic Development

Through the creation and implementation of the Westside Industrial Specific Plan (WISP), Turlock has reaffirmed the continuing importance of industrial development as a main source of jobs and economic growth in the City. This Plan involved the development of a Master Plan and Certified Environmental Impact Report for an area of approximately 2600 acres immediately adjacent to Highway 99 with the goal to create jobs. Adequate sewer and water capacity exists and a majority of the land is zoned industrial, with approximately eight percent devoted to commercial and office uses. The City and former Turlock Redevelopment Agency made significant contributions ($15 million) to construct essential backbone infrastructure to create shovel ready ground to attract industrial development.

Economic Development Focus and Priorities:

The fundamental purpose of the Westside Industrial Specific Plan (WISP) is to implement the General Plan goal for a major industrial center in the City of Turlock. The Specific Plan provides the project vision and objectives, and establishes development policies: land use regulations, design standards, and a phasing plan that will guide the orderly growth of the existing and new industrial uses. The Specific Plan will accommodate growth of light and heavy industrial uses similar to those currently located in the Plan Area.

The Specific Plan will also accommodate and nurture the development of an Agri-Science Industry Cluster (referred to as the “Agri-Science Cluster”). The cluster is planned as a center for research and development, manufacture, processing, and celebration of agriculture and food products in the San Joaquin Valley. The Plan Area includes 2,615 gross acres allocated in a mix of industrial, industrial/business-professional, office, and commercial uses.

The Infrastructure Plan deals with public facilities and services required in the Plan Area. This includes all components of the transportation system, sewer, water, drainage, electric power, natural gas, communications, recreation and parks, fire protection, and solid waste management. Because the Plan Area land uses do not include residential (other than existing residences), the public services discussion does not include those services that would normally be associated with a residential use such as schools and libraries.

The Westside Industrial Specific Plan was developed in response to economic development opportunities over a period of years. Many of the infrastructure improvements required to serve development has and will occur on an incremental basis that corresponds to specific development proposals. Development of each area within the Turlock Regional Industrial Park (TRIP) has responded to landowner and developer interests. Front loading infrastructure through the use of redevelopment agency dollars has created “shovel ready” areas of the TRIP. However, conventional phasing that identifies a specific sequence of development has not proven to be a practical approach to the development of this area.

The infrastructure requirements for each sub area of development include all roadway, sewer, water, reclaimed water, storm drainage, and dry utilities necessary for that sub area to develop. Development will occur within a sub area where the backbone infrastructure is completed and available, although subareas may be combined and interim improvements may allow for development of only a portion of a sub area. The City of Turlock intends to submit grant applications to various state and federal agencies to assist in the capital projects to bring additional parcels to “shovel ready” status.

Project Description(s):

Turlock Regional Industrial Park Infrastructure Project – Phase 2

The City proposes to construct additional infrastructure improvements that includes water and sewer lines as well as road improvements through the southern loop sub area of the Turlock Regional Industrial Park. As new firms have located into the Turlock Regional Industrial Park, there is a need to open and prepare sites in the southern portion of the TRIP for additional development and job growth. There are preliminary discussions with several firms who are attracted to this southern area because of the potential to connect with the current rail service in the area. The current project, as designed requires the installation of approximately $6.7 million in infrastructure improvements. The City of Turlock Believe that this will spur an additional economic growth as was seen in the Phase 1 of the project that was funded through water bonds and former redevelopment agency funds. Both funds are no longer available as a financing tool.

Phase 1 has brought the following economic development and job growth:

- Construction of the Blue Diamond Almond Growers Processing Facility with more than a $100 million investment that has already created almost 150 jobs. Blue Diamond anticipates adding an additional 150 jobs in the next year. There are three more phases of expansion planned that will create additional jobs.

- The Hilmar Cheese Co. is investing $75 million to $100 million to build a milk powder processing plant in Turlock. The plant will create 40 full-time jobs, plus expansion opportunities for dairies and related industries in Stanislaus and Merced counties.
- US Cold Storage has constructed a 3.5-million-cubic-foot expansion. The project will add three new storage rooms (including two convertible-temp rooms) and 16,000 more pallet positions. Upon completion, Turlock will have as many as 40,000 pallet positions and officials expect to hire more than 100 employees.
- Sensient Dehydrated Foods, a 227,000-square-foot warehouse showroom additional that added more than 20 jobs to their 100 plus workforce.
- Valley Milk LLC, is currently in construction of a new dehydrated milk facility also located in the north regional of the Turlock Regional Industrial Park. This plan will create another 50 full time jobs as well as provide additional demand for local milk producers.

North Valley Regional Recycled Water Program (NVRRWP)

This program is designed as a regional solution to address California's water crisis by making tertiary-treated recycled water available to the drought-impacted west side of several California counties (Stanislaus, San Joaquin, and Merced Counties) for farmland irrigation. Current participants in the NVRRWP include the Cities of Modesto, Ceres, Turlock, Stanislaus County, and the Del Puerto Water District on the west side of the San Joaquin Valley. Modesto and Turlock currently produce recycled water and provide wastewater treatment for communities in Stanislaus County.

Essentially, the project would consist of: (1) in the short term, upgrades to San Joaquin River diversion facilities to enable Modesto's and Turlock's recycled water to be either diverted from the San Joaquin River and delivered to Del Puerto Water District via the Delta Mendota Canal (2) in the long term a dedicated pipeline will be constructed directly to Del Puerto Water District facilities. These facilities would allow near and long-term delivery of recycled water for irrigation of lands in the Del Puerto Water District.

The City of Turlock and Modesto both treat either all or a portion of their wastewater to tertiary standards meeting Title 22 standards. Modesto has a

2.5 MGD facility online and is in the beginning phases of a 100 plus million dollar SRF loan for construction for full tertiary for all of their wastewater inflow. Turlock has had full tertiary treatment since 2006, currently producing of 10 MGD. Turlock has also begun construction of a 36” pipeline directly to the San Joaquin River funded by a $20 million dollar SRF loan. As a part of the proposed NVRRWP, this pipeline will be joined with the City of Modesto facilities and extended across the San Joaquin River to Del Puerto Water District facilities.

This project provides environmental and economic benefits in the near-term, while meeting long-term water supply and environmental objectives. This project could provide affordable recycled water to agricultural customers in the Del Puerto Water District as early as 2016. By implementing the project, productive agricultural lands can be brought back into full production and the North Valley communities can recognize an additional $29 million in total annual income with the creation of more than 572 permanent jobs. Additional jobs associated with project construction would also be created during project implementation.

The environmental benefits are also significant. The project will reduce the reliance on unsustainable area groundwater supplies south of the Delta and on pumped Delta water supplies. The NVRRWP will meet the recycled water goals and mandates of the State of California.

The NVRRWP could produce and deliver up to 32,900 acre-feet per year of tertiary-treated recycled water -- worth an estimated total annual economic output of $67.5 million - to the drought-impacted west side. This water can be used to irrigate food crops, public and privately owned landscaping, and for industrial uses.

The economic benefits of the NVRRWP are substantial. The project will provide irrigation for approximately 10,966 acres of prime agricultural land with an estimated total annual income of $29 million. The $29 million total annual income is estimated to generate an additional $67.5 million per year to the region's economy in indirect and induced impacts (this is based on an economic analysis completed by the University of the Pacific's Dr. Jeffrey Michael using the IMPLAN model). The five-year cumulative economic value to the region is expected to be $206.5 million.

The NVRRWP is estimated to create approximately 572 on-going jobs (this number does not include the project-related construction jobs) to an area that has a 12.2% unemployment rate.

Master Plan for Rail Revitalization

This project is a two-phased project. The first phase includes addressing some significant deficiencies in the infrastructure of this 80 year old industrial areas of Turlock. More than 2,000 jobs are located in this industrial areas near the downtown. However, some of the failing infrastructures such as the streets and storm water systems have precluded new firms from coming in to re-use some of these small, older manufacturing buildings. This project would assist in funding a portion of the infrastructure upgrades and leverage other funds, including private investment to revitalize this aging but vital area of Turlock.

The second phase of the project is the development of a Turlock Railroad Master Plan (TRMP) focused on developing a coordinated, comprehensive master plan outlining achievable projects that will improve transportation mobility in Turlock between and among Union Pacific and the Tidewater Railroads. The specific goals of the Master Plan would be to promote efficient transportation systems management and operation, and to support regional economic vitality and revitalization.

The TRMP is proposed to be a long-range planning document that is intended to guide redevelopment of the local rail system in Turlock into a vibrant, mixed-use employment center that includes commercial, office, light industrial and institutional uses. In order to fulfil the vision for redevelopment of rail in Turlock the TRMP proposes to provide the necessary framework to direct new development that respects the historic condition and context of the existing rail facilities and their adjacent properties.

The NVRRWP is estimated to create approximately 572 on-going jobs (this number does not include the project-related construction jobs) to an area that has a 17.2% unemployment rate.

Food Innovation and Commercialization Center

This project proposes to develop a collaborative project with Opportunity Stanislaus to construct the Turlock Food Product Innovation and

Commercialization Center (FoodPIC) that will offer incubator space, as well as marketing and development services to companies in the food processing industry pursuing new product lines.

This program is patterned after a similar program that was initiated by the faculty of the department of food science and technology in the College of Agricultural and Environmental Sciences and associates of the University of Georgia. It is internationally recognized for development of innovative food products and discovery, for implementation of cutting-edge science and technology, and for developing innovative food products. The program forms a strategic alliance with external marketing, technology, and engineering groups to help food companies take a new product from conception, through consumer research, formulation, prototyping, shelf-life analysis, and market launch.

The Center will field test products for both domestic and export purposes and will help support the growth of the region's agricultural cluster and help counter losses to manufacturing and other industries in central California.

The Food Innovation and Commercialization Center effort is estimated to create approximately 57 on-going jobs (this number does not include the project-related construction jobs) to an area that has a 12.2% unemployment rate and would be included in a low income census tract that is classified as a Food Dessert.

Major Employers:

City of Turlock			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Foster Farms Poultry	1,484	MFG	Poultry Processor
Sensient Dehydrated Flavors	300	MFG	Food Processor
Mid-Valley Dairy	215	MFG	Dairy Products
Blue Diamond Growers	145	MFG	Nut Processor
Evergreen Packaging	126	MFG	Beverage Packaging
SupHerb Farms	120	MFG	Culinary Herbs & Blends
Turlock Unified School District	1,778	Non MFG	School District
Emanuel Medical Center	1,250	Non MFG	Health Care
CSU Stanislaus	1,020	Non MFG	Public University
City of Turlock	580	Non MFG	City Government
TID	438	Non MFG	Water & Electric Utility
Crimetek Security	400	Non MFG	Investigation & Security
WalMart	320	Non MFG	Retailer
Costco	300	Non MFG	Retailer
Covenant Retirement & Care	265	Non MFG	Nursing & Residential Care
Target	250	Non MFG	Retailer
Home Depot	150	Non MFG	Building Materials
Save Mart Supermarkets	133	Non MFG	Retail Grocer
Northern Refrigerated Transport	120	Non MFG	Freight Trucking
Raley's	110	Non MFG	Retail Grocer

WATERFORD
Michael Van Winkle, Mayor
Sean Scully, City Manager
209.874.2328

Introduction to City:

The first modern record (1850's) of permanent residents in Waterford, other than the Native Americans that long frequented the area, were the homesteading and farming activities of William Wilkerson Baker. The main economic activities were agriculture and fishing as well as commerce with the nearby gold mining communities. Reflecting the area's river fording characteristics, the name of Waterford was eventually chosen.

Bordered by the Tuolumne River and known as a key gateway to the area's lakes, Yosemite National Park and other natural amenities, Waterford is being discovered as a place with a high quality of life that has a lot to offer. This premise has been verified by recent quality developments underway in Waterford. The future looks bright. Residents of and visitors to Waterford enjoy a full spectrum of year-round recreational activities. Seven lakes within a twenty-mile radius provide fishing, boating, camping and waterskiing opportunities.

The City of Waterford is currently the lowest generating sales tax city in Stanislaus County, even though it is not the smallest in population. This is partly due to the lower overall City per capita income, but is due mostly to the absence of attractive, local shopping destinations, where over $90 million in sales tax leakage occurs. Other than the school employment, agriculture and gas stations are the main economic and employment drivers in the City.

The downtown has several vacant commercial properties due to absentee landlords and inability to find tenants. The downtown has recently been improved with an award-winning downtown renovation project. The improved downtown is hoping to draw new restaurants, antique shops, and other stores that can make it vibrant, attractive and an asset to the city as a whole. Several annual events draw several thousand visitors to the downtown and new tenants will benefit from these audiences.

Major Employers:

City of Waterford			
COMPANY OR ORGANIZATION	**EMPLOYEES**	**CATEGORY**	**DESCRIPTIVE**
Frazier Nut Farms	80	MFG	Walnut Grower/Processor
Montipelier Orchards	48	MFG	Almond Grower/Processor
Waterford Nut Company	48	MFG	Almond Grower/Processor
Roberts Ferry Nut Company	12	MFG	Almond Grower/Processor
Waterford Unified School District	285	Non MFG	School District
Valley IGA Plus	46	Non MFG	Retail Grocer
Waterford Child Development	22	Non MFG	Social Assistance
City of Waterford	15	Non MFG	City Government

STANISLAUS COUNTY

Vito Chiesa, Chairman of the Board of Supervisors
Stan Risen, Chief Executive Officer
209.525.6333

Introduction to the County:

Stanislaus County is located in Central California within 90 minutes of the San Francisco Bay Area, the Silicon Valley, Sacramento, the Sierra Nevada Mountains and California's Central Coast. With approximately 532,000 people calling this area home, our community reflects a region rich in diversity with a strong sense of community.

Two of California's major north-south transportation routes (Interstate 5 and Highway 99) intersect the area and the County has quickly become one of the dominant logistics center locations on the west coast.

The County is home to a vibrant arts community with the world-class Gallo Center for the Arts, a symphony orchestra, and abundant visual and performing arts.

Stanislaus County is a global center for agribusiness, positioned by its mild Mediterranean climate, rich soils and progressive farming practices. The area is recognized internationally for agricultural innovation with wine, almonds, poultry, milk, cattle, and walnuts being some of our featured industries.

The County was established in 1854 and has a total land area of 1,494 square miles. Temperatures range from an average low of 38 degrees Fahrenheit in the winter to an average high of 85 degrees Fahrenheit during the spring and fall season. Temperatures move up into the 90's during the summer months with a low humidity and cooling evening breezes from the San Joaquin Delta.

Economy:

Stanislaus County is an international agri-business powerhouse. The value of agricultural commodities produced in 2015 was nearly $3.9 billion. Almonds are the number one commodity at $1.3 billion, followed by milk at $647.8 million in value.

Farmers in Stanislaus County export more than 133 commodities to 109 countries around the world. Spain receives 10% of exports followed by Japan and Hong Kong at 9% with Germany and Turkey at 7% and South Korea at 6% of exports. Approximately 8,860 export certificates were issued in 2015 and 10,800 export certificates were issued in 2016.

Economic Development Initiative and Project:

Stanislaus County continues to work toward final CEQA certification and approvals for the development of the former military air facility at Crows Landing on the west side of Stanislaus County.

The project, the Crows Landing Industrial Business Park (CLIBP) consists of approximately 1,528 gross acres, of which 880 net acres are designated for industrial uses and have the potential to support approximately 15 million square feet of built inventory over the next several decades. The site is oriented toward I-5, with the nearest entrance located less than 2 miles from I-5.

Approximately 17,000 workers from the manufacturing, transportation, and wholesale sectors live within a 30-minute drive of the site. The CLIBP would provide residents of the market area (over 60,000 in the tri-county area) an alternative to traveling out of county at an even greater distance from their homes (as roughly 40% of employed workers living in the market area currently do). This project would provide the region's sizable unemployed/ underemployed workforce a more convenient work site.

The local industrial real estate market continues to show steady signs of improvement demonstrating six consecutive quarters of positive net absorption.[2] In calendar year 2013, the Stanislaus and San Joaquin counties area absorbed approximately 5.9 million square net feet of industrial space. This is significantly higher than average annual absorption since 2008, which was approximately 2.4 million square feet per year. This corresponds with

[2] Absorption refers to the change in physically occupied space during a given time period. Net absorption can be positive or negative. An example is when a tenant moves into a new location (positive absorption) and vacates its former space (negative absorption). The net change is measured as the amount of new space less the amount of vacated space. If the new location is larger than the former location, there is positive net absorption. If the new location is smaller than the former, there is negative net absorption. AECOM CLIBP Market and Absorption Analysis September 22, 2014.

strong year-over-year employment growth in industries that demand industrial space. From a pricing perspective, we anticipate that vacancy rates will continue to decline and expect to see upward pressure on lease rates as well as higher prices for industrial land and buildings. This near-term strengthening in market conditions has been responsible for the re-emergence of speculative construction, built-to-suit spaces, and building expansion activity.

While the CLIBP site is oriented toward Interstate 5 (I-5), establishing a viable connection to I-5 is critical to CLIBP's success. Recent distribution development in the City of Patterson, 2.2 miles to the North, has established the corridor as a prime location for logistics use. The two strongest advantages offered by the proposed CLIPB are its potential to support opportunities for large building footprints and its potential to offer cost advantages. However, given the level of planned and proposed development in the regional pipeline, timing is critical to bring CLIBP to market.

Over the next 12 months, Stanislaus County will be seeking various funding opportunities to assist with critical infrastructure necessary to bring this significant jobs creating project on line. Phase IA estimates for initial infrastructure which include roadway improvements, wet and dry utilities and potable/non-potable water options are estimated at $29.6 million dollars.

Currently, absorption analysis estimates that demand for CLIBP could range from approximately 250,000 to 350,000 square feet per year or 7.5 to 10.5 million total square feet over a 30-year period.

This absorption estimate translates to average annual development at CLIBP between 14 to 20 net acres per year assuming a 0.4 floor area ratio (FAR)[3]. Other uses, such as office use, were not included in the absorption estimate because these uses are unlikely to compose a significant component of future development at CLIBP. All indicators (regional trends) anticipate that planning for CLIBP absorption should utilize the mid- to high-growth scenario, which would suggest achievable (conservative) absorption of approximately 520 to 600 net acres over the next 30 years.

Phase 1A projects include:

- Traffic and Road Infrastructure
- Sewer backbone
- Potable and non-potable water backbone
- Stormwater management
- Dry utilities
- Airport planning

[3] This FAR was selected by the County Project Team as a planning factor to estimate net land area associated with projected levels of industrial square feet demanded. Research suggests that FARs in the region typically range from 0.35 to 0.40.

Committee Recommendations

COMMITTEE RECOMMENDATIONS

EDA determines regional eligibility for a Public Works or an Economic Adjustment Assistance investment based on the unemployment rate, per capita personal income, or a special need in the region in which the project will be located.

For economic distress levels based on the unemployment rate, EDA will base its determination upon the most recent American Community Survey (ACS) published by the US Census Bureau.

If a recent ACS is not available, EDA will base its decision on the most recent Federal data from other sources. If no Federal data is available, an applicant must submit to EDA the most recent data available from the State.

Generally, the amount of the EDA grant may not exceed fifty (50) percent of the total cost of the project. During the pre-application process, the EDA regional representative will assess and evaluate the current community stress points and determine whether any additional matching fund break can be leveraged for a candidate project.

Economic Issues Facing Stanislaus County

Stanislaus County continues to be one of the counties in the State of California with a growing population. However, nearly one fourth (22.8%) of our adults 25+ years of age are without a High School Diploma and 19.5% of our population is in poverty. We need to focus on the future of our residents and their economic improvement. The economy continues to be based upon agriculture and food manufacturing which inherently causes significant seasonality in employment cycles and unemployment rates. In order to address these issues and strengthen local and regional economies, the communities of Stanislaus will need to continue to diversify and strive to better prepare and develop the workforce with the skills and technology awareness to make locations attractive to new clusters and expanded, non-agricultural employment sectors.

Development Strategy: Goals and Priorities

First and foremost, the priority objective of this Comprehensive Economic Development Strategy (CEDS) strategic effort is to inspire and facilitate future investments in infrastructure – both physical and human so as to maintain a competitive place in the economic development future of the San Joaquin Valley.

In addition, it is important to the Stanislaus County Economic Development Action Committee (EDAC), through the development of this CEDS, to continue an alignment of efforts with those identified in the broader eight county economic development strategic efforts. To that end, development goals and priorities are consistent with regional objectives and include:

- **Encourage and support new business innovation and entrepreneurs;**
- **Promote the region as a tourism destination;**
- **Encourage the further development of a vibrant ag-based economy looking for ways to add new products, generate food and beverage innovation, and promote our products and services;**
- **Develop specialized education including higher education, career technical education, and workforce development;**
- **Support the development of college level program infrastructure to provide opportunities for students to learn and stay here;**
- **Enhance goods movement transportation projects that build capacity while increasing safety, decreasing congestion, improving air quality and promoting economic development;**
- **Develop wet and dry utility infrastructure to increase business development interest;**
- **Participate in the development of comprehensive regional water planning;**
- **Continue to promote accessibility and utilization of advanced communications services (through targeted technology training efforts, etc.) as fundamental and necessary for all residents and businesses.**

These primary themes will serve as the general parameter for the Stanislaus County CEDS development process over the next performance and implementation cycle. It is the intention of the Stanislaus Economic Development Action Committee to continue to review this strategy, themes and projects on an annual basis moving forward.

APPENDIX A

Stanislaus Layoffs 2005 - 2016		Total	8,216	
Year	**Company**	**Product/Service**	**Job (-)**	**City**
2016	SPX FLOW, Inc.	Food Manufacturing	8	Modesto
2016	Sutter Central Valley Hospitals dba	Healthcare	96	Modesto
2016	CST California Stations, Inc.	Retailer	7	Oakdale
2016	American Medical Response	Healthcare Services	8	Modesto
2016	DCS Facility Services	Social Services	11	Modesto
2016	Sutter VNA & Hospice	Healthcare Services	14	Modesto
2016	BlueScope Buildings North America	Manufacturing	51	Turlock
2015	Suchman, LLC	Professional Services	21	Modesto
2015	Centrex	Construction	163	Modesto
2015	Scarbrough Management Corp.	Retail (Burger King)	177	Modesto
2015	Olam West Coast	Food Manufacturer	65	Modesto
2015	AM2T	Metal Manufacturer	32	Riverbank
2015	Medic Alert	Health Care Monitoring	31	Turlock
2014	AQH	Data Processing	10	Riverbank
2013	Sam's Food City	Retailer	70	Modesto & Turlock
2013	Zacky Farms	Agriculture	9	Various
2013	Memorial Medical Center	Healthcare	114	Modesto
2013	SaveMart	Retailer	TBD	Modesto
2013	Blockbuster	Entertainment	20	Modesto
2013	International Paper	Packaging	136	Modesto SOI
2013	Oak Valley Hospital	Healthcare	20	Oakdale
2013	Post Foods	Food Processing	140	Modesto
2013	Repsco	Plastic Slipsheets/Pallets	9	Riverbank
2013	Hormel	Food Processing	163	Turlock
2012	CVS Caremark	Distribution Center	103	Patterson
2012	Dawn Food Products	Food Processing	265	Modesto SOI
2012	Hostess Brands	Bakery	23	Modesto
2012	Raley's	Retailer	71	Modesto
2012	Patterson Vegetable Company LLC	Food Processing	526	Patterson
2012	Xpal Power	Portable Power Products	6	Modesto
2012	MV Transportation	Transportation	114	Modesto
2012	United Rentals	Back Office	29	Oakdale
2012	Richland Market	Retailer	35	Ceres
2012	Mi Pueblo Food Center	Retailer	85	Modesto
2012	Emanuel Medical Center	Health Care	24	Turlock
2011	Conifer Revenue Cycle	Call Center	100	Modesto
2011	John B. Sanfilippo & Son	Food Processing	19	Modesto SOI
2011	State Farm Insurance	Insurance	10	Modesto
2011	Buy-Rite Thrift Store	Retailer	75	Modesto
2011	Raley's	Retailer	60	Ceres
2011	Valley Heart Associates	Health Care	58	Modesto
2010	Angelica Textile Services	Laundry Services	211	Turlock
2010	First Transit	Transportation	120	Modesto
2010	Kindred Hospital	Hospital	127	Modesto
2010	Stellar Relay	Call Center	147	Salida
2010	Trim Masters	Automotive Parts	186	Modesto SOI
2010	NI Industries	Ammunition Plant	15	Riverbank
2010	Valley Fresh, Inc	Poultry Processing	163	Turlock
2010	Xanodyne Pharmaceuticals	Drugs	1	Modesto
2009	Mervyn's LLC	Retailer	89	Turlock
2009	Circuit City Stores	Retailer	53	Modesto
2009	Crossmark Home Improvement Services	Merchandising Services	10	Modesto

2009	Gottschalks Inc.	Retailer	256	Modesto
2009	Modesto Cal Fruit	Food Processing	77	Modesto
2009	CDG Management/Civic Development Group	Call Center	105	Modesto
2009	NI Industries	Ammunition Plant	33	Riverbank
2009	Servicecraft Logistics LLC	Logistics	21	Modesto SOI
2009	Trim Masters	Automotive Parts	83	Modesto SOI
2009	Varco Pruden Buildings	Metal Buildings	53	Turlock
2009	Gallo Glass	Manufacturing	45	Modesto SOI
2009	County Bank	Bank	30	Modesto
2009	Hazel's Fine Dining	Restaurant	10	Modesto
2009	Modesto Steam Laundry	Cleaning Services	19	Modesto
2009	Blockbuster	DVD Rentals	9	Modesto
2009	Modesto Bee	newspaper	40	Modesto
2009	SaveMart	Supermarket	50	Modesto
2009	Modesto Bee`	newspaper	11	Modesto
2009	Modesto Flight Center	Transportation	10	Modesto
2008	Ace Hardware	Retailer	9	Modesto
2008	PennySaver	Newspaper	7	Modesto
2008	Crescent Jewelers	Jewelery Retailer	9	Modesto
2008	Brawley's RV	RV Sales	5	Modesto
2008	Ethan Allen`	Furniture Store	15	Modesto
2008	Enterprise Rent-A-Car	Car Rentals	8	Modesto
2008	Stanislaus Co. Child Support Services	Govt.	21	Modesto SOI
2008	Curt Hughes Generation Motors	New Cars	50-99	Modesto
2008	CA Fraternal Orer of Police Fundraising	Charity	103	Modesto SOI
2008	Sacramento Bldg Products	Construction Supplies	65	Modesto
2008	Hischier Nursery	Nursery	10	Modesto
2008	Addus Health Care	Health Care & Social Assist	12	Modesto
2008	American Auto Assn	Home & Vehicle Insurance	10	Modesto
2008	Westland Technologies	Rubber Products Mfg	3	Modesto SOI
2008	Skywest Airlines	Air Travel	4	Modesto
2008	Alliance Motor & Transmission	Auto Service Repair	5	Modesto
2008	North American Title Co.	Title Company	5	Modesto
2008	The Yard Lumber & Fence	Building Materials Retailer	20	Modesto SOI
2008	Special Days Bridal & Tuxedo	Bridal Retailer	20	Modesto
2008	Tony Roma's	Restaurant	41	Modesto
2008	Scrambl'z Country Kitchen	Restaurant	20	Modesto
2008	Calvary Temple Academy	Private School	32	Modesto
2008	Stanislaus County Building Permit	Govt	9	Modesto
2008	Wachovia Mortgage	Finance	5	Modesto
2008	Aqua Shi	Restaurant	10	Modesto
2008	Stanislaus County Library	Library	94	Countywide
2008	Compass Maps	Cartography	17	Modesto
2008	Michotti's Marketplace	Supermarket	25	Modesto
2008	Kraft Foods	Kool-Aid	65	Modesto
2008	Hammetts Womens Wear	Retailer	5	Modesto
2008	Indalex, Inc.	Extruded Aluminum	139	Modesto SOI
2008	Kindred Hospital	Hospital	75	Modesto
2008	Mervyn's LLC	Retailer	104	Modesto
2008	Patterson Vegetable Company LLC	Food Processing	20	Patterson
2008	People First Rehabilitation	Health Care	2	Modesto
2008	Richland Markets	Retailer	60	Modesto
2008	Linens 'n Things	Retailer	25	Modesto
2008	Stellar Nordia	Call Center	237	Riverbank
2008	Modesto Bee	Newspaper	172	Modesto
2007	Lactalis USA	Cheese Mfg	94	Turlock

2007	Patterson Frozen Foods	Frozen Food Processing	633	Patterson
2007	US Postal Service	Encoding Services Center	350	Modesto
2007	CompUSA	Computers	35	Modesto
2007	Levitz	Furniture Store	10	Modesto
2007	Mallard's	Restaurant	51	Modesto
2007	IHOP	Restaurant	38	Modesto
2007	Acapulco Restaurant	Restaurant	35	Modesto
2007	National City Mortgage	Home Loans	8	Modesto
2007	DeltaTRAK	Scientific Instrumentation	4	Modesto
2007	Planet Mitsubishi	Car Dealership	17	Modesto
2007	Owens Corning Homexperts	Home Finishers	35	Modesto SOI
2007	Hershey Co. (Total layoff number)	Candy Mfg	575	Oakdale
2007	Graham Packaging	Packaging	25	Oakdale
2007	Plyco	Vent Mfg	33	Waterford
2007	Alliance Title Co.	Title Company	30	Countywide
2006	Valley Fresh, Inc	Poultry Processing	200	Turlock
2006	California Fruit & Tomato Kitchen	Food Processing	200	Riverbank
2006	Signature Fruit, LLC	Food Processing	1,190	Modesto SOI
2006	Modesto Disposal Service	Waste Management	64	Modesto SOI
2006	Copeland Sports	Sporting Goods	49	Modesto
2006	Doctors Medical Center	Hospital	40	Modesto
2006	Northrup Grumman Technical Services, Inc. (U	Manufacturing	9	Modesto SOI
2005	Richland Markets	Retailer	50	Modesto
2005	Doctors Medical Center	Hospital	75	Modesto
2005	Modesto Tallow Co.	Tallow/Rendering	65	Modesto

Note - these lists are a partial view of some major expansions and downsizings in Stanislaus. They are not comprehensive.
Information is from a variety of sources, including WARN Notices and press reports. May reflect midpoint of estimates.

APPENDIX B

Stanislaus Expansions 2005-2016		Total	6957	
Year	**Company**	**Product/Service**	**Job (+)**	**City**
2016	Stanislaus County	New Jail	32+	Modesto
2016	Flying J	Retailer	100	Patterson
2016	Amazon	Fulfillment Center	TBD	Patterson
2016	Don's RV	Retailer	TBD	Turlock
2016	Repsco	Plastic Slip Sheets	15	Riverbank
2016	Valley Milk	Dairy	TBD	Turlock
2016	E&J Gallo Winery	Winery	TBD	Modesto
2016	Oportun	Information Technology	25	Modesto
2015	Togo's	Restaurant	14	Oakdale
2015	Dollar General	Retailer	7	Oakdale
2015	Weinerschnitzel	Restaurant	TBD	Oakdale
2015	River Journey Adventures	Recreation	10	Oakdale
2015	Oakdale Kids Dentist	Dentist	3	Oakdale
2015	Bloomingcamp Ranch	Recreation	5	Oakdale
2015	Daily Harvest	Fullfillment Center	TBD	Modesto SOI
2015	Restoration Hardware	Distribution Center	400	Patterson
2015	CalCentral	Manufacturer	38	Modesto SOI
2015	dd's Discounts	Retailer	60	Turlock
2015	Grocery Outlet	Retailer	30	Turlock
2015	Dollar Tree	Retailer	20	Turlock
2015	Planet Fitness	Fitness Center	25	Turlock
2015	Buffalo Wild Wings	Restaurant	80	Turlock
2014	Pete's Joe & Snow	Restaurant	5	Oakdale
2014	Golden State Inspections	Home Services	4	Oakdale
2014	Wendy's	Restaurant	28	Oakdale
2014	Donaldson	Manufacturer	5	Riverbank
2014	Dick's Sporting Goods	Retailer	60	Turlock
2014	JoAnn Fabrics	Retailer	40	Turlock
2014	Hilmar Cheese	Powdered Milk	40	Turlock
2014	Blue Diamond	Almond Producer	200	Turlock
2014	Justice	Retailer	25	Turlock
2014	Maurice's	Retailer	25	Turlock
2014	Sprint	Retailer	30	Turlock
2014	Tilly's	Retailer	25	Turlock
2013	Blue Diamond	Almond Producer	100	Turlock
2013	Amazon	Fullfillment Center	350	Patterson
2013	Wal-Mart Supercenter	Retailer	320	Patterson
2013	Wal-Mart Neighborhood Market	Retailer	95	Turlock
2013	Central Valley Specialty Hospital	Healthcare	150	Modesto
2013	HealthSouth	Healthcare	100	Modesto
2013	Dollar General	Retailer	20	Ceres
2013	Pacific Southwest Container	Packaging Manufacturer	12	Modesto SOI
2013	Flower's Foods	Bakery	100	Modesto SOI
2013	Dollar General	Retailer	6	Newman
2013	AM2T	Metal Manufacturer	15	Riverbank
2013	AQH	Data Services	6	Riverbank
2013	Green Eyes Manufacturing	Recycled Plastic Lumber	5	Riverbank
2013	Intuitive Motion	Skateboard Manufacturer	5	Riverbank
2013	NxStage Security	Metal Door Manufacturer	5	Riverbank
2013	Dollar General	Retailer	6	Turlock
2013	InShape	Fitness Center	35	Turlock
2013	SDLG/Volvo	Equipment Dealer	4	Turlock
2012	Olive Garden	Restaurant	185	Turlock
2012	Ring Container Technologies	Plastic Container Mfg	24	Modesto

2012	Wal-Mart Neighborhood Market	Retailer	80	Modesto
2012	Grocery Outlet Bargain	Retailer	38	Oakdale
2012	Repsco	Plastic Pallets	10	Riverbank
2012	Duarte Nursery	Nursery	40	Hughson
2011	Maxx Value Foods	Retailer	35	Modesto
2011	Greens Market	Retailer	35	Modesto
2011	T3-Direct	Call Center	60	Modesto
2011	Dick's Sporting Goods	Retailer	60	Modesto
2011	Prime Shine	Car Wash	10	Modesto
2011	AE Biofuels	Ethanol Production	50	Keyes
2011	Sunflower Farmers Market (now Sprout's)	Retailer	80	Modesto
2011	Ross Dress For Less	Retailer	40	Modesto
2011	Golden Corral	Restaurant	150	Modesto
2011	Paleteria La Michoacana	Ice Cream	25	Modesto
2011	Aarons	Retailer	TBD	Oakdale
2011	U.S. Cold Storage	Refrigerated Storage/Distribution	15	Turlock
2011	Hobby Lobby	Retailer	35	Modesto
2011	W.W. Grainger	Distribution Center	150	Patterson
2010	Buffalo Wild Wings	Restaurant	160	Modesto
2010	Save Mart Supermarkets	Retailer	10	Modesto
2010	Walgreen's	Pharmacy	TBD	Oakdale
2009	Dawn Foods	Food Processing	100	Modesto SOI
2009	H&M	Retailer	50	Modesto
2009	Goodwill	Retailer	18	Modesto
2009	Kaiser Permanente	Hospital	650	Modesto
2009	99 Cents Only Store	Retailer	50	Modesto
2009	Forever 21	Retailer	150	Modesto
2008	HPL Contract	Furniture Manufacturer	50	Patterson
2008	Westfalia Separator	Biotechnology Equipment	50	Patterson
2008	Sconza Candy Company	Candy Maker	130	Oakdale
2008	Coach/Coldwater Creek	Retailer	300	Modesto
2008	Cost Less Food Co.	Supermarket	75	Modesto
2008	Fresh & Easy Neighborhood Market	Supermarket	TBD	Modesto
2008	Absopure-Div of Plastipak	Bottled Water	10	Modesto SOI
2008	Premier Bakers	Hot Dog/Buns Bakers	10	Modesto SOI
2008	CVS	Pharmacy	20	Modesto
2008	JEOL Ltd.	Mass Spectrometers	5	Modesto SOI
2008	Wal Mart Supercenter	Retailer	350	Modesto
2008	CarMax	Retailer	90	Modesto
2008	SunOpta	Food Processing	100	Modesto SOI
2007	Patterson Vegetable Company	Food Processing	650	Patterson
2007	Uno Chicago Grill	Restaurant	140	Modesto
2007	Raley's	Retailer	125	Modesto
2007	Choice Lighting Co.	Retailer	7	Modesto
2007	Fuddrucker's	Restaurant	15	Modesto
2007	Foster Farms Dairy	Food Processing	35	Modesto
2007	Royal Robbins	Clothing	50	Modesto
2007	Fiscalini Cheese Co.	Food Processing	10	Modesto SOI
2007	5.11 Tacktical	Clothing Manufacturer	249	Modesto SOI
2007	Save Mart Supermarkets	Retailer	90	Riverbank
2007	Dairy Farmers of America	Dairy Products	7	Hughson
2007	Tractor Supply	Retailer	TBD	Oakdale
2006	Home Depot	Retailer	175	Riverbank
2006	Longs Drug	Distribution Center	470	Patterson
2006	Fastenal	Distribution Center	150	Modesto SOI
2006	Grocery Outlet	Retailer	49	Modesto
2006	Just Tomatoes, Etc	Food Processing	75	Westley
2006	Plastipak Packaging	Plastic Container Mfg	50	Modesto SOI
2006	Kohls	Distribution Center	104	Patterson

2005	Food 4 Less	Retailer	125	Ceres
2005	Piranha Produce	Distribution Center	100	Keyes
2005	American Medical Response, Inc.	Emergency Response	120	Modesto SOI
2005	Home Depot, Inc.	Retailer	200	Ceres
2005	Kohl's Corp.	Distribution Center	100	Patterson
2005	Target	Retailer	200	Riverbank
Information is from a variety of sources, including estimates, press reports and averages. May reflect midpoint of estimates.				

APPENDIX C

StanCOG 2016 Regional Transportation Plan

Tier I ROADWAY Projects

Project Details						Purpose/Need				
Location	**Project Limits**	**Description**	**Total Cost**	**Construction Year**	**Funding Source**	**System Preserv.**	**Capacity Enhance.**	**Safety**	**Oper.**	**Alt. Mode**
Regional Projects										
SR-132	SR-132 Connectivity to SR-99	Construct a 4 lane expressway from SR-99 to Dakota Ave. Construct full I/C at SR-132W & SR-99, including improved intersections on SR-132/E/D St., construct extensions of 5th and 6th St. couplets (Maze Blvd to SR-132E/D, and construct a full SR-132 E I/C).	$335,009,300	2028	Local, STIP, IIP, Demo		x		x	
SR-99	Keyes Rd to Taylor Rd	Construct Auxiliary Lane	$6,226,600	2025	STIP, IIP, RSTP, CMAQ				x	
SR-99	Taylor Rd to Monte Vista Ave	Construct Auxiliary Lane	$6,520,300	2025	STIP, IIP, RSTP, CMAQ				x	
SR-99	Monte Vista Ave to Fulkerth Rd	Construct Auxiliary Lane	$6,461,600	2025	STIP, IIP, RSTP, CMAQ				x	
SR-99	Fulkerth Rd to West Main Ave	Construct Auxiliary Lane	$6,402,900	2025	STIP, IIP, RSTP, CMAQ				x	
SR-99	San Joaquin County Line to Mitchell Rd	Install Ramp Metering Improvements including Intelligent Transportation Systems (ITS)	$15,758,300	2028	STIP, IIP, RSTP, CMAQ				x	
SR-99	Mitchell Rd to Merced County Line	Install Ramp Metering Improvements including Intelligent Transportation Systems (ITS)	$3,097,400	2033	STIP, IIP, RSTP, CMAQ				x	
		Total Regional (Roadways)	**$379,476,400**							
City of Ceres										
Various Locations	ITS Signal Synchronization	Install fiber optic and signal interconnect cables and associated conduit. Install of CCTV Cameras.	$533,600	2015	CMAQ				x	
Morgan Rd and Central Ave	(Morgan/Aristocrat & Central/Pine/Industrial)	Construct Roundabouts and Intersection Reconfiguration	$67,700	2016	CMAQ			x	x	
Whitmore Ave.	Whitmore and Morgan Intersection Improvements	Intersection improvements	$437,100	2016	PFF/CMAQ			x	x	
Various Locations	ITS Signal Synchronization, Phase II	Install fiber optic and signal interconnect cables and associated conduit.	$583,000	2017	CMAQ				x	
Various Locations	Traffic Signal Synchronaiztion Improvements	Improvements to the City's traffic signal system along the main corridor.	$427,600	2017	CMAQ			x	x	
Morgan Rd	Service Rd & Morgan Rd	Install Traffic Signal	$347,800	2018	PFF/CMAQ			x	x	
Crows Landing Rd	New Industrial St	Install Traffic Signal	$262,200	2020	PFF			x	x	
SR-99	Mitchell Rd/Service Rd	Construct New Interchange - Phase I	$122,987,400	2020	PFF / RSTP/ Other		x			
Morgan Rd	7th St to Grayson Rd	Widen from 2 to 4 lanes	$938,700	2020	PFF		x			
Whitmore Ave	Mitchell Rd to Faith Home	Widen from 2 to 4 lanes	$1,072,500	2020	PFF		x			
Crows Landing Rd	Crows Landing Rd & A Street	Install Traffic Signal	$430,500	2020	WLSP/PFF			x	x	
Whitmore Ave	Ustick Rd to Blaker Rd	Widen from 2 to 4 lanes	$1,621,200	2022	PFF		x			
Grayson Rd	Grayson Rd & Morgan Rd	Install Traffic Signal	$1,075,200	2023	CMAQ, PFF			x	x	
Hatch Rd	Hatch Rd & Faith Home Rd	Install Traffic Signal	$484,500	2024	CMAQ, PFF			x	x	
Central Ave	Hatch Rd to Grayson Rd	Widen from 2 to 4 lanes	$8,361,100	2025	PFF		x			
Mitchell Rd	River Rd to Service Rd	Widen to 6 lanes	$9,146,800	2025	PFF		x			
Crows Landing Rd	Crows Landing Rd & Grayson Rd	Install Traffic Signal	$499,100	2025	CMAQ, PFF			x	x	
Service Road	Service Road & Ustick	Install Traffic Signal	$499,100	2025	WLSP/PFF			x	x	
Roeding Rd	Roeding Rd & Faith Home Rd	Install Traffic Signal	$499,100	2025	CMAQ, PFF			x	x	
Whitmore Ave	Whitmore Ave. @ E Street	Install Traffic Signal	$499,100	2025	WLSP/PFF			x	x	
Whitmore Ave	Whitmore Ave & Boothe Rd	Install Traffic Signal	$514,000	2026	CMAQ, PFF			x	x	
Whitmore Ave	Whitmore Ave. @ Knox Rd	Install Traffic Signal	$545,300	2028	WLSP/PFF			x	x	
Central Ave	Redwood Rd & Central Ave and Grayson Rd & Central Ave	Install Traffic Signals	$1,268,400	2030	PFF			x	x	
Hatch Rd	Herndon Rd to Faith Home Rd	Install Complete Street Improvements	$27,086,200	2030	PFF		x	x		
Service Rd	Ustick Rd to Central Rd	Install Complete Street Improvements	$34,650,200	2030	PFF		x	x		
Crows Landing Rd	Crows Landing Rd & B Street	Install Traffic Signal	$578,500	2030	WLSP/PFF			x	x	
Ustick Rd	Ustick Rd & F Street	Install Traffic Signal	$578,500	2030	WLSP/PFF			x	x	
Whitmore Ave	Whitmore Ave. and Ustick Rd	Install Traffic Signal	$578,500	2030	WLSP/PFF			x	x	
Various Locations	Various Locations	Signal & ITS Improvements	$3,353,200	2035	CMAQ			x	x	
Various Locations	Various Locations	Reconstruct Major Streets (Annual Basis)	$19,175,400	2035	RSTP	x				
Crows Landing Rd	Service Rd to Grayson Rd	Widen from 2 to 4 lanes	$2,980,100	2035	PFF		x			
Ustick Rd	Ustick Rd & C Street	Install Traffic Signal	$670,700	2035	WLSP/PFF			x	x	
Whitmore Ave	Whitmore Ave & Faith Home Rd	Install Traffic Signal	$670,700	2035	CMAQ, PFF			x	x	
Ustick Rd	Ustick Rd & G Street	Install Traffic Signal	$777,500	2040	WLSP/PFF			x	x	
Grayson Rd	Ustick Rd to Central Ave	Widen from 2 to 4 lanes	$2,889,600	2040	PFF		x			
		Total City of Ceres (Roadways)	**$247,090,100**							
City of Hughson										
Various Locations	Various Locations	Various Intersection Improvements	$39,000	2015 - 2035	RSTP, CMAQ			x	x	
Locust St	Orchard Lane to Euclid Ave	Add 2nd lane to a 2-lane Minor Collector	$424,200	2024	RSTP, Dev. Impact Fees		x			
7th St	Whitmore Ave to Santa Fe Ave	Improve to 2-lane Major Collector	$2,288,100	2030	RSTP, Dev. Impact Fees		x			
Tully Rd	Santa Fe Ave to Whitmore Ave	Improvements to 2-lane Arterial	$425,300	2014	RSTP		x			
Santa Fe	7th Street to Hatch Road	Roadway Rehabilitation	$479,700	2019	RSTP, Prop. 42	x				

APPENDIX C

Project Details						Purpose/Need				
Location	**Project Limits**	**Description**	**Total Cost**	**Construction Year**	**Funding Source**	**System Preserv.**	**Capacity Enhance.**	**Safety**	**Oper.**	**Alt. Mode**
Euclid Ave	Hatch Rd to Whitmore Ave	Install Complete Street Improvements	$2,630,400	2022	Dev. Impact Fees		x	x		
Various Locations	Various Locations	Roadway Rehabilitation	$242,400	2015-2035	RSTP	x				
		Total City of Hughson (Roadway)	**$6,529,100**							
City of Modesto										
SR-132 West	State Route 99 to Dakota Ave	Construct a new 4 lane expressway from SR-99 to Dakota Ave (Phase 1A of the SR-132 Connectivity to SR-99 Project- Reference: 2014 RTP Project ID - RE 01).	$59,084,900	2018	STIP, CFF, RSTP		x			
SR-99	Kiernan Avenue (SR-219) to SR-132	Widen from 6 to 8 lanes	$50,670,900	2020	STIP, PFF, IIP		X			
10th and J Streets	10th & J St. Corridor	Pedestrian & Bike Enhancements	$3,167,000	2020	CMAQ					x
Briggsmore Ave	Tully Rd to Oakdale Rd	Widen from 4 to 6 lanes	$31,669,300	2020	CFF		x			
Brink Rd	Paralleling SR-99 to Murphy Rd & Carpenter	Install Complete Street Improvements	$15,201,300	2020	CFF, DEVELOPER		x	x		x
Carpenter Rd	Paradise Rd to Maze Blvd (SR-132) (Priority #1)	Install Complete Street Improvements	$19,001,600	2020	CMAQ, CFF		x	x		x
Claratina Ave	McHenry Ave to Coffee Rd	Widen from 2 to 6-lane Expressway	$16,391,000	2015	RSTP, CFF		x			
Crows Landing Rd	SR-99 to 7th St	Widen from 2 to 4 lanes	$7,342,700	2025	RSTP, CFF		x			
Dale Rd	Pelandale Ave to Kiernan Ave	Widen from 4 to 6 lanes	$7,600,700	2020	RSTP, CFD		x			
Dale Rd	Pelandale Ave to Standiford Ave	Widen from 4 to 6 lanes	$3,800,400	2020	RSTP		x			
Hwy 132	SR 99 to 9th Street	Various improvements	$6,333,900	2020	STIP	x				
Oakdale Rd	Sylvan Ave to Claratina Ave	Widen from 2 to 6 lanes	$7,600,700	2020	RSTP, CFF		x			
Roselle Ave	Sylvan Ave to Claratina Rd	Widen from 2 to 4 lanes	$8,867,400	2020	RSTP, CFF		x			
Scenic Avenue	Coffee to Bodem	Safety Improvements	$2,533,600	2020	RSTP			x		
SR-99	SR-99 & Briggsmore Interchange	PE and ROW *(reconstruction to 8-lane Interchange)*	$12,667,800	2020	STIP		x			
SR-99	SR-99 & Briggsmore Interchange	Reconstruct to 8-lane Interchange	$98,679,400	2035	STIP		x			
SR-99	SR-99 & Pelandale Interchange	Reconstruct to 8-lane Interchange - Phase II	$5,835,000	2014	STIP, CFF					
Various Locations	Various Locations	Roadway Rehabilitation	$130,405,800	2014-2040	RSTP	x				
Various Locations	Various Locations	Various intersection Improvements	$52,164,000	2014-2040	CMAQ			x	x	
		Total City of Modesto (Roadway)	**$539,017,400**							
City of Newman										
SR-33	Yolo St to Sherman Pkwy	Install 4 Lane Arterial Roadway Improvements	$4,753,100	2017	CFF, LTF, CMAQ, RSTP, Local		x			
SR-33	Sherman Pkwy to Stuhr Road	Install 4 Lane Arterial Roadway Improvements	$4,298,600	2018	CFF, LTF, CMAQ, RSTP, Local		x			
Stuhr Road	CCID Canal to Highway 33	Install 4 Lane Arterial Roadway Improvements	$8,117,200	2019	CFF, LTF, CMAQ, RSTP, Local		x			
SR-33	Yolo Avenue to Inyo Avenue	Install 4 Lane Arterial Roadway Improvements	$3,689,700	2019	CFF, LTF, CMAQ, RSTP, Local		x			
Various Locations	Various Locations	Traffic flow and roadway improvements	$2,459,800	2019	CFF, LTF, CMAQ, RSTP, Local			x	x	
Inyo Ave	Highway 33 to Canal School Rd	Install Collector Street improvements	$7,751,800	2023	CFF, LTF, CMAQ, RSTP, Local		x	x		
Merced Avenue	Highway 33 to Canal School Rd	Install Collector Street improvements	$3,965,100	2025	CFF, LTF, CMAQ, RSTP, Local		x	x		
		Total City of Newman (Roadway)	**$35,035,300**							
City of Oakdale										
D St	Rodeo to Stearns Rd	Install Complete Street Improvements	$3,582,200	2018	CFF		x	x		
F St	Maag Ave to Stearns Rd	Widen Roadway to 5-lanes	$4,152,800	2023	CFF, RSTP, Developer		x			
J St	Orsi Road to Stearns Road	Install Complete Street Improvements	$3,460,600	2023	CFF, Developer		x	x		
Crane Road	North Crane to F St	Widen Roadway to 4-lanes	$8,997,600	2023	CFF, Developer		x			
Orsi Rd	Sierra Rd to F St	Install Complete Street Improvements	$3,460,600	2023	CFF, Developer		x	x		
Orsi Rd	Orsi Road and J St	Install Traffic Signal	$692,200	2023	CFF, Developer			x	x	
Second Avenue	D Street to E Street	Roadway Rehabilitation	$546,400	2015	RSTP, CMAQ, Grants	x				
Sierra Rd	5th St to Stearns Rd	Widen Roadways to 4-lanes	$4,844,900	2023	CFF, RSTP		x			
South Yosemite Avenue	H Street to J Street	Widen northbound roadway to 2-lane road	$819,600	2015	RSTP, CMAQ, LTF		x			
Stearns Rd	A St to F St	Widen Roadway to 4-lanes	$2,076,400	2023	CFF, Developer		x			
Stearns Rd	F St to Sierra Rd	Widen Roadway to 4-lanes	$2,768,500	2023	CFF, Developer		x			
Various Locations	Various Locations	Install Traffic Signals and Various Intersection Improvements	$1,957,200	2018-2023	CMAQ			x	x	
Various Locations	Various Locations	Roadway Rehabilitation	$1,957,200	2018-2023	RSTP, CMAQ, Prop 42	x				
		Total City of Oakdale (Roadway)	**$39,316,200**							
City of Patterson										
Sperry Ave	Ward Ave to Rogers Road	Widen to 4-lanes	$11,255,100	2016	Dev. Fees, RSTP		x			

APPENDIX C

Project Details						Purpose/Need				
Location	Project Limits	Description	Total Cost	Construction Year	Funding Source	System Preserv.	Capacity Enhance.	Safety	Oper.	Alt. Mode
Sperry Ave Interchange	I-5 to Rogers Road	Signal and Off-Ramp Improvements at interchange. Widen Sperry Ave to 4 Lanes between Rogers Road and I-5.	$17,505,100	2017	Dev. Fees, STIP, CMAQ, Local		x		x	
Sperry Ave	Ward Ave to SR-33	Install Complete Street Improvements	$7,379,300	2019	Dev. Fees, RSTP		x	x		
Various Locations	Various Locations	Install Traffic Signals	$17,008,800	2014-2030	Dev. Fees, CMAQ			x	x	
Various Locations	Various Locations	Roadway Rehabilitation	$5,510,100	2014-2030	RSTP, CMAQ	x			x	
		Total City of Patterson (Roadway)	$58,658,400							
City of Riverbank										
Various Locations	Various Locations	Roadway Rehabilitation	$2,694,200	2014 - 2023	RSTP, LTF, Gas Tax	x				
Pavement Management: Prevntative Maintenance	Various Locations	Roadway Rehabilitation	$14,469,900	2014-2038	RSTP, LTF	x				
SR-108	Jackson to BNSF Tracks	Widen roadway from 2-4 lanes	$4,845,600	2023	RSTP, Dev. Fees/Traffic Impact Fees		x			
Patterson	Roselle Ave to Claus Rd	Install Complete Street Improvements	$6,844,500	2029	RSTP, Dev. Fees/Traffic Impact Fees		x	x		
Roselle Avenue	Patterson to Claribel	Install Complete Street Improvements	$4,311,400	2033	Dev. Fees/Traffic Impact Fees		x	x		
Claus Road	California to Claribel	Widen roadway from 2-4 lanes	$1,895,700	2020	Dev. Fees/Traffic Impact Fees		x			
Claribel Rd	Claribel at Roselle	Signal improvements	$162,200	2014	CMAQ			x	x	
Patterson Rd	Patterson at Roselle	Signal improvements with pedestrian crossings and sidewalks	$1,307,000	2015	CMAQ			x	x	
Santa Fe Rd	Calendar at Santa Fe	Signal improvements	$742,700	2014	CMAQ			x	x	
Patterson Rd	Patterson at Third	Signal improvements	$450,300	2016	CMAQ			x	x	
Claus Road	Claus at California	Signal improvements	$652,400	2021	CMAQ			x	x	
Patterson Rd	Patterson at Eighth	Signal improvements	$403,200	2022	CMAQ			x	x	
Patterson Rd	Patterson at First	Signal improvements	$933,500	2023	CMAQ			x	x	
Claus Rd	SR-108 at Claus	Signal improvements	$1,688,300	2016	CMAQ			x	x	
Patterson Rd	Patterson at First	Railroad crossing improvements	$396,600	2025	Dev. Fees/Traffic Impact Fees			x	x	
Patterson Rd	Patterson at Third	Railroad crossing improvements	$286,500	2014	Dev. Fees/Traffic Impact Fees			x	x	
Patterson Rd	Patterson at Eighth	Railroad crossing improvements	$303,900	2016	Dev. Fees/Traffic Impact Fees			x	x	
Patterson Rd	Patterson at Snedigar	Railroad crossing improvements	$273,500	2016	Dev. Fees/Traffic Impact Fees			x	x	
Patterson Rd	Patterson at Terminal	Railroad crossing improvements	$307,900	2020	Dev. Fees/Traffic Impact Fees			x	x	
Santa Fe Rd	First at Santa Fe	Install roundabout	$346,100	2023	CMAQ			x	x	
SR-108	SR-108 at First Street	Install Congestion Management improvements	$2,512,700	2021	CMAQ				x	
		Total City of Riverbank (Roadway)	$45,828,100							
City of Turlock										
SR-99	SR-99 & Fulkerth Rd	Reconstruct Interchange	$12,667,800	2020	CMAQ, Dev. Fees, RSTP, STIP	x	x			
Fulkerth Rd	Tegner Rd to Dianne Dr	Widen from 2-lane to 4-lane Arterial with Class II bike facility and transit	$580,400	2018	Dev. Fees, RSTP		x			
Monte Vista Ave	Olive Ave to Berkeley Ave	Install Median; Add one (1) lane with Class II bike facility	$1,317,500	2020	Dev. Fees, RSTP		x		x	
Fulkerth Rd	Washington Rd to Tegner Rd	Widen from 2-lane to 4-lane Arterial with Class II bike facility	$3,419,800	2018	Dev. Fees, RSTP		x			
Washington Rd	Linwood Ave to Fulkerth Rd	Widen from 2-lane to 4-lane Arterial with Class II bike facility and transit	$2,176,400	2025	Dev. Fees, RSTP		x			
Tegner Rd	Linwood Ave to W. Main St	Construct new 2-lane Industrial Collector with Class II bike facility	$434,600	2020	Dev. Fees, RSTP		x			
W. Canal Dr	SR-99 to Tegner Rd	Construct new 2-lane Collector with Class I bike facility	$2,065,400	2016	Dev. Fees, RSTP		x			
N. Olive Ave	Tuolumne Rd to Tornell Rd	Widen from 2-lane to 4-lane Arterial with Class II bike facility	$757,600	2020	Dev. Fees		x			
N. Olive Ave	Canal Dr to Wayside Rd	Widen from 2-lane to 4-lane Arterial with Class II bike facility and transit	$852,600	2020	Dev. Fees		x			
N. Olive Ave	Wayside Dr to North Ave	Widen from 2-lane to 4-lane Arterial with Class II bike facility and transit	$888,100	2020	Dev. Fees		x			
W. Linwood Ave	Walnut Rd to Lander Ave	Widen from 2-lane to 3-lane Collector with Class II bike facility and transit (West Ave. South to Lander)	$615,700	2020	Dev. Fees, RSTP		x			
W. Linwood Ave	Walnut Rd to Washington Rd	Widen from 2-lane to 3-lane Collector with Class II bike facility	$4,207,400	2025	Dev. Fees, RSTP		x			
W. Canal Dr	Washington Rd to Kilroy Rd	Construct new 2-lane Collector with Class I bike facility	$2,507,600	2018	Dev. Fees, RSTP		x			

APPENDIX C

Project Details						Purpose/Need				
Location	**Project Limits**	**Description**	**Total Cost**	**Construction Year**	**Funding Source**	**System Preserv.**	**Capacity Enhance.**	**Safety**	**Oper.**	**Alt. Mode**
East Ave	Golden State Blvd to Daubenberger Rd	Widen from 2-lane to 4-lane Arterial with Class III bike facility from Minaret to S. Berkeley/Class II from S. Berkeley to Daubenberger and transit from Oak to S. Johnson	$5,958,600	2030	Dev. Fees, RSTP		x			
Golden State Blvd	Taylor Rd to Monte Vista Ave	Complete 6-lane Boulevard with Class II bike facility and transit from Christoffersen to Monte Vista	$3,310,100	2020	Dev. Fees, RSTP		x			
Golden State Blvd	Monte Vista Ave to Fulkerth Rd	Complete 6-lane Boulevard with Class II bike facility	$2,869,300	2020	Dev. Fees, RSTP		x			
N. Kilroy Ave	W. Main St to W. Canal Dr	Construct new Collector	$743,100	2025	Dev. Fees, RSTP		x			
Tegner Rd	Monte Vista Ave to Fulkerth Rd	Complete 2-lane Industrial Collector	$674,300	2015	Dev. Fees, RSTP		x			
Tegner Rd	Fulkerth Rd to north of Pedretti Park	Construct new 2-lane Industrial Collector	$995,700	2020	Dev. Fees, RSTP		x			
Taylor Rd	Tegner Rd to Golden State Blvd	Widen from 2-lane to 4-lane Collector with Class II bike facility	$505,500	2020	Dev. Fees, RSTP		x			
S. Kilroy Ave	Spengler Way to W. Linwood Ave	Construct new Industrial Collector	$934,000	2025	Dev. Fees, RSTP		x			
Taylor Rd	Golden State Blvd to SR-99	Widen from 2-lane to 4-lane Arterial with Class II bike facility	$139,600	2025	Dev. Fees, RSTP		x			
Tegner Rd	W. Main St to Fulkerth Rd	Construct new 2-lane Industrial Collector with Class II bike facility	$2,795,800	2020	Dev. Fees, RSTP		x			
Various Locations	Various Locations	Install Traffic Signals and Various Intersection and Synchronization Improvements	$4,105,100	2014 - 2025	CMAQ, Dev. Fees			x	x	
SR-99	Lander Ave (SR-165) to S. City Limits	Construct New Interchange	$35,785,000	2028	CMAQ, Dev. Fees, STIP		x			
SR-99	W. Main St	Construct New Interchange	$19,091,000	2025	CMAQ, Dev. Fees, STIP		x			
SR-99	Taylor Rd	Reconstruct existing Interchange	$7,693,700	2025	CMAQ, Dev. Fees, STIP	x	x			
SR-99	Tuolumne Rd	Construct New Overpass	$9,693,400	2018	CMAQ, Dev. Fees, STIP		x			
Washington Rd	Fulkerth Rd to Monte Vista Ave	Construct 4-lane Expressway with Class II bike facility and transit	$2,674,000	2025	Dev. Fees, RSTP		x			
Golden State Blvd	Golden State Blvd & Taylor Rd	Widen Intersection from 2 to 4 lanes with bike improvements	$2,690,400	2025	Dev. Fees, RSTP		x			
Various Locations	Various Locations	Roadway Rehabilitation	$40,502,000	2014-2040	RSTP	x				
		Total City of Turlock (Roadway)	**$173,651,500**							
City of Waterford										
Various Locations	Various Locations	Traffic Signals, intersection improvements and other transportation enhancements	$4,769,300	2014-2040	CMAQ, RSTP, HSIP			x	x	
Various Locations	Various Locations	Roadway Rehabilitation	$14,158,800	2014-2040	RSTP	x				
		Total City of Waterford (Roadway)	**$18,928,100**							
Stanislaus County										
Various Locations	Various Locations	Roadway Rehabilitation	$65,993,400	2014 - 2040	RSTP	x				
SR-99	SR-99 & Hammett Rd	Interchange Replacement	$95,524,200	2015	STIP, PFF		x			
North County Corridor	Tully Rd to SR 120/108	Construct 2-6 Lane Expressway	$380,031,100	2020	STIP, IIP, PFF		x			
McHenry Ave	McHenry Ave @ Stanislaus River Bridge	Seismic Bridge Replacement	$21,493,000	2015	HBP, PFF	x	x	x		
Crows Landing Rd	Crows Landing Rd. & Grayson Rd	Install Traffic Signal	$2,740,100	2018	CMAQ, PFF			x	x	
Santa Fe Ave & Terminal Ave	BNSF Railroad	Upgrade Railroad Crossings	$656,800	2015	Section 130			x	x	
Geer-Albers	Milnes to Claribel	Widen to 3 lanes	$4,111,900	2022	PFF		x			
McHenry Ave	Ladd Rd to Hogue Rd	Widen to 5 lanes	$5,349,600	2018	STIP, PFF		x			
Crows Landing Rd	San Joaquin River Bridge	Seismic Bridge Replacement - 3-lane Bridge	$17,653,500	2014	HBP/LSSRP, PFF	x	x	x		
Geer Rd	Geer Rd @ Tuolumne River Bridge	Seismic Bridge Retrofit	$1,688,300	2014	HBP/LSSRP	x		x		
Hickman Rd	Hickman Rd @ Tuolumne River	Seismic Bridge Replacement	$20,563,300	2018	HBP/LSSRP	x		x		
Hills Ferry Rd	Hills Ferry Rd @ San Joaquin River	Seismic Bridge Retrofit - Mandatory	$7,800,500	2014	HBP/LSSRP	x		x		
Pete Miller Rd	Pete Miller Rd @ Delta Mendota Canal Bridge	Seismic Bridge Retrofit	$2,049,000	2015	HBP/LSSRP	x		x		
Santa Fe Ave	Santa Fe Ave @ Tuolumne River Bridge	Seismic Bridge Replacement	$27,057,300	2016	HBP/LSSRP, PFF	x	x	x		
Seventh St	Seventh St @ Tuolumne River Bridge	Seismic Bridge Replacement; 4 lane bridge with pedestrian access	$35,666,400	2016	HBP	x	x	x		x
Claribel Rd	Claribel Rd & Coffee Rd	Install Traffic Signal	$2,251,100	2014	CMAQ, PFF			x	x	
Crows Landing Rd	Crows Landing Rd & Keyes Rd	Install Traffic Signal	$2,822,300	2019	CMAQ, PFF			x	x	
Crows Landing Rd	Crows Landing Rd & W. Main St	Install Traffic Signal	$3,462,800	2015	CMAQ, PFF			x	x	
Crows Landing Rd	Crows Landing Rd & Fulkerth Ave	Install Traffic Signal	$2,851,600	2021	PFF			x	x	
Claribel Rd	McHenry Ave to Oakdale Rd	Widen to 5 lanes	$15,875,400	2014	STIP, PFF		x			
Kilburn Rd	Kilburn Rd @ Orestimba Creek Bridge	Replace Bridge (Critical)	$6,292,900	2016	HBP	x		x		
Carpenter Rd	Crows Landing Rd & Carpenter Rd	Install Traffic Signal	$3,251,100	2029	CMAQ, PFF			x	x	
Carpenter Rd	Carpenter Rd & Grayson Rd	Install Traffic Signal	$3,305,700	2026	CMAQ, PFF			x	x	
Carpenter Rd	Carpenter Rd & Hatch Rd	Install Traffic Signal	$1,791,100	2015	CMAQ, PFF			x	x	

APPENDIX C

Project Details						Purpose/Need				
Location	**Project Limits**	**Description**	**Total Cost**	**Construction Year**	**Funding Source**	**System Preserv.**	**Capacity Enhance.**	**Safety**	**Oper.**	**Alt. Mode**
Carpenter Rd	Carpenter Rd & Keyes Rd	Install Traffic Signal	$3,612,300	2029	CMAQ, PFF			x	x	
Carpenter Rd	Carpenter Rd & W. Main St	Install Traffic Signal	$3,359,800	2019	CMAQ, PFF			x	x	
Carpenter Rd	Carpenter Rd & Whitmore Ave	Install Traffic Signal	$2,213,800	2016	CMAQ, PFF			x	x	
Central Ave	W. Main St & Central Ave	Install Traffic Signal	$6,523,900	2018	CMAQ, PFF			x	x	
Claribel Rd	Claribel Rd & Roselle Ave	Install Traffic Signal	$2,251,100	2014	CMAQ, PFF			x	x	
Geer Rd	Geer & Santa Fe	Install Traffic Signal	$3,522,900	2018	CMAQ, PFF			x	x	
Geer Rd	Geer & Whitmore	Install Traffic Signal	$3,262,000	2018	CMAQ, PFF			x	x	
Golden State Blvd	Golden State Blvd & Golf Rd / Berkeley Ave	Intersection Improvements	$2,388,200	2015	CMAQ, PFF			x	x	
Santa Fe Ave	Santa Fe & Hatch Road	Install Traffic Signal; Upgrade Railroad Crossing Equipment	$3,376,600	2014	CMAQ, PFF			x	x	
Santa Fe Ave	Santa Fe Ave & East Ave	Install Traffic Signal	$3,612,300	2029	CMAQ, PFF			x	x	
Santa Fe Ave	Santa Fe Ave & Keyes Rd	Install Traffic Signal; Upgrade Railroad Crossing Equipment	$4,537,800	2023	CMAQ, PFF			x	x	
Santa Fe Ave	Santa Fe Ave & Main St	Install Traffic Signal; Upgrade Railroad Crossing Equipment	$4,405,700	2022	CMAQ, PFF			x	x	
Santa Fe Ave	Santa Fe Ave & Service Rd	Install Traffic Signal; Upgrade Railroad Crossing Equipment	$4,537,800	2023	CMAQ, PFF			x	x	
Faith Home Rd	W. Main St & Faith Home Rd	Install Traffic Signal	$3,176,500	2023	CMAQ, PFF			x	x	
Carpenter Rd	Whitmore Ave to Keyes Rd	Widen to 3 lanes	$5,534,500	2016	PFF		x			
Carpenter Rd	Keyes Rd to Monte Vista Ave	Widen to 3 lanes	$3,783,900	2018	PFF		x			
Carpenter Rd	Monte Vista Ave to W. Main St	Widen to 3 lanes	$3,737,500	2020	PFF		x			
Claus Rd	Terminal Ave to Claribel Rd	Widen to 3 lanes	$2,648,600	2024	PFF		x			
Crows Landing Rd	Keyes Rd to Monte Vista Ave	Widen to 3 lanes	$2,459,800	2016	PFF		x			
Crows Landing Rd	Monte Vista Ave to W. Main St	Widen to 3 lanes	$2,459,800	2016	PFF		x			
Crows Landing Rd	W. Main St to Harding Rd	Widen to 3 lanes	$2,533,600	2017	PFF		x			
Crows Landing Rd	Harding Rd to Carpenter Rd	Widen to 3 lanes	$3,091,100	2019	PFF		x			
Crows Landing Rd	Carpenter Rd to River Rd/ Marshall Rd	Widen to 3 lanes	$1,425,800	2021	PFF		x			
Crows Landing Rd	River Rd/Marshall Rd to SR-33	Widen to 3 lanes	$15,112,300	2024	PFF		x			
Geer-Albers	Taylor Rd to Santa Fe Ave	Widen to 3 lanes	$4,550,600	2016	PFF		x			
Geer-Albers	Santa Fe Ave to Hatch Rd	Widen to 3 lanes	$3,927,000	2017	PFF		x			
Geer-Albers	Hatch Rd to SR-132	Widen to 3 lanes	$3,628,600	2019	PFF		x			
Geer-Albers	SR-132 to Milnes Rd	Widen to 3 lanes	$10,696,400	2028	PFF		x			
McHenry Ave	Hogue Rd to San Joaquin County Line	Widen to 5 lanes	$8,891,600	2014	STIP, PFF		x			
Santa Fe Ave	Keyes Rd to Geer Rd	Widen to 3 lanes	$4,405,700	2022	PFF		x			
Santa Fe Ave	Geer Rd to Hatch Rd	Widen to 3 lanes	$3,116,000	2024	PFF		x			
Santa Fe Ave	Hatch to Tuolumne River	Widen to 3 lanes	$2,809,900	2026	PFF		x			
W. Main St	San Joaquin River to Carpenter Rd	Widen to 3 lanes	$5,398,600	2020	PFF		x			
W. Main St	Carpenter Rd to Crows Landing Rd	Widen to 3 lanes	$3,443,700	2016	PFF		x			
W. Main St	Crows Landing Rd to Mitchell Rd	Widen to 3 lanes	$5,288,500	2016	PFF		x			
W. Main St	Mitchell Rd to Washington Rd	Widen to 3 lanes	$3,783,900	2018	PFF		x			
SR-219	SR-99 to McHenry Ave	Widen to 6-lanes	$41,527,100	2020	STIP		x			
SR-132 West	Dakota to Gates	Construct new 2-lane alignment on existing Right of Way	$55,369,400	2020	STIP		x			
Cooperstown Rd	Cooperstown Road at Gallup Creek	Bridge Replacement - Off System Bridge Toll Credits	$3,249,200	2018	HBP	x		x		
Cooperstown Rd	Cooperstown Road at Rydberg Creek	Bridge Replacement - Off System Bridge Toll Credits	$3,313,000	2018	HBP	x		x		
Crabtree Rd	Crabtree Road at Dry Creek	Bridge Replacement - Off System Bridge Toll Credits	$6,646,800	2017	HBP	x		x		
Gilbert Rd	Gilbert Road at Ceres Main Canal	Bridge Replacement - Off System Bridge Toll Credits	$1,254,200	2017	HBP	x		x		
Pleasant Valley Rd	Pleasant Valley Road at South San Joaquin Main Canal	Bridge Replacement - Off System Bridge Toll Credits	$2,325,200	2018	HBP	x		x		
Shiells Rd	Shiells Road over CCID Main Canal	Bridge Replacement - Off System Bridge Toll Credits	$2,041,000	2018	HBP	x		x		
St. Francis	St. Francis Ave at MID Main Canal	Bridge Replacement - Off System Bridge Toll Credits	$1,722,400	2018	HBP	x		x		
Tegner Rd	Tegner Road at Turlock Irrigation District Lateral #5	Bridge Replacement - Off System Bridge Toll Credits	$2,586,100	2018	HBP	x		x		
Tim Bell Road	Tim Bell Road at Dry Creek	Bridge Replacement - Off System Bridge Toll Credits	$15,482,400	2018	HBP	x		x		
Las Palmas	Las Palmas Ave over San Joaquin River	Bridge Replacement	$24,221,700	2016	HBP	x		x		
Milton Road	Milton Road over Rock Creek Tributary	Bridge Replacement - Off System Bridge Toll Credits	$830,200	2016	HBP	x		x		
Sonora Road	Sonora Road over Martells Creek	Scour Countermeasure	$145,900	2016	HBP	x		x		
Faith Home Rd	Keyes Rd to Faith Home Rd Interchange	Construct new 4-lane Expressway	$18,820,300	2024	PFF		x			
Faith Home Rd	Faith Home Rd Interchange to Service Rd including FHRD overcrossing of SR-99	Construct new 4-lane Expressway	$19,630,400	2024	PFF		x			
Faith Home Rd	Service Rd to Hatch Rd	Construct new 4-lane Expressway	$25,332,600	2024	PFF		x			
Faith Home Rd	Hatch Rd to Garner Viaduct	Construct new 4-lane Expressway	$47,798,500	2024	PFF		x			
Faith Home Rd	Garner Rd to SR-132	Construct new 4-lane Expressway	$12,463,800	2024	PFF		x			
		Total Stanislaus County (Roadways)	**$1,168,550,700**							
		Total Tier I Roadway Costs	***$2,713,501,300***							

APPENDIX C

Project Details						Purpose/Need				
Location	Project Limits	Description	Total Cost	Construction Year	Funding Source	System Preserv.	Capacity Enhance.	Safety	Oper.	Alt. Mode
Regional Planning										
Various Locations	Various Locations	Planning, Programming and Monitoring Activities	$1,420,000	2014-2018	RSTP, STIP, FTA					
		Total Regional (Planning)	**$1,420,000**							

APPENDIX F

Air Quality and Greenhouse Gas Emissions Analysis

Crows Landing_Phase 1
Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	578.00	1000sqft	38.00	578,000.00	0
General Light Industry	6,447.00	1000sqft	370.00	6,447,000.00	0
General Light Industry	2,311.00	1000sqft	152.00	2,311,000.00	0
Refrigerated Warehouse-No Rail	2,889.00	1000sqft	190.00	2,889,000.00	0
Unrefrigerated Warehouse-No Rail	802.00	1000sqft	46.00	802,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Crows Landing_Phase 1 - Stanislaus County, Annual

Project Characteristics -

Land Use - PD

Construction Phase - Assumed infrastructure is all front-loaded

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Assumed trenching phase

Grading - Grading for drainage; site preparation for entire site

Architectural Coating -

Vehicle Trips -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation - Potential Tier 4 mitigation

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	880.00	139.00
tblConstructionPhase	NumDays	12,400.00	1,956.00
tblConstructionPhase	NumDays	1,240.00	196.00
tblConstructionPhase	NumDays	880.00	139.00
tblConstructionPhase	NumDays	480.00	76.00
tblGrading	AcresOfGrading	490.00	40.00
tblGrading	AcresOfGrading	0.00	835.00
tblLandUse	LotAcreage	13.27	38.00
tblLandUse	LotAcreage	53.05	152.00

tblLandUse	LotAcreage	148.00	370.00
tblLandUse	LotAcreage	66.32	190.00
tblLandUse	LotAcreage	18.41	46.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.4770	5.3518	3.3628	6.2900e-003	0.6317	0.2337	0.8654	0.3321	0.2150	0.5471	0.0000	565.1739	565.1739	0.1734	0.0000	569.5085
2020	93.2946	21.2986	18.5392	0.0721	5.0720	0.3745	5.4464	1.4916	0.3494	1.8409	0.0000	6,653.8450	6,653.8450	0.5155	0.0000	6,666.7330
2021	4.0250	35.1419	27.9571	0.1368	7.4884	0.2506	7.7390	2.0329	0.2362	2.2690	0.0000	12,712.8136	12,712.8136	0.8291	0.0000	12,733.5398
2022	3.7115	33.0173	25.6268	0.1336	7.4596	0.2178	7.6774	2.0250	0.2052	2.2303	0.0000	12,416.0491	12,416.0491	0.7882	0.0000	12,435.7549
2023	3.2594	26.3645	23.1160	0.1297	7.4595	0.1534	7.6128	2.0250	0.1439	2.1689	0.0000	12,057.7782	12,057.7782	0.6022	0.0000	12,072.8343
2024	3.0843	26.0984	21.7212	0.1281	7.5167	0.1420	7.6587	2.0405	0.1331	2.1736	0.0000	11,918.0409	11,918.0409	0.5971	0.0000	11,932.9693
2025	2.8963	25.5429	20.2002	0.1251	7.4879	0.1291	7.6170	2.0327	0.1210	2.1537	0.0000	11,644.5809	11,644.5809	0.5850	0.0000	11,659.2046
2026	2.7539	25.2353	18.9098	0.1229	7.4878	0.1275	7.6153	2.0326	0.1195	2.1521	0.0000	11,445.1938	11,445.1938	0.5763	0.0000	11,459.6013
2027	2.6194	24.9362	17.8394	0.1209	7.4877	0.1253	7.6130	2.0326	0.1175	2.1501	0.0000	11,262.2246	11,262.2246	0.5696	0.0000	11,276.4638
2028	0.1427	1.4196	0.9721	6.8500e-003	0.4303	7.0500e-003	0.4374	0.1168	6.6200e-003	0.1234	0.0000	638.1001	638.1001	0.0323	0.0000	638.9068
Maximum	**93.2946**	**35.1419**	**27.9571**	**0.1368**	**7.5167**	**0.3745**	**7.7390**	**2.0405**	**0.3494**	**2.2690**	**0.0000**	**12,712.8136**	**12,712.8136**	**0.8291**	**0.0000**	**12,733.5398**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0872	0.3322	3.3258	6.2900e-003	0.2955	0.0101	0.3056	0.1524	0.0101	0.1625	0.0000	565.1733	565.1733	0.1734	0.0000	569.5078
2020	92.8537	16.5473	18.6997	0.0721	4.4509	0.1126	4.5635	1.2577	0.1073	1.3650	0.0000	6,653.8444	6,653.8444	0.5155	0.0000	6,666.7324
2021	3.8198	33.1587	28.0726	0.1368	7.4884	0.1308	7.6192	2.0329	0.1239	2.1567	0.0000	12,712.8132	12,712.8132	0.8291	0.0000	12,733.5394
2022	3.5323	31.2778	25.7694	0.1336	7.4596	0.1179	7.5775	2.0250	0.1116	2.1366	0.0000	12,416.0488	12,416.0488	0.7882	0.0000	12,435.7545
2023	3.0976	24.7850	23.2741	0.1297	7.4595	0.0677	7.5272	2.0250	0.0636	2.0886	0.0000	12,057.7779	12,057.7779	0.6022	0.0000	12,072.8339
2024	2.9344	24.6300	21.8907	0.1281	7.5167	0.0670	7.5837	2.0405	0.0629	2.1034	0.0000	11,918.0405	11,918.0405	0.5971	0.0000	11,932.9690
2025	2.7607	24.2072	20.3798	0.1251	7.4879	0.0656	7.5535	2.0327	0.0616	2.0943	0.0000	11,644.5805	11,644.5805	0.5850	0.0000	11,659.2043
2026	2.6182	23.8997	19.0893	0.1229	7.4878	0.0639	7.5517	2.0326	0.0601	2.0927	0.0000	11,445.1934	11,445.1934	0.5763	0.0000	11,459.6009
2027	2.4837	23.6005	18.0189	0.1209	7.4877	0.0618	7.5495	2.0326	0.0580	2.0906	0.0000	11,262.2242	11,262.2242	0.5696	0.0000	11,276.4635
2028	0.1349	1.3429	0.9824	6.8500e-003	0.4303	3.4000e-003	0.4337	0.1168	3.2000e-003	0.1200	0.0000	638.1001	638.1001	0.0323	0.0000	638.9068
Maximum	**92.8537**	**33.1587**	**28.0726**	**0.1368**	**7.5167**	**0.1308**	**7.6192**	**2.0405**	**0.1239**	**2.1567**	**0.0000**	**12,712.8132**	**12,712.8132**	**0.8291**	**0.0000**	**12,733.5394**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**1.67**	**9.19**	**-0.71**	**0.00**	**1.64**	**60.20**	**3.35**	**2.56**	**59.81**	**7.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Crows Landing_Phase 1 - Stanislaus County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2019	3-31-2019	1.9106	0.1364
2	4-1-2019	6-30-2019	1.9316	0.1377
3	7-1-2019	9-30-2019	1.9528	0.1392
4	10-1-2019	12-31-2019	0.0265	0.0068
5	1-1-2020	3-31-2020	0.0048	0.0048
6	4-1-2020	6-30-2020	41.8946	39.0706
7	7-1-2020	9-30-2020	52.4780	50.8468
8	10-1-2020	12-31-2020	20.4717	19.7438
9	1-1-2021	3-31-2021	9.7236	9.1845
10	4-1-2021	6-30-2021	9.7168	9.1718
11	7-1-2021	9-30-2021	9.8236	9.2726
12	10-1-2021	12-31-2021	9.9397	9.3886
13	1-1-2022	3-31-2022	9.1479	8.6735
14	4-1-2022	6-30-2022	9.1529	8.6732
15	7-1-2022	9-30-2022	9.2535	8.7685
16	10-1-2022	12-31-2022	9.3512	8.8662
17	1-1-2023	3-31-2023	7.3866	6.9561
18	4-1-2023	6-30-2023	7.4087	6.9733
19	7-1-2023	9-30-2023	7.4901	7.0500
20	10-1-2023	12-31-2023	7.5508	7.1106
21	1-1-2024	3-31-2024	7.2967	6.8952
22	4-1-2024	6-30-2024	7.2408	6.8394
23	7-1-2024	9-30-2024	7.3204	6.9145
24	10-1-2024	12-31-2024	7.3769	6.9710
25	1-1-2025	3-31-2025	7.0557	6.6933
26	4-1-2025	6-30-2025	7.0821	6.7157

27	**7-1-2025**	**9-30-2025**	7.1599	6.7895
28	**10-1-2025**	**12-31-2025**	7.2125	6.8421
29	**1-1-2026**	**3-31-2026**	6.9407	6.5783
30	**4-1-2026**	**6-30-2026**	6.9686	6.6022
31	**7-1-2026**	**9-30-2026**	7.0452	6.6748
32	**10-1-2026**	**12-31-2026**	7.0950	6.7245
33	**1-1-2027**	**3-31-2027**	6.8298	6.4674
34	**4-1-2027**	**6-30-2027**	6.8596	6.4932
35	**7-1-2027**	**9-30-2027**	6.9350	6.5645
36	**10-1-2027**	**12-31-2027**	6.9816	6.6112
37	**1-1-2028**	**3-31-2028**	1.5714	1.4868
		Highest	52.4780	50.8468

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	59.9449	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478
Energy	1.1371	10.3373	8.6833	0.0620		0.7856	0.7856		0.7856	0.7856	0.0000	11,253.3497	11,253.3497	0.2157	0.2063	11,320.2228
Mobile	7.7514	116.8319	86.2959	0.7346	62.5356	0.2472	62.7827	16.7817	0.2318	17.0135	0.0000	68,486.6439	68,486.6439	3.4037	0.0000	68,571.7352
Waste						0.0000	0.0000		0.0000	0.0000	3,017.8666	0.0000	3,017.8666	178.3508	0.0000	7,476.6369
Water						0.0000	0.0000		0.0000	0.0000	945.9119	0.0000	945.9119	97.1542	2.2940	4,058.3858
Total	**68.8333**	**127.1702**	**95.0981**	**0.7966**	**62.5356**	**1.0332**	**63.5688**	**16.7817**	**1.0179**	**17.7996**	**3,963.7785**	**79,740.2264**	**83,704.0049**	**279.1250**	**2.5003**	**91,427.2284**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	59.9449	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478
Energy	1.1371	10.3373	8.6833	0.0620		0.7856	0.7856		0.7856	0.7856	0.0000	11,253.3497	11,253.3497	0.2157	0.2063	11,320.2228
Mobile	7.7514	116.8319	86.2959	0.7346	62.5356	0.2472	62.7827	16.7817	0.2318	17.0135	0.0000	68,486.6439	68,486.6439	3.4037	0.0000	68,571.7352
Waste						0.0000	0.0000		0.0000	0.0000	3,017.8666	0.0000	3,017.8666	178.3508	0.0000	7,476.6369
Water						0.0000	0.0000		0.0000	0.0000	945.9119	0.0000	945.9119	97.1542	2.2940	4,058.3858
Total	**68.8333**	**127.1702**	**95.0981**	**0.7966**	**62.5356**	**1.0332**	**63.5688**	**16.7817**	**1.0179**	**17.7996**	**3,963.7785**	**79,740.2264**	**83,704.0049**	**279.1250**	**2.5003**	**91,427.2284**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Crows Landing_Phase 1 - Stanislaus County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2019	10/1/2019	5	196	
2	Trenching	Trenching	10/2/2019	4/8/2020	5	136	
3	Site Preparation	Site Preparation	4/9/2020	7/23/2020	5	76	
4	Paving	Paving	4/9/2020	10/20/2020	5	139	
5	Architectural Coating	Architectural Coating	4/9/2020	10/20/2020	5	139	
6	Building Construction	Building Construction	7/24/2020	1/21/2028	5	1956	

Acres of Grading (Site Preparation Phase): 835

Acres of Grading (Grading Phase): 40

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,540,500; Non-Residential Outdoor: 6,513,500; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Rubber Tired Dozers	3		247	0.40
Trenching	Tractors/Loaders/Backhoes	4		97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,083.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	5,414.00	2,135.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.6114	0.0000	0.6114	0.3267	0.0000	0.3267	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4644	5.3430	3.2709	6.0800e-003		0.2335	0.2335		0.2148	0.2148	0.0000	545.8729	545.8729	0.1727	0.0000	550.1906
Total	**0.4644**	**5.3430**	**3.2709**	**6.0800e-003**	**0.6114**	**0.2335**	**0.8449**	**0.3267**	**0.2148**	**0.5415**	**0.0000**	**545.8729**	**545.8729**	**0.1727**	**0.0000**	**550.1906**

3.2 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6600e-003	6.7700e-003	0.0708	1.6000e-004	0.0157	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2800e-003	0.0000	14.8644	14.8644	5.2000e-004	0.0000	14.8774
Total	**9.6600e-003**	**6.7700e-003**	**0.0708**	**1.6000e-004**	**0.0157**	**1.2000e-004**	**0.0158**	**4.1600e-003**	**1.1000e-004**	**4.2800e-003**	**0.0000**	**14.8644**	**14.8644**	**5.2000e-004**	**0.0000**	**14.8774**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2751	0.0000	0.2751	0.1470	0.0000	0.1470	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0746	0.3234	3.2339	6.0800e-003		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	545.8723	545.8723	0.1727	0.0000	550.1900
Total	**0.0746**	**0.3234**	**3.2339**	**6.0800e-003**	**0.2751**	**9.9500e-003**	**0.2851**	**0.1470**	**9.9500e-003**	**0.1570**	**0.0000**	**545.8723**	**545.8723**	**0.1727**	**0.0000**	**550.1900**

3.2 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6600e-003	6.7700e-003	0.0708	1.6000e-004	0.0157	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2800e-003	0.0000	14.8644	14.8644	5.2000e-004	0.0000	14.8774
Total	**9.6600e-003**	**6.7700e-003**	**0.0708**	**1.6000e-004**	**0.0157**	**1.2000e-004**	**0.0158**	**4.1600e-003**	**1.1000e-004**	**4.2800e-003**	**0.0000**	**14.8644**	**14.8644**	**5.2000e-004**	**0.0000**	**14.8774**

3.3 Trenching - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Trenching - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8800e-003	2.0200e-003	0.0211	5.0000e-005	4.6700e-003	4.0000e-005	4.7100e-003	1.2400e-003	3.0000e-005	1.2800e-003	0.0000	4.4366	4.4366	1.5000e-004	0.0000	4.4404
Total	**2.8800e-003**	**2.0200e-003**	**0.0211**	**5.0000e-005**	**4.6700e-003**	**4.0000e-005**	**4.7100e-003**	**1.2400e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**4.4366**	**4.4366**	**1.5000e-004**	**0.0000**	**4.4404**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Trenching - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8800e-003	2.0200e-003	0.0211	5.0000e-005	4.6700e-003	4.0000e-005	4.7100e-003	1.2400e-003	3.0000e-005	1.2800e-003	0.0000	4.4366	4.4366	1.5000e-004	0.0000	4.4404
Total	**2.8800e-003**	**2.0200e-003**	**0.0211**	**5.0000e-005**	**4.6700e-003**	**4.0000e-005**	**4.7100e-003**	**1.2400e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**4.4366**	**4.4366**	**1.5000e-004**	**0.0000**	**4.4404**

3.3 Trenching - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Trenching - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.9400e-003	0.0206	5.0000e-005	5.1100e-003	4.0000e-005	5.1400e-003	1.3600e-003	4.0000e-005	1.3900e-003	0.0000	4.6980	4.6980	1.5000e-004	0.0000	4.7016
Total	**2.8700e-003**	**1.9400e-003**	**0.0206**	**5.0000e-005**	**5.1100e-003**	**4.0000e-005**	**5.1400e-003**	**1.3600e-003**	**4.0000e-005**	**1.3900e-003**	**0.0000**	**4.6980**	**4.6980**	**1.5000e-004**	**0.0000**	**4.7016**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Trenching - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8700e-003	1.9400e-003	0.0206	5.0000e-005	5.1100e-003	4.0000e-005	5.1400e-003	1.3600e-003	4.0000e-005	1.3900e-003	0.0000	4.6980	4.6980	1.5000e-004	0.0000	4.7016
Total	**2.8700e-003**	**1.9400e-003**	**0.0206**	**5.0000e-005**	**5.1100e-003**	**4.0000e-005**	**5.1400e-003**	**1.3600e-003**	**4.0000e-005**	**1.3900e-003**	**0.0000**	**4.6980**	**4.6980**	**1.5000e-004**	**0.0000**	**4.7016**

3.4 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1293	0.0000	1.1293	0.4252	0.0000	0.4252	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2780	2.9037	1.2885	2.4200e-003		0.1468	0.1468		0.1350	0.1350	0.0000	212.5996	212.5996	0.0688	0.0000	214.3185
Total	**0.2780**	**2.9037**	**1.2885**	**2.4200e-003**	**1.1293**	**0.1468**	**1.2761**	**0.4252**	**0.1350**	**0.5602**	**0.0000**	**212.5996**	**212.5996**	**0.0688**	**0.0000**	**214.3185**

3.4 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5300e-003	5.7800e-003	0.0611	1.5000e-004	0.0283	1.2000e-004	0.0284	7.2600e-003	1.1000e-004	7.3700e-003	0.0000	13.9689	13.9689	4.4000e-004	0.0000	13.9798
Total	**8.5300e-003**	**5.7800e-003**	**0.0611**	**1.5000e-004**	**0.0283**	**1.2000e-004**	**0.0284**	**7.2600e-003**	**1.1000e-004**	**7.3700e-003**	**0.0000**	**13.9689**	**13.9689**	**4.4000e-004**	**0.0000**	**13.9798**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5082	0.0000	0.5082	0.1913	0.0000	0.1913	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.1283	1.2301	2.4200e-003		3.9500e-003	3.9500e-003		3.9500e-003	3.9500e-003	0.0000	212.5993	212.5993	0.0688	0.0000	214.3183
Total	**0.0296**	**0.1283**	**1.2301**	**2.4200e-003**	**0.5082**	**3.9500e-003**	**0.5121**	**0.1913**	**3.9500e-003**	**0.1953**	**0.0000**	**212.5993**	**212.5993**	**0.0688**	**0.0000**	**214.3183**

3.4 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.5300e-003	5.7800e-003	0.0611	1.5000e-004	0.0283	1.2000e-004	0.0284	7.2600e-003	1.1000e-004	7.3700e-003	0.0000	13.9689	13.9689	4.4000e-004	0.0000	13.9798
Total	**8.5300e-003**	**5.7800e-003**	**0.0611**	**1.5000e-004**	**0.0283**	**1.2000e-004**	**0.0284**	**7.2600e-003**	**1.1000e-004**	**7.3700e-003**	**0.0000**	**13.9689**	**13.9689**	**4.4000e-004**	**0.0000**	**13.9798**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0943	0.9776	1.0183	1.5800e-003		0.0523	0.0523		0.0481	0.0481	0.0000	139.1961	139.1961	0.0450	0.0000	140.3216
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0943**	**0.9776**	**1.0183**	**1.5800e-003**		**0.0523**	**0.0523**		**0.0481**	**0.0481**	**0.0000**	**139.1961**	**139.1961**	**0.0450**	**0.0000**	**140.3216**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6800e-003	3.1700e-003	0.0336	8.0000e-005	8.3300e-003	6.0000e-005	8.3900e-003	2.2100e-003	6.0000e-005	2.2700e-003	0.0000	7.6645	7.6645	2.4000e-004	0.0000	7.6705
Total	**4.6800e-003**	**3.1700e-003**	**0.0336**	**8.0000e-005**	**8.3300e-003**	**6.0000e-005**	**8.3900e-003**	**2.2100e-003**	**6.0000e-005**	**2.2700e-003**	**0.0000**	**7.6645**	**7.6645**	**2.4000e-004**	**0.0000**	**7.6705**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0195	0.0845	1.2021	1.5800e-003		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	139.1960	139.1960	0.0450	0.0000	140.3214
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0195**	**0.0845**	**1.2021**	**1.5800e-003**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**139.1960**	**139.1960**	**0.0450**	**0.0000**	**140.3214**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6800e-003	3.1700e-003	0.0336	8.0000e-005	8.3300e-003	6.0000e-005	8.3900e-003	2.2100e-003	6.0000e-005	2.2700e-003	0.0000	7.6645	7.6645	2.4000e-004	0.0000	7.6705
Total	**4.6800e-003**	**3.1700e-003**	**0.0336**	**8.0000e-005**	**8.3300e-003**	**6.0000e-005**	**8.3900e-003**	**2.2100e-003**	**6.0000e-005**	**2.2700e-003**	**0.0000**	**7.6645**	**7.6645**	**2.4000e-004**	**0.0000**	**7.6705**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	90.5702					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0168	0.1170	0.1273	2.1000e-004		7.7100e-003	7.7100e-003		7.7100e-003	7.7100e-003	0.0000	17.7451	17.7451	1.3700e-003	0.0000	17.7795
Total	**90.5871**	**0.1170**	**0.1273**	**2.1000e-004**		**7.7100e-003**	**7.7100e-003**		**7.7100e-003**	**7.7100e-003**	**0.0000**	**17.7451**	**17.7451**	**1.3700e-003**	**0.0000**	**17.7795**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.3378	0.2291	2.4220	6.1300e-003	0.6014	4.6200e-003	0.6060	0.1599	4.2500e-003	0.1641	0.0000	553.3762	553.3762	0.0173	0.0000	553.8096
Total	**0.3378**	**0.2291**	**2.4220**	**6.1300e-003**	**0.6014**	**4.6200e-003**	**0.6060**	**0.1599**	**4.2500e-003**	**0.1641**	**0.0000**	**553.3762**	**553.3762**	**0.0173**	**0.0000**	**553.8096**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	90.5702					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0700e-003	8.9500e-003	0.1274	2.1000e-004		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	17.7451	17.7451	1.3700e-003	0.0000	17.7794
Total	**90.5723**	**8.9500e-003**	**0.1274**	**2.1000e-004**		**2.8000e-004**	**2.8000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**17.7451**	**17.7451**	**1.3700e-003**	**0.0000**	**17.7794**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.3378	0.2291	2.4220	6.1300e-003	0.6014	4.6200e-003	0.6060	0.1599	4.2500e-003	0.1641	0.0000	553.3762	553.3762	0.0173	0.0000	553.8096
Total	**0.3378**	**0.2291**	**2.4220**	**6.1300e-003**	**0.6014**	**4.6200e-003**	**0.6060**	**0.1599**	**4.2500e-003**	**0.1641**	**0.0000**	**553.3762**	**553.3762**	**0.0173**	**0.0000**	**553.8096**

3.7 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1219	1.1032	0.9688	1.5500e-003		0.0642	0.0642		0.0604	0.0604	0.0000	133.1757	133.1757	0.0325	0.0000	133.9880
Total	**0.1219**	**1.1032**	**0.9688**	**1.5500e-003**		**0.0642**	**0.0642**		**0.0604**	**0.0604**	**0.0000**	**133.1757**	**133.1757**	**0.0325**	**0.0000**	**133.9880**

3.7 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4623	15.0098	2.5819	0.0345	0.8123	0.0795	0.8918	0.2346	0.0761	0.3107	0.0000	3,282.697 5	3,282.697 5	0.2780	0.0000	3,289.647 8
Worker	1.3972	0.9473	10.0172	0.0254	2.4873	0.0191	2.5064	0.6611	0.0176	0.6787	0.0000	2,288.723 5	2,288.723 5	0.0717	0.0000	2,290.516 0
Total	**1.8595**	**15.9571**	**12.5991**	**0.0599**	**3.2996**	**0.0986**	**3.3982**	**0.8957**	**0.0936**	**0.9894**	**0.0000**	**5,571.421 0**	**5,571.421 0**	**0.3497**	**0.0000**	**5,580.163 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0189	0.1285	1.0040	1.5500e-003		2.3500e-003	2.3500e-003		2.3500e-003	2.3500e-003	0.0000	133.1756	133.1756	0.0325	0.0000	133.9878
Total	**0.0189**	**0.1285**	**1.0040**	**1.5500e-003**		**2.3500e-003**	**2.3500e-003**		**2.3500e-003**	**2.3500e-003**	**0.0000**	**133.1756**	**133.1756**	**0.0325**	**0.0000**	**133.9878**

3.7 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4623	15.0098	2.5819	0.0345	0.8123	0.0795	0.8918	0.2346	0.0761	0.3107	0.0000	3,282.6975	3,282.6975	0.2780	0.0000	3,289.6478
Worker	1.3972	0.9473	10.0172	0.0254	2.4873	0.0191	2.5064	0.6611	0.0176	0.6787	0.0000	2,288.7235	2,288.7235	0.0717	0.0000	2,290.5160
Total	**1.8595**	**15.9571**	**12.5991**	**0.0599**	**3.2996**	**0.0986**	**3.3982**	**0.8957**	**0.0936**	**0.9894**	**0.0000**	**5,571.4210**	**5,571.4210**	**0.3497**	**0.0000**	**5,580.1639**

3.7 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

3.7 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8499	30.9509	5.0842	0.0776	1.8434	0.0834	1.9268	0.5324	0.0797	0.6121	0.0000	7,380.300 7	7,380.300 7	0.6100	0.0000	7,395.551 6
Worker	2.9271	1.9161	20.7098	0.0557	5.6450	0.0421	5.6872	1.5005	0.0388	1.5393	0.0000	5,030.226 2	5,030.226 2	0.1461	0.0000	5,033.878 4
Total	**3.7770**	**32.8670**	**25.7940**	**0.1333**	**7.4884**	**0.1255**	**7.6139**	**2.0329**	**0.1185**	**2.1514**	**0.0000**	**12,410.52 69**	**12,410.52 69**	**0.7561**	**0.0000**	**12,429.42 99**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	3.5100e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total	**0.0428**	**0.2916**	**2.2786**	**3.5100e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

3.7 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.8499	30.9509	5.0842	0.0776	1.8434	0.0834	1.9268	0.5324	0.0797	0.6121	0.0000	7,380.300 7	7,380.300 7	0.6100	0.0000	7,395.551 6
Worker	2.9271	1.9161	20.7098	0.0557	5.6450	0.0421	5.6872	1.5005	0.0388	1.5393	0.0000	5,030.226 2	5,030.226 2	0.1461	0.0000	5,033.878 4
Total	**3.7770**	**32.8670**	**25.7940**	**0.1333**	**7.4884**	**0.1255**	**7.6139**	**2.0329**	**0.1185**	**2.1514**	**0.0000**	**12,410.52 69**	**12,410.52 69**	**0.7561**	**0.0000**	**12,429.42 99**

3.7 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

3.7 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7879	29.2816	4.6863	0.0766	1.8362	0.0720	1.9082	0.5303	0.0689	0.5992	0.0000	7,282.447 6	7,282.447 6	0.5859	0.0000	7,297.095 9
Worker	2.7018	1.7057	18.8133	0.0535	5.6234	0.0406	5.6640	1.4947	0.0374	1.5321	0.0000	4,832.358 7	4,832.358 7	0.1301	0.0000	4,835.611 9
Total	**3.4897**	**30.9873**	**23.4996**	**0.1301**	**7.4596**	**0.1126**	**7.5722**	**2.0250**	**0.1063**	**2.1313**	**0.0000**	**12,114.80 63**	**12,114.80 63**	**0.7161**	**0.0000**	**12,132.70 78**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	3.5000e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.0426**	**0.2905**	**2.2698**	**3.5000e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

3.7 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.7879	29.2816	4.6863	0.0766	1.8362	0.0720	1.9082	0.5303	0.0689	0.5992	0.0000	7,282.4476	7,282.4476	0.5859	0.0000	7,297.0959
Worker	2.7018	1.7057	18.8133	0.0535	5.6234	0.0406	5.6640	1.4947	0.0374	1.5321	0.0000	4,832.3587	4,832.3587	0.1301	0.0000	4,835.6119
Total	**3.4897**	**30.9873**	**23.4996**	**0.1301**	**7.4596**	**0.1126**	**7.5722**	**2.0250**	**0.1063**	**2.1313**	**0.0000**	**12,114.8063**	**12,114.8063**	**0.7161**	**0.0000**	**12,132.7078**

3.7 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3462	301.3462	0.0717	0.0000	303.1383
Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3462**	**301.3462**	**0.0717**	**0.0000**	**303.1383**

3.7 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5463	22.9681	3.8445	0.0747	1.8361	0.0229	1.8590	0.5303	0.0219	0.5522	0.0000	7,104.7306	7,104.7306	0.4143	0.0000	7,115.0889
Worker	2.5087	1.5264	17.1598	0.0515	5.6234	0.0395	5.6629	1.4947	0.0364	1.5311	0.0000	4,651.7015	4,651.7015	0.1162	0.0000	4,654.6070
Total	**3.0550**	**24.4945**	**21.0043**	**0.1262**	**7.4595**	**0.0624**	**7.5219**	**2.0250**	**0.0583**	**2.0833**	**0.0000**	**11,756.4321**	**11,756.4321**	**0.5306**	**0.0000**	**11,769.6960**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	3.5000e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	301.3458	301.3458	0.0717	0.0000	303.1380
Total	**0.0426**	**0.2905**	**2.2698**	**3.5000e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**301.3458**	**301.3458**	**0.0717**	**0.0000**	**303.1380**

Crows Landing_Phase 1 - Stanislaus County, Annual

3.7 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5463	22.9681	3.8445	0.0747	1.8361	0.0229	1.8590	0.5303	0.0219	0.5522	0.0000	7,104.7306	7,104.7306	0.4143	0.0000	7,115.0889
Worker	2.5087	1.5264	17.1598	0.0515	5.6234	0.0395	5.6629	1.4947	0.0364	1.5311	0.0000	4,651.7015	4,651.7015	0.1162	0.0000	4,654.6070
Total	**3.0550**	**24.4945**	**21.0043**	**0.1262**	**7.4595**	**0.0624**	**7.5219**	**2.0250**	**0.0583**	**2.0833**	**0.0000**	**11,756.4321**	**11,756.4321**	**0.5306**	**0.0000**	**11,769.6960**

3.7 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7223**	**303.7223**	**0.0718**	**0.0000**	**305.5179**

3.7 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5343	22.9552	3.6683	0.0747	1.8501	0.0227	1.8728	0.5343	0.0217	0.5560	0.0000	7,106.776 1	7,106.776 1	0.4200	0.0000	7,117.275 0
Worker	2.3572	1.3820	15.9351	0.0499	5.6667	0.0390	5.7056	1.5062	0.0359	1.5421	0.0000	4,507.542 5	4,507.542 5	0.1054	0.0000	4,510.176 5
Total	**2.8915**	**24.3373**	**19.6034**	**0.1246**	**7.5167**	**0.0617**	**7.5784**	**2.0405**	**0.0576**	**2.0981**	**0.0000**	**11,614.31 85**	**11,614.31 85**	**0.5253**	**0.0000**	**11,627.45 15**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0429	0.2928	2.2873	3.5300e-003		5.3400e-003	5.3400e-003		5.3400e-003	5.3400e-003	0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
Total	**0.0429**	**0.2928**	**2.2873**	**3.5300e-003**		**5.3400e-003**	**5.3400e-003**		**5.3400e-003**	**5.3400e-003**	**0.0000**	**303.7220**	**303.7220**	**0.0718**	**0.0000**	**305.5175**

3.7 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5343	22.9552	3.6683	0.0747	1.8501	0.0227	1.8728	0.5343	0.0217	0.5560	0.0000	7,106.776 1	7,106.776 1	0.4200	0.0000	7,117.275 0
Worker	2.3572	1.3820	15.9351	0.0499	5.6667	0.0390	5.7056	1.5062	0.0359	1.5421	0.0000	4,507.542 5	4,507.542 5	0.1054	0.0000	4,510.176 5
Total	**2.8915**	**24.3373**	**19.6034**	**0.1246**	**7.5167**	**0.0617**	**7.5784**	**2.0405**	**0.0576**	**2.0981**	**0.0000**	**11,614.31 85**	**11,614.31 85**	**0.5253**	**0.0000**	**11,627.45 15**

3.7 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.7 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5190	22.6726	3.4961	0.0739	1.8429	0.0223	1.8652	0.5322	0.0213	0.5535	0.0000	7,030.4844	7,030.4844	0.4192	0.0000	7,040.9654
Worker	2.1989	1.2430	14.6052	0.0477	5.6450	0.0380	5.6830	1.5005	0.0350	1.5354	0.0000	4,311.4415	4,311.4415	0.0946	0.0000	4,313.8057
Total	**2.7179**	**23.9156**	**18.1012**	**0.1216**	**7.4879**	**0.0603**	**7.5482**	**2.0327**	**0.0563**	**2.0889**	**0.0000**	**11,341.9260**	**11,341.9260**	**0.5138**	**0.0000**	**11,354.7711**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	3.5200e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.0428**	**0.2916**	**2.2786**	**3.5200e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.7 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5190	22.6726	3.4961	0.0739	1.8429	0.0223	1.8652	0.5322	0.0213	0.5535	0.0000	7,030.4844	7,030.4844	0.4192	0.0000	7,040.9654
Worker	2.1989	1.2430	14.6052	0.0477	5.6450	0.0380	5.6830	1.5005	0.0350	1.5354	0.0000	4,311.4415	4,311.4415	0.0946	0.0000	4,313.8057
Total	**2.7179**	**23.9156**	**18.1012**	**0.1216**	**7.4879**	**0.0603**	**7.5482**	**2.0327**	**0.0563**	**2.0889**	**0.0000**	**11,341.9260**	**11,341.9260**	**0.5138**	**0.0000**	**11,354.7711**

3.7 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.7 Building Construction - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5078	22.4775	3.3753	0.0735	1.8428	0.0219	1.8647	0.5322	0.0210	0.5531	0.0000	6,986.146 6	6,986.146 6	0.4199	0.0000	6,996.644 7
Worker	2.0676	1.1305	13.4355	0.0460	5.6450	0.0367	5.6817	1.5005	0.0338	1.5342	0.0000	4,156.392 3	4,156.392 3	0.0852	0.0000	4,158.523 1
Total	**2.5754**	**23.6080**	**16.8108**	**0.1194**	**7.4878**	**0.0586**	**7.5464**	**2.0326**	**0.0547**	**2.0874**	**0.0000**	**11,142.53 89**	**11,142.53 89**	**0.5052**	**0.0000**	**11,155.16 78**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	3.5200e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.0428**	**0.2916**	**2.2786**	**3.5200e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.7 Building Construction - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.5078	22.4775	3.3753	0.0735	1.8428	0.0219	1.8647	0.5322	0.0210	0.5531	0.0000	6,986.146 6	6,986.146 6	0.4199	0.0000	6,996.644 7
Worker	2.0676	1.1305	13.4355	0.0460	5.6450	0.0367	5.6817	1.5005	0.0338	1.5342	0.0000	4,156.392 3	4,156.392 3	0.0852	0.0000	4,158.523 1
Total	**2.5754**	**23.6080**	**16.8108**	**0.1194**	**7.4878**	**0.0586**	**7.5464**	**2.0326**	**0.0547**	**2.0874**	**0.0000**	**11,142.53 89**	**11,142.53 89**	**0.5052**	**0.0000**	**11,155.16 78**

3.7 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

3.7 Building Construction - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4981	22.2796	3.2715	0.0730	1.8427	0.0216	1.8642	0.5321	0.0206	0.5527	0.0000	6,947.024 4	6,947.024 4	0.4211	0.0000	6,957.552 1
Worker	1.9428	1.0293	12.4689	0.0444	5.6450	0.0349	5.6799	1.5005	0.0321	1.5326	0.0000	4,012.545 3	4,012.545 3	0.0773	0.0000	4,014.478 3
Total	**2.4409**	**23.3089**	**15.7403**	**0.1174**	**7.4877**	**0.0564**	**7.5441**	**2.0326**	**0.0527**	**2.0853**	**0.0000**	**10,959.56 97**	**10,959.56 97**	**0.4984**	**0.0000**	**10,972.03 03**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	3.5200e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.0428**	**0.2916**	**2.2786**	**3.5200e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

3.7 Building Construction - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.4981	22.2796	3.2715	0.0730	1.8427	0.0216	1.8642	0.5321	0.0206	0.5527	0.0000	6,947.0244	6,947.0244	0.4211	0.0000	6,957.5521
Worker	1.9428	1.0293	12.4689	0.0444	5.6450	0.0349	5.6799	1.5005	0.0321	1.5326	0.0000	4,012.5453	4,012.5453	0.0773	0.0000	4,014.4783
Total	**2.4409**	**23.3089**	**15.7403**	**0.1174**	**7.4877**	**0.0564**	**7.5441**	**2.0326**	**0.0527**	**2.0853**	**0.0000**	**10,959.5697**	**10,959.5697**	**0.4984**	**0.0000**	**10,972.0303**

3.7 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.0935	0.1206	2.0000e-004		3.9600e-003	3.9600e-003		3.7200e-003	3.7200e-003	0.0000	17.3940	17.3940	4.0900e-003	0.0000	17.4962
Total	**0.0103**	**0.0935**	**0.1206**	**2.0000e-004**		**3.9600e-003**	**3.9600e-003**		**3.7200e-003**	**3.7200e-003**	**0.0000**	**17.3940**	**17.3940**	**4.0900e-003**	**0.0000**	**17.4962**

3.7 Building Construction - 2028

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0282	1.2721	0.1834	4.1800e-003	0.1059	1.2200e-003	0.1071	0.0306	1.1700e-003	0.0318	0.0000	397.4464	397.4464	0.0241	0.0000	398.0495
Worker	0.1043	0.0540	0.6681	2.4700e-003	0.3244	1.8700e-003	0.3263	0.0862	1.7200e-003	0.0880	0.0000	223.2598	223.2598	4.0500e-003	0.0000	223.3611
Total	**0.1325**	**1.3261**	**0.8514**	**6.6500e-003**	**0.4303**	**3.0900e-003**	**0.4334**	**0.1168**	**2.8900e-003**	**0.1197**	**0.0000**	**620.7062**	**620.7062**	**0.0282**	**0.0000**	**621.4106**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4600e-003	0.0168	0.1310	2.0000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	17.3939	17.3939	4.0900e-003	0.0000	17.4962
Total	**2.4600e-003**	**0.0168**	**0.1310**	**2.0000e-004**		**3.1000e-004**	**3.1000e-004**		**3.1000e-004**	**3.1000e-004**	**0.0000**	**17.3939**	**17.3939**	**4.0900e-003**	**0.0000**	**17.4962**

3.7 Building Construction - 2028

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0282	1.2721	0.1834	4.1800e-003	0.1059	1.2200e-003	0.1071	0.0306	1.1700e-003	0.0318	0.0000	397.4464	397.4464	0.0241	0.0000	398.0495
Worker	0.1043	0.0540	0.6681	2.4700e-003	0.3244	1.8700e-003	0.3263	0.0862	1.7200e-003	0.0880	0.0000	223.2598	223.2598	4.0500e-003	0.0000	223.3611
Total	**0.1325**	**1.3261**	**0.8514**	**6.6500e-003**	**0.4303**	**3.0900e-003**	**0.4334**	**0.1168**	**2.8900e-003**	**0.1197**	**0.0000**	**620.7062**	**620.7062**	**0.0282**	**0.0000**	**621.4106**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	7.7514	116.8319	86.2959	0.7346	62.5356	0.2472	62.7827	16.7817	0.2318	17.0135	0.0000	68,486.6439	68,486.6439	3.4037	0.0000	68,571.7352
Unmitigated	7.7514	116.8319	86.2959	0.7346	62.5356	0.2472	62.7827	16.7817	0.2318	17.0135	0.0000	68,486.6439	68,486.6439	3.4037	0.0000	68,571.7352

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	44,935.59	8,510.04	4383.96	99,084,851	99,084,851
General Light Industry	16,107.67	3,050.52	1571.48	35,518,084	35,518,084
Office Park	6,600.76	947.92	439.28	12,313,193	12,313,193
Refrigerated Warehouse-No Rail	4,853.52	4,853.52	4853.52	14,169,906	14,169,906
Unrefrigerated Warehouse-No Rail	1,347.36	1,347.36	1347.36	3,933,633	3,933,633
Total	73,844.90	18,709.36	12,595.60	165,019,667	165,019,667

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Office Park	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3
Unrefrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Unrefrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	1.1371	10.3373	8.6833	0.0620		0.7856	0.7856		0.7856	0.7856	0.0000	11,253.3497	11,253.3497	0.2157	0.2063	11,320.2228
NaturalGas Unmitigated	1.1371	10.3373	8.6833	0.0620		0.7856	0.7856		0.7856	0.7856	0.0000	11,253.3497	11,253.3497	0.2157	0.2063	11,320.2228

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	1.34549e+008	0.7255	6.5955	5.5403	0.0396		0.5013	0.5013		0.5013	0.5013	0.0000	7,180.0412	7,180.0412	0.1376	0.1316	7,222.7086
General Light Industry	4.82306e+007	0.2601	2.3642	1.9860	0.0142		0.1797	0.1797		0.1797	0.1797	0.0000	2,573.7669	2,573.7669	0.0493	0.0472	2,589.0615
Office Park	1.31668e+007	0.0710	0.6454	0.5422	3.8700e-003		0.0491	0.0491		0.0491	0.0491	0.0000	702.6327	702.6327	0.0135	0.0129	706.8081
Refrigerated Warehouse-No Rail	433350	2.3400e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	23.1252	23.1252	4.4000e-004	4.2000e-004	23.2626
Unrefrigerated Warehouse-No Rail	1.45002e+007	0.0782	0.7108	0.5971	4.2600e-003		0.0540	0.0540		0.0540	0.0540	0.0000	773.7838	773.7838	0.0148	0.0142	778.3820
Total		**1.1371**	**10.3372**	**8.6833**	**0.0620**		**0.7856**	**0.7856**		**0.7856**	**0.7856**	**0.0000**	**11,253.3497**	**11,253.3497**	**0.2157**	**0.2063**	**11,320.2228**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.82306e+007	0.2601	2.3642	1.9860	0.0142		0.1797	0.1797		0.1797	0.1797	0.0000	2,573.7669	2,573.7669	0.0493	0.0472	2,589.0615
General Light Industry	1.34549e+008	0.7255	6.5955	5.5403	0.0396		0.5013	0.5013		0.5013	0.5013	0.0000	7,180.0412	7,180.0412	0.1376	0.1316	7,222.7086
Office Park	1.31668e+007	0.0710	0.6454	0.5422	3.8700e-003		0.0491	0.0491		0.0491	0.0491	0.0000	702.6327	702.6327	0.0135	0.0129	706.8081
Refrigerated Warehouse-No Rail	433350	2.3400e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	23.1252	23.1252	4.4000e-004	4.2000e-004	23.2626
Unrefrigerated Warehouse-No Rail	1.45002e+007	0.0782	0.7108	0.5971	4.2600e-003		0.0540	0.0540		0.0540	0.0540	0.0000	773.7838	773.7838	0.0148	0.0142	778.3820
Total		**1.1371**	**10.3372**	**8.6833**	**0.0620**		**0.7856**	**0.7856**		**0.7856**	**0.7856**	**0.0000**	**11,253.3497**	**11,253.3497**	**0.2157**	**0.2063**	**11,320.2228**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.0383e +007	0.0000	0.0000	0.0000	0.0000
General Light Industry	5.68625e +007	0.0000	0.0000	0.0000	0.0000
Office Park	6.73948e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	7.1965e +007	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	7.53078e +006	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.0383e +007	0.0000	0.0000	0.0000	0.0000
General Light Industry	5.68625e +007	0.0000	0.0000	0.0000	0.0000
Office Park	6.73948e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	7.1965e +007	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	7.53078e +006	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	59.9449	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478
Unmitigated	59.9449	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.0570					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	50.8770					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0109	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478
Total	**59.9449**	**1.0700e-003**	**0.1189**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2328**	**0.2328**	**6.0000e-004**	**0.0000**	**0.2478**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.0570					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	50.8770					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0109	1.0700e-003	0.1189	1.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	0.2328	0.2328	6.0000e-004	0.0000	0.2478
Total	**59.9449**	**1.0700e-003**	**0.1189**	**1.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.2328**	**0.2328**	**6.0000e-004**	**0.0000**	**0.2478**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	945.9119	97.1542	2.2940	4,058.385 8
Unmitigated	945.9119	97.1542	2.2940	4,058.385 8

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2025.29 / 0	642.5303	65.9940	1.5583	2,756.742 9
Office Park	102.73 / 62.9636	32.5915	3.3475	0.0790	139.8322
Refrigerated Warehouse-No Rail	668.081 / 0	211.9514	21.7694	0.5140	909.3663
Unrefrigerated Warehouse-No Rail	185.463 / 0	58.8387	6.0433	0.1427	252.4444
Total		**945.9119**	**97.1542**	**2.2940**	**4,058.385 8**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2025.29 / 0	642.5303	65.9940	1.5583	2,756.742 9
Office Park	102.73 / 62.9636	32.5915	3.3475	0.0790	139.8322
Refrigerated Warehouse-No Rail	668.081 / 0	211.9514	21.7694	0.5140	909.3663
Unrefrigerated Warehouse-No Rail	185.463 / 0	58.8387	6.0433	0.1427	252.4444
Total		**945.9119**	**97.1542**	**2.2940**	**4,058.385 8**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3,017.866 6	178.3508	0.0000	7,476.636 9
Unmitigated	3,017.866 6	178.3508	0.0000	7,476.636 9

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	10859.9	2,204.465 6	130.2802	0.0000	5,461.470 3
Office Park	537.54	109.1158	6.4486	0.0000	270.3297
Refrigerated Warehouse-No Rail	2715.66	551.2544	32.5782	0.0000	1,365.709 5
Unrefrigerated Warehouse-No Rail	753.88	153.0308	9.0439	0.0000	379.1274
Total		**3,017.866 7**	**178.3508**	**0.0000**	**7,476.636 9**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	10859.9	2,204.465 6	130.2802	0.0000	5,461.470 3
Office Park	537.54	109.1158	6.4486	0.0000	270.3297
Refrigerated Warehouse-No Rail	2715.66	551.2544	32.5782	0.0000	1,365.709 5
Unrefrigerated Warehouse-No Rail	753.88	153.0308	9.0439	0.0000	379.1274
Total		**3,017.866 7**	**178.3508**	**0.0000**	**7,476.636 9**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Crows Landing_Phase 2
Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	381.00	1000sqft	35.00	381,000.00	0
Office Park	247.00	1000sqft	14.00	247,000.00	0
General Light Industry	1,237.00	1000sqft	71.00	1,237,000.00	0
Refrigerated Warehouse-No Rail	990.00	1000sqft	57.00	990,000.00	0
City Park	13.00	Acre	13.00	566,280.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Crows Landing_Phase 2 - Stanislaus County, Annual

Project Characteristics -

Land Use - PD

Construction Phase - Assumed all infrastructure is front-loaded

Grading - Total Phase 2 acreage

Construction Off-road Equipment Mitigation - Potential Tier4 mitigation

Off-road Equipment -

Off-road Equipment - Trenching.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT -

Architectural Coating -

Vehicle Trips -

Area Coating -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

Crows Landing_Phase 2 - Stanislaus County, Annual

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	220.00	139.00
tblConstructionPhase	NumDays	3,100.00	1,956.00
tblConstructionPhase	NumDays	310.00	196.00
tblConstructionPhase	NumDays	220.00	139.00
tblConstructionPhase	NumDays	120.00	76.00
tblConstructionPhase	PhaseEndDate	3/18/2044	2/4/2031
tblConstructionPhase	PhaseEndDate	7/11/2042	1/21/2038
tblConstructionPhase	PhaseEndDate	8/23/2030	10/1/2029
tblConstructionPhase	PhaseEndDate	5/15/2043	2/4/2031

tblConstructionPhase	PhaseEndDate	6/15/2029	7/24/2030
tblConstructionPhase	PhaseEndDate	8/23/2030	4/9/2030
tblConstructionPhase	PhaseStartDate	5/16/2043	7/25/2030
tblConstructionPhase	PhaseStartDate	8/24/2030	7/25/2030
tblConstructionPhase	PhaseStartDate	6/16/2029	1/1/2029
tblConstructionPhase	PhaseStartDate	7/12/2042	7/25/2030
tblConstructionPhase	PhaseStartDate	1/1/2029	4/10/2030
tblConstructionPhase	PhaseStartDate	8/24/2030	10/2/2029
tblGrading	AcresOfGrading	490.00	190.00
tblGrading	AcresOfGrading	0.00	190.00
tblLandUse	GreenSpaceAllowEdit	1.00	0.00
tblLandUse	LotAcreage	8.75	35.00
tblLandUse	LotAcreage	5.67	14.00
tblLandUse	LotAcreage	28.40	71.00
tblLandUse	LotAcreage	22.73	57.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2029	0.2928	2.7430	2.6375	6.3100e-003	0.7225	0.1110	0.8335	0.3437	0.1021	0.4458	0.0000	555.0737	555.0737	0.1731	0.0000	559.4013
2030	20.1815	4.3933	5.1847	0.0228	2.2088	0.0667	2.2755	0.7700	0.0662	0.8362	0.0000	2,063.8512	2,063.8512	0.0856	0.0000	2,065.9923
2031	5.1007	6.9760	6.6616	0.0377	2.7105	0.0388	2.7492	0.7304	0.0378	0.7682	0.0000	3,468.2624	3,468.2624	0.1452	0.0000	3,471.8911
2032	0.7530	6.8499	6.1696	0.0368	2.6756	0.0336	2.7092	0.7212	0.0326	0.7538	0.0000	3,386.4083	3,386.4083	0.1418	0.0000	3,389.9526
2033	0.7107	6.7572	5.9314	0.0362	2.6552	0.0327	2.6879	0.7157	0.0318	0.7474	0.0000	3,332.2327	3,332.2327	0.1390	0.0000	3,335.7079
2034	0.6788	6.7218	5.7511	0.0359	2.6552	0.0321	2.6872	0.7157	0.0312	0.7469	0.0000	3,308.0410	3,308.0410	0.1374	0.0000	3,311.4753
2035	0.6417	6.6165	5.6138	0.0358	2.6654	0.0241	2.6895	0.7184	0.0233	0.7417	0.0000	3,300.2038	3,300.2038	0.1356	0.0000	3,303.5948
2036	0.6441	6.6419	5.6353	0.0360	2.6756	0.0242	2.6998	0.7212	0.0234	0.7445	0.0000	3,312.8482	3,312.8482	0.1362	0.0000	3,316.2523
2037	0.6417	6.6165	5.6138	0.0358	2.6654	0.0241	2.6895	0.7184	0.0233	0.7417	0.0000	3,300.2038	3,300.2038	0.1356	0.0000	3,303.5948
2038	0.0369	0.3803	0.3226	2.0600e-003	0.1532	1.3800e-003	0.1546	0.0413	1.3400e-003	0.0426	0.0000	189.6669	189.6669	7.8000e-003	0.0000	189.8618
Maximum	**20.1815**	**6.9760**	**6.6616**	**0.0377**	**2.7105**	**0.1110**	**2.7492**	**0.7700**	**0.1021**	**0.8362**	**0.0000**	**3,468.2624**	**3,468.2624**	**0.1731**	**0.0000**	**3,471.8911**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2029	0.0831	0.3280	3.2910	6.3100e-003	0.3425	0.0101	0.3526	0.1593	0.0101	0.1694	0.0000	555.0731	555.0731	0.1731	0.0000	559.4007
2030	19.9272	2.9362	5.6918	0.0228	1.7758	0.0166	1.7924	0.5565	0.0160	0.5725	0.0000	2,063.850 5	2,063.850 5	0.0856	0.0000	2,065.991 6
2031	4.9575	6.1492	6.8502	0.0377	2.7105	0.0209	2.7314	0.7304	0.0199	0.7503	0.0000	3,468.262 0	3,468.262 0	0.1452	0.0000	3,471.890 6
2032	0.6245	6.1032	6.3403	0.0368	2.6756	0.0195	2.6952	0.7212	0.0186	0.7398	0.0000	3,386.407 9	3,386.407 9	0.1418	0.0000	3,389.952 2
2033	0.5831	6.0162	6.1009	0.0362	2.6552	0.0187	2.6739	0.7157	0.0178	0.7335	0.0000	3,332.232 3	3,332.232 3	0.1390	0.0000	3,335.707 5
2034	0.5512	5.9808	5.9206	0.0359	2.6552	0.0181	2.6733	0.7157	0.0173	0.7329	0.0000	3,308.040 6	3,308.040 6	0.1374	0.0000	3,311.474 9
2035	0.5257	5.9736	5.7890	0.0358	2.6654	0.0176	2.6830	0.7184	0.0168	0.7352	0.0000	3,300.203 3	3,300.203 3	0.1356	0.0000	3,303.594 4
2036	0.5277	5.9965	5.8112	0.0360	2.6756	0.0177	2.6933	0.7212	0.0169	0.7380	0.0000	3,312.847 8	3,312.847 8	0.1362	0.0000	3,316.251 9
2037	0.5257	5.9736	5.7890	0.0358	2.6654	0.0176	2.6830	0.7184	0.0168	0.7352	0.0000	3,300.203 3	3,300.203 3	0.1356	0.0000	3,303.594 4
2038	0.0302	0.3433	0.3327	2.0600e-003	0.1532	1.0100e-003	0.1542	0.0413	9.6000e-004	0.0423	0.0000	189.6669	189.6669	7.8000e-003	0.0000	189.8618
Maximum	**19.9272**	**6.1492**	**6.8502**	**0.0377**	**2.7105**	**0.0209**	**2.7314**	**0.7304**	**0.0199**	**0.7503**	**0.0000**	**3,468.262 0**	**3,468.262 0**	**0.1731**	**0.0000**	**3,471.890 6**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**4.53**	**16.26**	**-4.84**	**0.00**	**3.73**	**59.38**	**4.71**	**6.42**	**59.49**	**9.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Crows Landing_Phase 2 - Stanislaus County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2029	3-31-2029	0.9951	0.1342
2	4-1-2029	6-30-2029	1.0059	0.1354
3	7-1-2029	9-30-2029	1.0169	0.1369
4	10-1-2029	12-31-2029	0.0144	0.0048
5	1-1-2030	3-31-2030	0.0030	0.0030
6	4-1-2030	6-30-2030	0.8103	0.1292
7	7-1-2030	9-30-2030	10.2573	9.7054
8	10-1-2030	12-31-2030	13.5792	13.1021
9	1-1-2031	3-31-2031	6.3158	6.0031
10	4-1-2031	6-30-2031	1.9054	1.6882
11	7-1-2031	9-30-2031	1.9263	1.7068
12	10-1-2031	12-31-2031	1.9440	1.7245
13	1-1-2032	3-31-2032	1.8988	1.6817
14	4-1-2032	6-30-2032	1.8826	1.6654
15	7-1-2032	9-30-2032	1.9033	1.6837
16	10-1-2032	12-31-2032	1.9197	1.7002
17	1-1-2033	3-31-2033	1.8576	1.6428
18	4-1-2033	6-30-2033	1.8630	1.6459
19	7-1-2033	9-30-2033	1.8835	1.6640
20	10-1-2033	12-31-2033	1.8989	1.6793
21	1-1-2034	3-31-2034	1.8398	1.6250
22	4-1-2034	6-30-2034	1.8458	1.6286
23	7-1-2034	9-30-2034	1.8661	1.6465
24	10-1-2034	12-31-2034	1.8807	1.6611
25	1-1-2035	3-31-2035	1.7967	1.6098
26	4-1-2035	6-30-2035	1.8028	1.6138

Crows Landing_Phase 2 - Stanislaus County, Annual

27	**7-1-2035**	**9-30-2035**	1.8226	1.6315
28	**10-1-2035**	**12-31-2035**	1.8366	1.6455
29	**1-1-2036**	**3-31-2036**	1.8167	1.6277
30	**4-1-2036**	**6-30-2036**	1.8028	1.6138
31	**7-1-2036**	**9-30-2036**	1.8226	1.6315
32	**10-1-2036**	**12-31-2036**	1.8366	1.6455
33	**1-1-2037**	**3-31-2037**	1.7967	1.6098
34	**4-1-2037**	**6-30-2037**	1.8028	1.6138
35	**7-1-2037**	**9-30-2037**	1.8226	1.6315
36	**10-1-2037**	**12-31-2037**	1.8366	1.6455
37	**1-1-2038**	**3-31-2038**	0.4192	0.3756
		Highest	13.5792	13.1021

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	15.7429	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546
Energy	0.1972	1.7923	1.5056	0.0108		0.1362	0.1362		0.1362	0.1362	0.0000	1,951.1623	1,951.1623	0.0374	0.0358	1,962.7571
Mobile	3.7334	57.6855	40.0789	0.3400	28.4362	0.1136	28.5498	7.6310	0.1065	7.7375	0.0000	31,704.8981	31,704.8981	1.6906	0.0000	31,747.1621
Waste						0.0000	0.0000		0.0000	0.0000	619.0494	0.0000	619.0494	36.5848	0.0000	1,533.6686
Water						0.0000	0.0000		0.0000	0.0000	201.3240	0.0000	201.3240	20.6779	0.4883	863.7702
Total	**19.6734**	**59.4780**	**41.6106**	**0.3507**	**28.4362**	**0.2499**	**28.6861**	**7.6310**	**0.2428**	**7.8738**	**820.3734**	**33,656.1117**	**34,476.4850**	**58.9908**	**0.5240**	**36,107.4125**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	15.7429	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546
Energy	0.1972	1.7923	1.5056	0.0108		0.1362	0.1362		0.1362	0.1362	0.0000	1,951.1623	1,951.1623	0.0374	0.0358	1,962.7571
Mobile	3.7334	57.6855	40.0789	0.3400	28.4362	0.1136	28.5498	7.6310	0.1065	7.7375	0.0000	31,704.8981	31,704.8981	1.6906	0.0000	31,747.1621
Waste						0.0000	0.0000		0.0000	0.0000	619.0494	0.0000	619.0494	36.5848	0.0000	1,533.6686
Water						0.0000	0.0000		0.0000	0.0000	201.3240	0.0000	201.3240	20.6779	0.4883	863.7702
Total	**19.6734**	**59.4780**	**41.6106**	**0.3507**	**28.4362**	**0.2499**	**28.6861**	**7.6310**	**0.2428**	**7.8738**	**820.3734**	**33,656.1117**	**34,476.4850**	**58.9908**	**0.5240**	**36,107.4125**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Crows Landing_Phase 2 - Stanislaus County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/10/2030	7/24/2030	5	76	
2	Grading	Grading	1/1/2029	10/1/2029	5	196	
3	Trenching	Trenching	10/2/2029	4/9/2030	5	136	
4	Building Construction	Building Construction	7/25/2030	1/21/2038	5	1956	
5	Paving	Paving	7/25/2030	2/4/2031	5	139	
6	Architectural Coating	Architectural Coating	7/25/2030	2/4/2031	5	139	

Acres of Grading (Site Preparation Phase): 190

Acres of Grading (Grading Phase): 190

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 5,131,920; Non-Residential Outdoor: 1,710,640; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Crows Landing_Phase 2 - Stanislaus County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Rubber Tired Dozers	3		247	0.40
Trenching	Tractors/Loaders/Backhoes	4		97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	1,374.00	561.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	275.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.7873	0.0000	0.7873	0.3882	0.0000	0.3882	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1593	0.8825	0.8817	2.9600e-003		0.0303	0.0303		0.0303	0.0303	0.0000	254.4314	254.4314	0.0129	0.0000	254.7541
Total	**0.1593**	**0.8825**	**0.8817**	**2.9600e-003**	**0.7873**	**0.0303**	**0.8176**	**0.3882**	**0.0303**	**0.4185**	**0.0000**	**254.4314**	**254.4314**	**0.0129**	**0.0000**	**254.7541**

3.2 Site Preparation - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8800e-003	3.1400e-003	0.0399	1.7000e-004	0.0440	1.1000e-004	0.0442	0.0113	1.0000e-004	0.0114	0.0000	15.1973	15.1973	2.4000e-004	0.0000	15.2032
Total	**5.8800e-003**	**3.1400e-003**	**0.0399**	**1.7000e-004**	**0.0440**	**1.1000e-004**	**0.0442**	**0.0113**	**1.0000e-004**	**0.0114**	**0.0000**	**15.1973**	**15.1973**	**2.4000e-004**	**0.0000**	**15.2032**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3543	0.0000	0.3543	0.1747	0.0000	0.1747	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.1283	1.2301	2.9600e-003		3.9500e-003	3.9500e-003		3.9500e-003	3.9500e-003	0.0000	254.4311	254.4311	0.0129	0.0000	254.7538
Total	**0.0296**	**0.1283**	**1.2301**	**2.9600e-003**	**0.3543**	**3.9500e-003**	**0.3582**	**0.1747**	**3.9500e-003**	**0.1787**	**0.0000**	**254.4311**	**254.4311**	**0.0129**	**0.0000**	**254.7538**

3.2 Site Preparation - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8800e-003	3.1400e-003	0.0399	1.7000e-004	0.0440	1.1000e-004	0.0442	0.0113	1.0000e-004	0.0114	0.0000	15.1973	15.1973	2.4000e-004	0.0000	15.2032
Total	**5.8800e-003**	**3.1400e-003**	**0.0399**	**1.7000e-004**	**0.0440**	**1.1000e-004**	**0.0442**	**0.0113**	**1.0000e-004**	**0.0114**	**0.0000**	**15.1973**	**15.1973**	**2.4000e-004**	**0.0000**	**15.2032**

3.3 Grading - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.6909	0.0000	0.6909	0.3353	0.0000	0.3353	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2843	2.7384	2.5805	6.0800e-003		0.1108	0.1108		0.1020	0.1020	0.0000	534.1609	534.1609	0.1728	0.0000	538.4798
Total	**0.2843**	**2.7384**	**2.5805**	**6.0800e-003**	**0.6909**	**0.1108**	**0.8017**	**0.3353**	**0.1020**	**0.4372**	**0.0000**	**534.1609**	**534.1609**	**0.1728**	**0.0000**	**538.4798**

3.3 Grading - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5500e-003	3.5400e-003	0.0439	1.8000e-004	0.0244	1.3000e-004	0.0245	6.4700e-003	1.2000e-004	6.5900e-003	0.0000	16.1058	16.1058	2.7000e-004	0.0000	16.1124
Total	**6.5500e-003**	**3.5400e-003**	**0.0439**	**1.8000e-004**	**0.0244**	**1.3000e-004**	**0.0245**	**6.4700e-003**	**1.2000e-004**	**6.5900e-003**	**0.0000**	**16.1058**	**16.1058**	**2.7000e-004**	**0.0000**	**16.1124**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3109	0.0000	0.3109	0.1509	0.0000	0.1509	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0746	0.3234	3.2339	6.0800e-003		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	534.1603	534.1603	0.1728	0.0000	538.4792
Total	**0.0746**	**0.3234**	**3.2339**	**6.0800e-003**	**0.3109**	**9.9500e-003**	**0.3209**	**0.1509**	**9.9500e-003**	**0.1608**	**0.0000**	**534.1603**	**534.1603**	**0.1728**	**0.0000**	**538.4792**

3.3 Grading - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5500e-003	3.5400e-003	0.0439	1.8000e-004	0.0244	1.3000e-004	0.0245	6.4700e-003	1.2000e-004	6.5900e-003	0.0000	16.1058	16.1058	2.7000e-004	0.0000	16.1124
Total	**6.5500e-003**	**3.5400e-003**	**0.0439**	**1.8000e-004**	**0.0244**	**1.3000e-004**	**0.0245**	**6.4700e-003**	**1.2000e-004**	**6.5900e-003**	**0.0000**	**16.1058**	**16.1058**	**2.7000e-004**	**0.0000**	**16.1124**

3.4 Trenching - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Trenching - 2029

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9500e-003	1.0600e-003	0.0131	5.0000e-005	7.2700e-003	4.0000e-005	7.3000e-003	1.9300e-003	3.0000e-005	1.9700e-003	0.0000	4.8071	4.8071	8.0000e-005	0.0000	4.8091
Total	**1.9500e-003**	**1.0600e-003**	**0.0131**	**5.0000e-005**	**7.2700e-003**	**4.0000e-005**	**7.3000e-003**	**1.9300e-003**	**3.0000e-005**	**1.9700e-003**	**0.0000**	**4.8071**	**4.8071**	**8.0000e-005**	**0.0000**	**4.8091**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Trenching - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9500e-003	1.0600e-003	0.0131	5.0000e-005	7.2700e-003	4.0000e-005	7.3000e-003	1.9300e-003	3.0000e-005	1.9700e-003	0.0000	4.8071	4.8071	8.0000e-005	0.0000	4.8091
Total	**1.9500e-003**	**1.0600e-003**	**0.0131**	**5.0000e-005**	**7.2700e-003**	**4.0000e-005**	**7.3000e-003**	**1.9300e-003**	**3.0000e-005**	**1.9700e-003**	**0.0000**	**4.8071**	**4.8071**	**8.0000e-005**	**0.0000**	**4.8091**

3.4 Trenching - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Trenching - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9800e-003	1.0600e-003	0.0134	6.0000e-005	7.9400e-003	4.0000e-005	7.9800e-003	2.1100e-003	4.0000e-005	2.1400e-003	0.0000	5.1111	5.1111	8.0000e-005	0.0000	5.1131
Total	**1.9800e-003**	**1.0600e-003**	**0.0134**	**6.0000e-005**	**7.9400e-003**	**4.0000e-005**	**7.9800e-003**	**2.1100e-003**	**4.0000e-005**	**2.1400e-003**	**0.0000**	**5.1111**	**5.1111**	**8.0000e-005**	**0.0000**	**5.1131**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Trenching - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9800e-003	1.0600e-003	0.0134	6.0000e-005	7.9400e-003	4.0000e-005	7.9800e-003	2.1100e-003	4.0000e-005	2.1400e-003	0.0000	5.1111	5.1111	8.0000e-005	0.0000	5.1131
Total	**1.9800e-003**	**1.0600e-003**	**0.0134**	**6.0000e-005**	**7.9400e-003**	**4.0000e-005**	**7.9800e-003**	**2.1100e-003**	**4.0000e-005**	**2.1400e-003**	**0.0000**	**5.1111**	**5.1111**	**8.0000e-005**	**0.0000**	**5.1131**

3.5 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0746	0.4523	0.9210	1.7600e-003		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	149.8308	149.8308	6.0100e-003	0.0000	149.9811
Total	**0.0746**	**0.4523**	**0.9210**	**1.7600e-003**		**8.4400e-003**	**8.4400e-003**		**8.4400e-003**	**8.4400e-003**	**0.0000**	**149.8308**	**149.8308**	**6.0100e-003**	**0.0000**	**149.9811**

3.5 Building Construction - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0515	2.4428	0.3318	7.6600e-003	0.1913	2.1600e-003	0.1934	0.0552	2.0700e-003	0.0573	0.0000	728.7095	728.7095	0.0476	0.0000	729.9005
Worker	0.2424	0.1295	1.6441	6.9200e-003	0.9730	4.6700e-003	0.9776	0.2586	4.3000e-003	0.2629	0.0000	626.4336	626.4336	9.7000e-003	0.0000	626.6761
Total	**0.2939**	**2.5723**	**1.9759**	**0.0146**	**1.1642**	**6.8300e-003**	**1.1711**	**0.3138**	**6.3700e-003**	**0.3202**	**0.0000**	**1,355.1431**	**1,355.1431**	**0.0573**	**0.0000**	**1,356.5765**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0187	0.1274	0.9952	1.7600e-003		2.3200e-003	2.3200e-003		2.3200e-003	2.3200e-003	0.0000	149.8306	149.8306	6.0100e-003	0.0000	149.9809
Total	**0.0187**	**0.1274**	**0.9952**	**1.7600e-003**		**2.3200e-003**	**2.3200e-003**		**2.3200e-003**	**2.3200e-003**	**0.0000**	**149.8306**	**149.8306**	**6.0100e-003**	**0.0000**	**149.9809**

3.5 Building Construction - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0515	2.4428	0.3318	7.6600e-003	0.1913	2.1600e-003	0.1934	0.0552	2.0700e-003	0.0573	0.0000	728.7095	728.7095	0.0476	0.0000	729.9005
Worker	0.2424	0.1295	1.6441	6.9200e-003	0.9730	4.6700e-003	0.9776	0.2586	4.3000e-003	0.2629	0.0000	626.4336	626.4336	9.7000e-003	0.0000	626.6761
Total	**0.2939**	**2.5723**	**1.9759**	**0.0146**	**1.1642**	**6.8300e-003**	**1.1711**	**0.3138**	**6.3700e-003**	**0.3202**	**0.0000**	**1,355.1431**	**1,355.1431**	**0.0573**	**0.0000**	**1,356.5765**

3.5 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

3.5 Building Construction - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1168	5.5656	0.7479	0.0175	0.4379	4.9000e-003	0.4428	0.1265	4.6800e-003	0.1312	0.0000	1,664.0756	1,664.0756	0.1092	0.0000	1,666.8067
Worker	0.5057	0.2698	3.5137	0.0155	2.2276	9.9600e-003	2.2375	0.5920	9.1600e-003	0.6011	0.0000	1,399.5431	1,399.5431	0.0202	0.0000	1,400.0478
Total	**0.6225**	**5.8353**	**4.2615**	**0.0330**	**2.6654**	**0.0149**	**2.6803**	**0.7184**	**0.0138**	**0.7323**	**0.0000**	**3,063.6187**	**3,063.6187**	**0.1294**	**0.0000**	**3,066.8545**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

3.5 Building Construction - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1168	5.5656	0.7479	0.0175	0.4379	4.9000e-003	0.4428	0.1265	4.6800e-003	0.1312	0.0000	1,664.0756	1,664.0756	0.1092	0.0000	1,666.8067
Worker	0.5057	0.2698	3.5137	0.0155	2.2276	9.9600e-003	2.2375	0.5920	9.1600e-003	0.6011	0.0000	1,399.5431	1,399.5431	0.0202	0.0000	1,400.0478
Total	**0.6225**	**5.8353**	**4.2615**	**0.0330**	**2.6654**	**0.0149**	**2.6803**	**0.7184**	**0.0138**	**0.7323**	**0.0000**	**3,063.6187**	**3,063.6187**	**0.1294**	**0.0000**	**3,066.8545**

3.5 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3479	344.3479	0.0138	0.0000	344.6933
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3479**	**344.3479**	**0.0138**	**0.0000**	**344.6933**

3.5 Building Construction - 2032

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1164	5.5622	0.7425	0.0175	0.4395	4.8700e-003	0.4444	0.1270	4.6500e-003	0.1316	0.0000	1,667.6121	1,667.6121	0.1094	0.0000	1,670.3476
Worker	0.4651	0.2482	3.3105	0.0152	2.2361	9.3200e-003	2.2454	0.5942	8.5700e-003	0.6028	0.0000	1,374.4483	1,374.4483	0.0185	0.0000	1,374.9118
Total	**0.5815**	**5.8105**	**4.0530**	**0.0327**	**2.6756**	**0.0142**	**2.6898**	**0.7212**	**0.0132**	**0.7344**	**0.0000**	**3,042.0604**	**3,042.0604**	**0.1280**	**0.0000**	**3,045.2593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0429	0.2928	2.2873	4.0600e-003		5.3400e-003	5.3400e-003		5.3400e-003	5.3400e-003	0.0000	344.3475	344.3475	0.0138	0.0000	344.6929
Total	**0.0429**	**0.2928**	**2.2873**	**4.0600e-003**		**5.3400e-003**	**5.3400e-003**		**5.3400e-003**	**5.3400e-003**	**0.0000**	**344.3475**	**344.3475**	**0.0138**	**0.0000**	**344.6929**

3.5 Building Construction - 2032

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1164	5.5622	0.7425	0.0175	0.4395	4.8700e-003	0.4444	0.1270	4.6500e-003	0.1316	0.0000	1,667.6121	1,667.6121	0.1094	0.0000	1,670.3476
Worker	0.4651	0.2482	3.3105	0.0152	2.2361	9.3200e-003	2.2454	0.5942	8.5700e-003	0.6028	0.0000	1,374.4483	1,374.4483	0.0185	0.0000	1,374.9118
Total	**0.5815**	**5.8105**	**4.0530**	**0.0327**	**2.6756**	**0.0142**	**2.6898**	**0.7212**	**0.0132**	**0.7344**	**0.0000**	**3,042.0604**	**3,042.0604**	**0.1280**	**0.0000**	**3,045.2593**

3.5 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

3.5 Building Construction - 2033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1149	5.4982	0.7307	0.0174	0.4362	4.7900e-003	0.4410	0.1260	4.5800e-003	0.1306	0.0000	1,652.8754	1,652.8754	0.1084	0.0000	1,655.5846
Worker	0.4256	0.2275	3.1003	0.0148	2.2190	8.6300e-003	2.2277	0.5897	7.9400e-003	0.5976	0.0000	1,337.6380	1,337.6380	0.0169	0.0000	1,338.0612
Total	**0.5405**	**5.7257**	**3.8310**	**0.0322**	**2.6552**	**0.0134**	**2.6686**	**0.7157**	**0.0125**	**0.7282**	**0.0000**	**2,990.5134**	**2,990.5134**	**0.1253**	**0.0000**	**2,993.6459**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	4.0200e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.0426**	**0.2905**	**2.2698**	**4.0200e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

3.5 Building Construction - 2033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1149	5.4982	0.7307	0.0174	0.4362	4.7900e-003	0.4410	0.1260	4.5800e-003	0.1306	0.0000	1,652.875 4	1,652.875 4	0.1084	0.0000	1,655.584 6
Worker	0.4256	0.2275	3.1003	0.0148	2.2190	8.6300e-003	2.2277	0.5897	7.9400e-003	0.5976	0.0000	1,337.638 0	1,337.638 0	0.0169	0.0000	1,338.061 2
Total	**0.5405**	**5.7257**	**3.8310**	**0.0322**	**2.6552**	**0.0134**	**2.6686**	**0.7157**	**0.0125**	**0.7282**	**0.0000**	**2,990.513 4**	**2,990.513 4**	**0.1253**	**0.0000**	**2,993.645 9**

3.5 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

3.5 Building Construction - 2034

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4789	0.7255	0.0174	0.4362	4.7400e-003	0.4409	0.1260	4.5400e-003	0.1305	0.0000	1,651.5896	1,651.5896	0.1081	0.0000	1,654.2920
Worker	0.3943	0.2115	2.9252	0.0145	2.2190	8.0500e-003	2.2271	0.5897	7.4100e-003	0.5971	0.0000	1,314.7321	1,314.7321	0.0156	0.0000	1,315.1212
Total	**0.5086**	**5.6903**	**3.6507**	**0.0319**	**2.6552**	**0.0128**	**2.6680**	**0.7157**	**0.0120**	**0.7276**	**0.0000**	**2,966.3217**	**2,966.3217**	**0.1237**	**0.0000**	**2,969.4132**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	4.0200e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.0426**	**0.2905**	**2.2698**	**4.0200e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

3.5 Building Construction - 2034

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4789	0.7255	0.0174	0.4362	4.7400e-003	0.4409	0.1260	4.5400e-003	0.1305	0.0000	1,651.5896	1,651.5896	0.1081	0.0000	1,654.2920
Worker	0.3943	0.2115	2.9252	0.0145	2.2190	8.0500e-003	2.2271	0.5897	7.4100e-003	0.5971	0.0000	1,314.7321	1,314.7321	0.0156	0.0000	1,315.1212
Total	**0.5086**	**5.6903**	**3.6507**	**0.0319**	**2.6552**	**0.0128**	**2.6680**	**0.7157**	**0.0120**	**0.7276**	**0.0000**	**2,966.3217**	**2,966.3217**	**0.1237**	**0.0000**	**2,969.4132**

3.5 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

3.5 Building Construction - 2035

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4822	0.7236	0.0174	0.4378	4.7200e-003	0.4426	0.1265	4.5200e-003	0.1310	0.0000	1,657.075 5	1,657.075 5	0.1084	0.0000	1,659.785 5
Worker	0.3686	0.1998	2.7868	0.0144	2.2276	7.5600e-003	2.2351	0.5920	6.9500e-003	0.5989	0.0000	1,300.094 7	1,300.094 7	0.0145	0.0000	1,300.456 3
Total	**0.4829**	**5.6820**	**3.5104**	**0.0318**	**2.6654**	**0.0123**	**2.6777**	**0.7184**	**0.0115**	**0.7299**	**0.0000**	**2,957.170 1**	**2,957.170 1**	**0.1229**	**0.0000**	**2,960.241 8**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

3.5 Building Construction - 2035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4822	0.7236	0.0174	0.4378	4.7200e-003	0.4426	0.1265	4.5200e-003	0.1310	0.0000	1,657.0755	1,657.0755	0.1084	0.0000	1,659.7855
Worker	0.3686	0.1998	2.7868	0.0144	2.2276	7.5600e-003	2.2351	0.5920	6.9500e-003	0.5989	0.0000	1,300.0947	1,300.0947	0.0145	0.0000	1,300.4563
Total	**0.4829**	**5.6820**	**3.5104**	**0.0318**	**2.6654**	**0.0123**	**2.6777**	**0.7184**	**0.0115**	**0.7299**	**0.0000**	**2,957.1701**	**2,957.1701**	**0.1229**	**0.0000**	**2,960.2418**

3.5 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1594	0.9381	2.1114	4.0600e-003		0.0118	0.0118		0.0118	0.0118	0.0000	344.3479	344.3479	0.0128	0.0000	344.6686
Total	**0.1594**	**0.9381**	**2.1114**	**4.0600e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**344.3479**	**344.3479**	**0.0128**	**0.0000**	**344.6686**

3.5 Building Construction - 2036

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1147	5.5032	0.7264	0.0175	0.4395	4.7400e-003	0.4443	0.1269	4.5300e-003	0.1315	0.0000	1,663.4244	1,663.4244	0.1088	0.0000	1,666.1448
Worker	0.3700	0.2006	2.7975	0.0144	2.2361	7.5900e-003	2.2437	0.5942	6.9800e-003	0.6012	0.0000	1,305.0759	1,305.0759	0.0145	0.0000	1,305.4389
Total	**0.4847**	**5.7037**	**3.5239**	**0.0319**	**2.6756**	**0.0123**	**2.6879**	**0.7212**	**0.0115**	**0.7327**	**0.0000**	**2,968.5003**	**2,968.5003**	**0.1233**	**0.0000**	**2,971.5837**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0429	0.2928	2.2873	4.0600e-003		5.3400e-003	5.3400e-003		5.3400e-003	5.3400e-003	0.0000	344.3475	344.3475	0.0128	0.0000	344.6682
Total	**0.0429**	**0.2928**	**2.2873**	**4.0600e-003**		**5.3400e-003**	**5.3400e-003**		**5.3400e-003**	**5.3400e-003**	**0.0000**	**344.3475**	**344.3475**	**0.0128**	**0.0000**	**344.6682**

3.5 Building Construction - 2036

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1147	5.5032	0.7264	0.0175	0.4395	4.7400e-003	0.4443	0.1269	4.5300e-003	0.1315	0.0000	1,663.4244	1,663.4244	0.1088	0.0000	1,666.1448
Worker	0.3700	0.2006	2.7975	0.0144	2.2361	7.5900e-003	2.2437	0.5942	6.9800e-003	0.6012	0.0000	1,305.0759	1,305.0759	0.0145	0.0000	1,305.4389
Total	**0.4847**	**5.7037**	**3.5239**	**0.0319**	**2.6756**	**0.0123**	**2.6879**	**0.7212**	**0.0115**	**0.7327**	**0.0000**	**2,968.5003**	**2,968.5003**	**0.1233**	**0.0000**	**2,971.5837**

3.5 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

3.5 Building Construction - 2037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4822	0.7236	0.0174	0.4378	4.7200e-003	0.4426	0.1265	4.5200e-003	0.1310	0.0000	1,657.0755	1,657.0755	0.1084	0.0000	1,659.7855
Worker	0.3686	0.1998	2.7868	0.0144	2.2276	7.5600e-003	2.2351	0.5920	6.9500e-003	0.5989	0.0000	1,300.0947	1,300.0947	0.0145	0.0000	1,300.4563
Total	**0.4829**	**5.6820**	**3.5104**	**0.0318**	**2.6654**	**0.0123**	**2.6777**	**0.7184**	**0.0115**	**0.7299**	**0.0000**	**2,957.1701**	**2,957.1701**	**0.1229**	**0.0000**	**2,960.2418**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

3.5 Building Construction - 2037

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1143	5.4822	0.7236	0.0174	0.4378	4.7200e-003	0.4426	0.1265	4.5200e-003	0.1310	0.0000	1,657.075 5	1,657.075 5	0.1084	0.0000	1,659.785 5
Worker	0.3686	0.1998	2.7868	0.0144	2.2276	7.5600e-003	2.2351	0.5920	6.9500e-003	0.5989	0.0000	1,300.094 7	1,300.094 7	0.0145	0.0000	1,300.456 3
Total	**0.4829**	**5.6820**	**3.5104**	**0.0318**	**2.6654**	**0.0123**	**2.6777**	**0.7184**	**0.0115**	**0.7299**	**0.0000**	**2,957.170 1**	**2,957.170 1**	**0.1229**	**0.0000**	**2,960.241 8**

3.5 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1300e-003	0.0537	0.1209	2.3000e-004		6.8000e-004	6.8000e-004		6.8000e-004	6.8000e-004	0.0000	19.7146	19.7146	7.3000e-004	0.0000	19.7329
Total	**9.1300e-003**	**0.0537**	**0.1209**	**2.3000e-004**		**6.8000e-004**	**6.8000e-004**		**6.8000e-004**	**6.8000e-004**	**0.0000**	**19.7146**	**19.7146**	**7.3000e-004**	**0.0000**	**19.7329**

3.5 Building Construction - 2038

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5700e-003	0.3151	0.0416	1.0000e-003	0.0252	2.7000e-004	0.0254	7.2700e-003	2.6000e-004	7.5300e-003	0.0000	95.2342	95.2342	6.2300e-003	0.0000	95.3900
Worker	0.0212	0.0115	0.1602	8.2000e-004	0.1280	4.3000e-004	0.1285	0.0340	4.0000e-004	0.0344	0.0000	74.7181	74.7181	8.3000e-004	0.0000	74.7389
Total	**0.0278**	**0.3266**	**0.2018**	**1.8200e-003**	**0.1532**	**7.0000e-004**	**0.1539**	**0.0413**	**6.6000e-004**	**0.0420**	**0.0000**	**169.9523**	**169.9523**	**7.0600e-003**	**0.0000**	**170.1288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4600e-003	0.0168	0.1310	2.3000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	19.7146	19.7146	7.3000e-004	0.0000	19.7329
Total	**2.4600e-003**	**0.0168**	**0.1310**	**2.3000e-004**		**3.1000e-004**	**3.1000e-004**		**3.1000e-004**	**3.1000e-004**	**0.0000**	**19.7146**	**19.7146**	**7.3000e-004**	**0.0000**	**19.7329**

3.5 Building Construction - 2038

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.5700e-003	0.3151	0.0416	1.0000e-003	0.0252	2.7000e-004	0.0254	7.2700e-003	2.6000e-004	7.5300e-003	0.0000	95.2342	95.2342	6.2300e-003	0.0000	95.3900
Worker	0.0212	0.0115	0.1602	8.2000e-004	0.1280	4.3000e-004	0.1285	0.0340	4.0000e-004	0.0344	0.0000	74.7181	74.7181	8.3000e-004	0.0000	74.7389
Total	**0.0278**	**0.3266**	**0.2018**	**1.8200e-003**	**0.1532**	**7.0000e-004**	**0.1539**	**0.0413**	**6.6000e-004**	**0.0420**	**0.0000**	**169.9523**	**169.9523**	**7.0600e-003**	**0.0000**	**170.1288**

3.6 Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0789	0.4059	0.9034	1.6000e-003		0.0189	0.0189		0.0189	0.0189	0.0000	137.3672	137.3672	6.4400e-003	0.0000	137.5282
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0789**	**0.4059**	**0.9034**	**1.6000e-003**		**0.0189**	**0.0189**		**0.0189**	**0.0189**	**0.0000**	**137.3672**	**137.3672**	**6.4400e-003**	**0.0000**	**137.5282**

3.6 Paving - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6500e-003	1.4100e-003	0.0180	8.0000e-005	0.0106	5.0000e-005	0.0107	2.8200e-003	5.0000e-005	2.8700e-003	0.0000	6.8388	6.8388	1.1000e-004	0.0000	6.8414
Total	**2.6500e-003**	**1.4100e-003**	**0.0180**	**8.0000e-005**	**0.0106**	**5.0000e-005**	**0.0107**	**2.8200e-003**	**5.0000e-005**	**2.8700e-003**	**0.0000**	**6.8388**	**6.8388**	**1.1000e-004**	**0.0000**	**6.8414**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0160	0.0693	0.9859	1.6000e-003		2.1300e-003	2.1300e-003		2.1300e-003	2.1300e-003	0.0000	137.3671	137.3671	6.4400e-003	0.0000	137.5281
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0160**	**0.0693**	**0.9859**	**1.6000e-003**		**2.1300e-003**	**2.1300e-003**		**2.1300e-003**	**2.1300e-003**	**0.0000**	**137.3671**	**137.3671**	**6.4400e-003**	**0.0000**	**137.5281**

3.6 Paving - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6500e-003	1.4100e-003	0.0180	8.0000e-005	0.0106	5.0000e-005	0.0107	2.8200e-003	5.0000e-005	2.8700e-003	0.0000	6.8388	6.8388	1.1000e-004	0.0000	6.8414
Total	**2.6500e-003**	**1.4100e-003**	**0.0180**	**8.0000e-005**	**0.0106**	**5.0000e-005**	**0.0107**	**2.8200e-003**	**5.0000e-005**	**2.8700e-003**	**0.0000**	**6.8388**	**6.8388**	**1.1000e-004**	**0.0000**	**6.8414**

3.6 Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0173	0.0890	0.1981	3.5000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0173**	**0.0890**	**0.1981**	**3.5000e-004**		**4.1300e-003**	**4.1300e-003**		**4.1300e-003**	**4.1300e-003**	**0.0000**	**30.1244**	**30.1244**	**1.4100e-003**	**0.0000**	**30.1597**

3.6 Paving - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	2.8000e-004	3.6700e-003	2.0000e-005	2.3300e-003	1.0000e-005	2.3400e-003	6.2000e-004	1.0000e-005	6.3000e-004	0.0000	1.4635	1.4635	2.0000e-005	0.0000	1.4640
Total	**5.3000e-004**	**2.8000e-004**	**3.6700e-003**	**2.0000e-005**	**2.3300e-003**	**1.0000e-005**	**2.3400e-003**	**6.2000e-004**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**1.4635**	**1.4635**	**2.0000e-005**	**0.0000**	**1.4640**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5100e-003	0.0152	0.2162	3.5000e-004		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.5100e-003**	**0.0152**	**0.2162**	**3.5000e-004**		**4.7000e-004**	**4.7000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**30.1244**	**30.1244**	**1.4100e-003**	**0.0000**	**30.1597**

3.6 Paving - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	2.8000e-004	3.6700e-003	2.0000e-005	2.3300e-003	1.0000e-005	2.3400e-003	6.2000e-004	1.0000e-005	6.3000e-004	0.0000	1.4635	1.4635	2.0000e-005	0.0000	1.4640
Total	**5.3000e-004**	**2.8000e-004**	**3.6700e-003**	**2.0000e-005**	**2.3300e-003**	**1.0000e-005**	**2.3400e-003**	**6.2000e-004**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**1.4635**	**1.4635**	**2.0000e-005**	**0.0000**	**1.4640**

3.7 Architectural Coating - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	19.5083					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4500e-003	0.0488	0.1025	1.7000e-004		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	14.5536	14.5536	5.9000e-004	0.0000	14.5683
Total	**19.5158**	**0.0488**	**0.1025**	**1.7000e-004**		**1.1600e-003**	**1.1600e-003**		**1.1600e-003**	**1.1600e-003**	**0.0000**	**14.5536**	**14.5536**	**5.9000e-004**	**0.0000**	**14.5683**

3.7 Architectural Coating - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0485	0.0259	0.3291	1.3800e-003	0.1947	9.4000e-004	0.1957	0.0518	8.6000e-004	0.0526	0.0000	125.3779	125.3779	1.9400e-003	0.0000	125.4264
Total	**0.0485**	**0.0259**	**0.3291**	**1.3800e-003**	**0.1947**	**9.4000e-004**	**0.1957**	**0.0518**	**8.6000e-004**	**0.0526**	**0.0000**	**125.3779**	**125.3779**	**1.9400e-003**	**0.0000**	**125.4264**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	19.5083					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6900e-003	7.3400e-003	0.1045	1.7000e-004		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	14.5535	14.5535	5.9000e-004	0.0000	14.5683
Total	**19.5100**	**7.3400e-003**	**0.1045**	**1.7000e-004**		**2.3000e-004**	**2.3000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**14.5535**	**14.5535**	**5.9000e-004**	**0.0000**	**14.5683**

3.7 Architectural Coating - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0485	0.0259	0.3291	1.3800e-003	0.1947	9.4000e-004	0.1957	0.0518	8.6000e-004	0.0526	0.0000	125.3779	125.3779	1.9400e-003	0.0000	125.4264
Total	**0.0485**	**0.0259**	**0.3291**	**1.3800e-003**	**0.1947**	**9.4000e-004**	**0.1957**	**0.0518**	**8.6000e-004**	**0.0526**	**0.0000**	**125.3779**	**125.3779**	**1.9400e-003**	**0.0000**	**125.4264**

3.7 Architectural Coating - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.2781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6300e-003	0.0107	0.0225	4.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004	0.0000	3.1916	3.1916	1.3000e-004	0.0000	3.1948
Total	**4.2798**	**0.0107**	**0.0225**	**4.0000e-005**		**2.5000e-004**	**2.5000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**3.1916**	**3.1916**	**1.3000e-004**	**0.0000**	**3.1948**

3.7 Architectural Coating - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6900e-003	5.1700e-003	0.0674	3.0000e-004	0.0427	1.9000e-004	0.0429	0.0114	1.8000e-004	0.0115	0.0000	26.8307	26.8307	3.9000e-004	0.0000	26.8404
Total	**9.6900e-003**	**5.1700e-003**	**0.0674**	**3.0000e-004**	**0.0427**	**1.9000e-004**	**0.0429**	**0.0114**	**1.8000e-004**	**0.0115**	**0.0000**	**26.8307**	**26.8307**	**3.9000e-004**	**0.0000**	**26.8404**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.2781					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7000e-004	1.6100e-003	0.0229	4.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	3.1916	3.1916	1.3000e-004	0.0000	3.1948
Total	**4.2785**	**1.6100e-003**	**0.0229**	**4.0000e-005**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**3.1916**	**3.1916**	**1.3000e-004**	**0.0000**	**3.1948**

3.7 Architectural Coating - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6900e-003	5.1700e-003	0.0674	3.0000e-004	0.0427	1.9000e-004	0.0429	0.0114	1.8000e-004	0.0115	0.0000	26.8307	26.8307	3.9000e-004	0.0000	26.8404
Total	**9.6900e-003**	**5.1700e-003**	**0.0674**	**3.0000e-004**	**0.0427**	**1.9000e-004**	**0.0429**	**0.0114**	**1.8000e-004**	**0.0115**	**0.0000**	**26.8307**	**26.8307**	**3.9000e-004**	**0.0000**	**26.8404**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.7334	57.6855	40.0789	0.3400	28.4362	0.1136	28.5498	7.6310	0.1065	7.7375	0.0000	31,704.89 81	31,704.89 81	1.6906	0.0000	31,747.16 21
Unmitigated	3.7334	57.6855	40.0789	0.3400	28.4362	0.1136	28.5498	7.6310	0.1065	7.7375	0.0000	31,704.89 81	31,704.89 81	1.6906	0.0000	31,747.16 21

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	8,621.89	1,632.84	841.16	25,158,587	25,158,587
Government Office Building	26,262.33	0.00	0.00	37,150,253	37,150,253
Office Park	2,820.74	405.08	187.72	6,079,047	6,079,047
Refrigerated Warehouse-No Rail	1,663.20	1,663.20	1663.20	6,425,717	6,425,717
City Park	24.57	295.75	217.62	224,150	224,150
Total	39,392.73	3,996.87	2,909.70	75,037,753	75,037,753

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Government Office Building	14.70	6.60	6.60	33.00	62.00	5.00	50	34	16
Office Park	14.70	6.60	6.60	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No	14.70	6.60	6.60	59.00	0.00	41.00	92	5	3
City Park	14.70	6.60	6.60	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Government Office Building	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.1972	1.7923	1.5056	0.0108		0.1362	0.1362		0.1362	0.1362	0.0000	1,951.162 3	1,951.162 3	0.0374	0.0358	1,962.757 1
NaturalGas Unmitigated	0.1972	1.7923	1.5056	0.0108		0.1362	0.1362		0.1362	0.1362	0.0000	1,951.162 3	1,951.162 3	0.0374	0.0358	1,962.757 1

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	2.58162e+007	0.1392	1.2655	1.0630	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.6502	1,377.6502	0.0264	0.0253	1,385.8369
Government Office Building	4.97205e+006	0.0268	0.2437	0.2047	1.4600e-003		0.0185	0.0185		0.0185	0.0185	0.0000	265.3275	265.3275	5.0900e-003	4.8600e-003	266.9042
Office Park	5.62666e+006	0.0303	0.2758	0.2317	1.6500e-003		0.0210	0.0210		0.0210	0.0210	0.0000	300.2600	300.2600	5.7500e-003	5.5000e-003	302.0443
Refrigerated Warehouse-No Rail	148500	8.0000e-004	7.2800e-003	6.1100e-003	4.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	7.9245	7.9245	1.5000e-004	1.5000e-004	7.9716
Total		**0.1972**	**1.7923**	**1.5056**	**0.0107**		**0.1362**	**0.1362**		**0.1362**	**0.1362**	**0.0000**	**1,951.1623**	**1,951.1623**	**0.0374**	**0.0358**	**1,962.7571**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Light Industry	2.58162e+007	0.1392	1.2655	1.0630	7.5900e-003		0.0962	0.0962		0.0962	0.0962	0.0000	1,377.6502	1,377.6502	0.0264	0.0253	1,385.8369
Government Office Building	4.97205e+006	0.0268	0.2437	0.2047	1.4600e-003		0.0185	0.0185		0.0185	0.0185	0.0000	265.3275	265.3275	5.0900e-003	4.8600e-003	266.9042
Office Park	5.62666e+006	0.0303	0.2758	0.2317	1.6500e-003		0.0210	0.0210		0.0210	0.0210	0.0000	300.2600	300.2600	5.7500e-003	5.5000e-003	302.0443
Refrigerated Warehouse-No Rail	148500	8.0000e-004	7.2800e-003	6.1100e-003	4.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	7.9245	7.9245	1.5000e-004	1.5000e-004	7.9716
Total		**0.1972**	**1.7923**	**1.5056**	**0.0107**		**0.1362**	**0.1362**		**0.1362**	**0.1362**	**0.0000**	**1,951.1623**	**1,951.1623**	**0.0374**	**0.0358**	**1,962.7571**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
General Light Industry	1.09103e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	3.47472e +006	0.0000	0.0000	0.0000	0.0000
Office Park	2.88002e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	2.46609e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
General Light Industry	1.09103e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	3.47472e +006	0.0000	0.0000	0.0000	0.0000
Office Park	2.88002e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	2.46609e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Crows Landing_Phase 2 - Stanislaus County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	15.7429	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546
Unmitigated	15.7429	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.3786					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	13.3618					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-003	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546
Total	**15.7429**	**2.4000e-004**	**0.0262**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0513**	**0.0513**	**1.3000e-004**	**0.0000**	**0.0546**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.3786					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	13.3618					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-003	2.4000e-004	0.0262	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	0.0513	0.0513	1.3000e-004	0.0000	0.0546
Total	**15.7429**	**2.4000e-004**	**0.0262**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0513**	**0.0513**	**1.3000e-004**	**0.0000**	**0.0546**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	201.3240	20.6779	0.4883	863.7702
Unmitigated	201.3240	20.6779	0.4883	863.7702

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 15.4893	0.0000	0.0000	0.0000	0.0000
General Light Industry	286.056 / 0	90.7525	9.3212	0.2201	389.3687
Government Office Building	75.6893 / 46.3902	24.0127	2.4663	0.0582	103.0254
Office Park	43.9002 / 26.9066	13.9275	1.4305	0.0338	59.7553
Refrigerated Warehouse-No Rail	228.938 / 0	72.6313	7.4599	0.1762	311.6209
Total		**201.3240**	**20.6779**	**0.4883**	**863.7702**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 15.4893	0.0000	0.0000	0.0000	0.0000
General Light Industry	286.056 / 0	90.7525	9.3212	0.2201	389.3687
Government Office Building	75.6893 / 46.3902	24.0127	2.4663	0.0582	103.0254
Office Park	43.9002 / 26.9066	13.9275	1.4305	0.0338	59.7553
Refrigerated Warehouse-No Rail	228.938 / 0	72.6313	7.4599	0.1762	311.6209
Total		**201.3240**	**20.6779**	**0.4883**	**863.7702**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	619.0494	36.5848	0.0000	1,533.668 6
Unmitigated	619.0494	36.5848	0.0000	1,533.668 6

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.12	0.2274	0.0134	0.0000	0.5633
General Light Industry	1533.88	311.3638	18.4011	0.0000	771.3906
Government Office Building	354.33	71.9258	4.2507	0.0000	178.1931
Office Park	229.71	46.6291	2.7557	0.0000	115.5215
Refrigerated Warehouse-No Rail	930.6	188.9034	11.1639	0.0000	468.0002
Total		**619.0494**	**36.5848**	**0.0000**	**1,533.668 6**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.12	0.2274	0.0134	0.0000	0.5633
General Light Industry	1533.88	311.3638	18.4011	0.0000	771.3906
Government Office Building	354.33	71.9258	4.2507	0.0000	178.1931
Office Park	229.71	46.6291	2.7557	0.0000	115.5215
Refrigerated Warehouse-No Rail	930.6	188.9034	11.1639	0.0000	468.0002
Total		**619.0494**	**36.5848**	**0.0000**	**1,533.668 6**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Crows Landing_Phase 3

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	196.00	1000sqft	18.00	196,000.00	0
Office Park	446.00	1000sqft	26.00	446,000.00	0
General Light Industry	2,230.00	1000sqft	128.00	2,230,000.00	0
Refrigerated Warehouse-No Rail	1,784.00	1000sqft	102.00	1,784,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Crows Landing_Phase 3 - Stanislaus County, Annual

Project Characteristics -

Land Use - PD

Construction Phase - Assumes infrastructure is front-loaded

Grading - Total acreage

Construction Off-road Equipment Mitigation - Potential Tier 4 mitigation

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Trenching

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Vehicle Trips -

Area Coating -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	465.00	196.00
tblConstructionPhase	NumDays	180.00	76.00
tblConstructionPhase	NumDays	4,650.00	1,956.00
tblConstructionPhase	NumDays	330.00	139.00
tblConstructionPhase	NumDays	330.00	139.00
tblConstructionPhase	PhaseEndDate	6/21/2041	10/10/2039
tblConstructionPhase	PhaseEndDate	6/21/2041	4/17/2040
tblConstructionPhase	PhaseEndDate	9/9/2039	8/1/2040
tblConstructionPhase	PhaseEndDate	4/18/2059	1/30/2048
tblConstructionPhase	PhaseEndDate	7/23/2060	2/12/2041
tblConstructionPhase	PhaseEndDate	10/28/2061	2/12/2041

tblConstructionPhase	PhaseStartDate	9/10/2039	1/10/2039
tblConstructionPhase	PhaseStartDate	6/22/2041	10/11/2039
tblConstructionPhase	PhaseStartDate	1/1/2039	4/18/2040
tblConstructionPhase	PhaseStartDate	6/22/2041	8/2/2040
tblConstructionPhase	PhaseStartDate	4/19/2059	8/2/2040
tblConstructionPhase	PhaseStartDate	7/24/2060	8/2/2040
tblGrading	AcresOfGrading	490.00	274.00
tblGrading	AcresOfGrading	0.00	274.00
tblLandUse	LotAcreage	4.50	18.00
tblLandUse	LotAcreage	10.24	26.00
tblLandUse	LotAcreage	51.19	128.00
tblLandUse	LotAcreage	40.96	102.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2039	0.3523	1.2412	2.7049	8.3600e-003	0.7554	0.0395	0.7948	0.3454	0.0395	0.3848	0.0000	771.0191	771.0191	0.0279	0.0000	771.7177
2040	25.6782	4.5869	4.7974	0.0250	2.1235	0.0379	2.1614	0.7424	0.0376	0.7799	0.0000	2,269.1118	2,269.1118	0.0913	0.0000	2,271.3954
2041	7.8236	8.6833	5.6132	0.0427	2.6787	0.0239	2.7026	0.7271	0.0232	0.7503	0.0000	3,959.0172	3,959.0172	0.1701	0.0000	3,963.2699
2042	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2043	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2044	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2045	0.5415	8.5218	5.0990	0.0415	2.6200	0.0210	2.6409	0.7115	0.0203	0.7318	0.0000	3,852.8489	3,852.8489	0.1641	0.0000	3,856.9514
2046	0.5436	8.5546	5.1186	0.0417	2.6300	0.0211	2.6511	0.7142	0.0204	0.7346	0.0000	3,867.6676	3,867.6676	0.1647	0.0000	3,871.7858
2047	0.5436	8.5546	5.1186	0.0417	2.6300	0.0211	2.6511	0.7142	0.0204	0.7346	0.0000	3,867.6676	3,867.6676	0.1647	0.0000	3,871.7858
2048	0.0458	0.7211	0.4315	3.5100e-003	0.2217	1.7800e-003	0.2235	0.0602	1.7200e-003	0.0619	0.0000	326.0103	326.0103	0.0139	0.0000	326.3574
Maximum	**25.6782**	**8.6833**	**5.6132**	**0.0427**	**2.6787**	**0.0395**	**2.7026**	**0.7424**	**0.0395**	**0.7799**	**0.0000**	**3,959.0172**	**3,959.0172**	**0.1701**	**0.0000**	**3,963.2699**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2039	0.0920	0.3848	3.8758	8.3600e-003	0.3509	0.0119	0.3627	0.1583	0.0119	0.1702	0.0000	771.0182	771.0182	0.0279	0.0000	771.7168
2040	25.4341	3.6049	5.5349	0.0250	1.6660	0.0164	1.6824	0.5262	0.0160	0.5422	0.0000	2,269.1110	2,269.1110	0.0913	0.0000	2,271.3946
2041	7.6976	8.0287	5.8118	0.0427	2.6787	0.0183	2.6970	0.7271	0.0176	0.7447	0.0000	3,959.0167	3,959.0167	0.1701	0.0000	3,963.2694
2042	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2043	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2044	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2045	0.4285	7.9166	5.2735	0.0415	2.6200	0.0167	2.6367	0.7115	0.0160	0.7275	0.0000	3,852.8485	3,852.8485	0.1641	0.0000	3,856.9510
2046	0.4301	7.9470	5.2937	0.0417	2.6300	0.0168	2.6468	0.7142	0.0161	0.7303	0.0000	3,867.6671	3,867.6671	0.1647	0.0000	3,871.7854
2047	0.4301	7.9470	5.2937	0.0417	2.6300	0.0168	2.6468	0.7142	0.0161	0.7303	0.0000	3,867.6671	3,867.6671	0.1647	0.0000	3,871.7854
2048	0.0363	0.6699	0.4462	3.5100e-003	0.2217	1.4100e-003	0.2231	0.0602	1.3600e-003	0.0616	0.0000	326.0103	326.0103	0.0139	0.0000	326.3574
Maximum	**25.4341**	**8.0287**	**5.8118**	**0.0427**	**2.6787**	**0.0183**	**2.6970**	**0.7271**	**0.0176**	**0.7447**	**0.0000**	**3,959.0167**	**3,959.0167**	**0.1701**	**0.0000**	**3,963.2694**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**3.54**	**9.28**	**-7.09**	**0.00**	**4.00**	**34.90**	**4.33**	**6.55**	**35.72**	**7.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Crows Landing_Phase 3 - Stanislaus County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2039	3-31-2039	0.3631	0.1189
2	4-1-2039	6-30-2039	0.4079	0.1335
3	7-1-2039	9-30-2039	0.4124	0.1350
4	10-1-2039	12-31-2039	0.4060	0.0886
5	1-1-2040	3-31-2040	0.3248	0.0818
6	4-1-2040	6-30-2040	0.4730	0.1274
7	7-1-2040	9-30-2040	11.7950	11.4641
8	10-1-2040	12-31-2040	17.8246	17.5164
9	1-1-2041	3-31-2041	9.5145	9.2778
10	4-1-2041	6-30-2041	2.2801	2.1006
11	7-1-2041	9-30-2041	2.3052	2.1237
12	10-1-2041	12-31-2041	2.3166	2.1351
13	1-1-2042	3-31-2042	2.2662	2.0886
14	4-1-2042	6-30-2042	2.2801	2.1006
15	7-1-2042	9-30-2042	2.3052	2.1237
16	10-1-2042	12-31-2042	2.3166	2.1351
17	1-1-2043	3-31-2043	2.2662	2.0886
18	4-1-2043	6-30-2043	2.2801	2.1006
19	7-1-2043	9-30-2043	2.3052	2.1237
20	10-1-2043	12-31-2043	2.3166	2.1351
21	1-1-2044	3-31-2044	2.2914	2.1119
22	4-1-2044	6-30-2044	2.2801	2.1006
23	7-1-2044	9-30-2044	2.3052	2.1237
24	10-1-2044	12-31-2044	2.3166	2.1351
25	1-1-2045	3-31-2045	2.2424	2.0648
26	4-1-2045	6-30-2045	2.2560	2.0764

27	**7-1-2045**	**9-30-2045**	2.2807	2.0992
28	**10-1-2045**	**12-31-2045**	2.2922	2.1107
29	**1-1-2046**	**3-31-2046**	2.2424	2.0648
30	**4-1-2046**	**6-30-2046**	2.2560	2.0764
31	**7-1-2046**	**9-30-2046**	2.2807	2.0992
32	**10-1-2046**	**12-31-2046**	2.2922	2.1107
33	**1-1-2047**	**3-31-2047**	2.2424	2.0648
34	**4-1-2047**	**6-30-2047**	2.2560	2.0764
35	**7-1-2047**	**9-30-2047**	2.2807	2.0992
36	**10-1-2047**	**12-31-2047**	2.2922	2.1107
37	**1-1-2048**	**3-31-2048**	0.7475	0.6883
		Highest	17.8246	17.5164

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Energy	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.5010	3,176.5010	0.0609	0.0582	3,195.3773
Mobile	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044
Waste						0.0000	0.0000		0.0000	0.0000	1,022.9161	0.0000	1,022.9161	60.4526	0.0000	2,534.2314
Water						0.0000	0.0000		0.0000	0.0000	331.9884	0.0000	331.9884	34.0984	0.8051	1,424.3791
Total	**25.2746**	**58.0274**	**39.7562**	**0.3331**	**26.1759**	**0.3270**	**26.5030**	**7.0245**	**0.3205**	**7.3449**	**1,354.9045**	**32,609.3107**	**33,964.2152**	**96.2312**	**0.8634**	**36,627.2808**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Energy	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.501 0	3,176.501 0	0.0609	0.0582	3,195.377 3
Mobile	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.72 65	29,432.72 65	1.6191	0.0000	29,473.20 44
Waste						0.0000	0.0000		0.0000	0.0000	1,022.916 1	0.0000	1,022.916 1	60.4526	0.0000	2,534.231 4
Water						0.0000	0.0000		0.0000	0.0000	331.9884	0.0000	331.9884	34.0984	0.8051	1,424.379 1
Total	**25.2746**	**58.0274**	**39.7562**	**0.3331**	**26.1759**	**0.3270**	**26.5030**	**7.0245**	**0.3205**	**7.3449**	**1,354.904 5**	**32,609.31 07**	**33,964.21 52**	**96.2312**	**0.8634**	**36,627.28 08**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/18/2040	8/1/2040	5	76	
2	Grading	Grading	1/10/2039	10/10/2039	5	196	
3	Trenching	Trenching	10/11/2039	4/17/2040	5	136	
4	Building Construction	Building Construction	8/2/2040	1/30/2048	5	1956	
5	Paving	Paving	8/2/2040	2/12/2041	5	139	
6	Architectural Coating	Architectural Coating	8/2/2040	2/12/2041	5	139	

Acres of Grading (Site Preparation Phase): 274

Acres of Grading (Grading Phase): 274

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,984,000; Non-Residential Outdoor: 2,328,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Crows Landing_Phase 3 - Stanislaus County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Rubber Tired Dozers	3	8.00	247	0.40
Trenching	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Crows Landing_Phase 3 - Stanislaus County, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	1,891.00	763.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	378.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8318	0.0000	0.8318	0.3931	0.0000	0.3931	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1250	0.4647	0.8430	2.9600e-003		0.0139	0.0139		0.0139	0.0139	0.0000	254.4314	254.4314	9.8500e-003	0.0000	254.6776
Total	**0.1250**	**0.4647**	**0.8430**	**2.9600e-003**	**0.8318**	**0.0139**	**0.8457**	**0.3931**	**0.0139**	**0.4069**	**0.0000**	**254.4314**	**254.4314**	**9.8500e-003**	**0.0000**	**254.6776**

3.2 Site Preparation - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0100e-003	1.1300e-003	0.0166	9.0000e-005	0.0283	4.0000e-005	0.0284	7.2600e-003	4.0000e-005	7.3000e-003	0.0000	8.5316	8.5316	8.0000e-005	0.0000	8.5335
Total	**2.0100e-003**	**1.1300e-003**	**0.0166**	**9.0000e-005**	**0.0283**	**4.0000e-005**	**0.0284**	**7.2600e-003**	**4.0000e-005**	**7.3000e-003**	**0.0000**	**8.5316**	**8.5316**	**8.0000e-005**	**0.0000**	**8.5335**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3743	0.0000	0.3743	0.1769	0.0000	0.1769	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.1283	1.2301	2.9600e-003		3.9500e-003	3.9500e-003		3.9500e-003	3.9500e-003	0.0000	254.4311	254.4311	9.8500e-003	0.0000	254.6773
Total	**0.0296**	**0.1283**	**1.2301**	**2.9600e-003**	**0.3743**	**3.9500e-003**	**0.3783**	**0.1769**	**3.9500e-003**	**0.1808**	**0.0000**	**254.4311**	**254.4311**	**9.8500e-003**	**0.0000**	**254.6773**

3.2 Site Preparation - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0100e-003	1.1300e-003	0.0166	9.0000e-005	0.0283	4.0000e-005	0.0284	7.2600e-003	4.0000e-005	7.3000e-003	0.0000	8.5316	8.5316	8.0000e-005	0.0000	8.5335
Total	**2.0100e-003**	**1.1300e-003**	**0.0166**	**9.0000e-005**	**0.0283**	**4.0000e-005**	**0.0284**	**7.2600e-003**	**4.0000e-005**	**7.3000e-003**	**0.0000**	**8.5316**	**8.5316**	**8.0000e-005**	**0.0000**	**8.5335**

3.3 Grading - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.7355	0.0000	0.7355	0.3401	0.0000	0.3401	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2853	0.9402	2.2075	6.8500e-003		0.0308	0.0308		0.0308	0.0308	0.0000	641.2755	641.2755	0.0228	0.0000	641.8444
Total	**0.2853**	**0.9402**	**2.2075**	**6.8500e-003**	**0.7355**	**0.0308**	**0.7662**	**0.3401**	**0.0308**	**0.3709**	**0.0000**	**641.2755**	**641.2755**	**0.0228**	**0.0000**	**641.8444**

3.3 Grading - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8400e-003	1.4600e-003	0.0207	1.0000e-004	0.0157	6.0000e-005	0.0157	4.1600e-003	5.0000e-005	4.2100e-003	0.0000	9.2296	9.2296	1.1000e-004	0.0000	9.2322
Total	**2.8400e-003**	**1.4600e-003**	**0.0207**	**1.0000e-004**	**0.0157**	**6.0000e-005**	**0.0157**	**4.1600e-003**	**5.0000e-005**	**4.2100e-003**	**0.0000**	**9.2296**	**9.2296**	**1.1000e-004**	**0.0000**	**9.2322**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3310	0.0000	0.3310	0.1530	0.0000	0.1530	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0746	0.3234	3.2339	6.8500e-003		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	641.2748	641.2748	0.0228	0.0000	641.8436
Total	**0.0746**	**0.3234**	**3.2339**	**6.8500e-003**	**0.3310**	**9.9500e-003**	**0.3409**	**0.1530**	**9.9500e-003**	**0.1630**	**0.0000**	**641.2748**	**641.2748**	**0.0228**	**0.0000**	**641.8436**

3.3 Grading - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8400e-003	1.4600e-003	0.0207	1.0000e-004	0.0157	6.0000e-005	0.0157	4.1600e-003	5.0000e-005	4.2100e-003	0.0000	9.2296	9.2296	1.1000e-004	0.0000	9.2322
Total	**2.8400e-003**	**1.4600e-003**	**0.0207**	**1.0000e-004**	**0.0157**	**6.0000e-005**	**0.0157**	**4.1600e-003**	**5.0000e-005**	**4.2100e-003**	**0.0000**	**9.2296**	**9.2296**	**1.1000e-004**	**0.0000**	**9.2322**

3.4 Trenching - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0634	0.2991	0.4712	1.3700e-003		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	118.0136	118.0136	5.0600e-003	0.0000	118.1400
Total	**0.0634**	**0.2991**	**0.4712**	**1.3700e-003**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**118.0136**	**118.0136**	**5.0600e-003**	**0.0000**	**118.1400**

3.4 Trenching - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	3.9000e-004	5.5900e-003	3.0000e-005	4.2400e-003	2.0000e-005	4.2600e-003	1.1300e-003	1.0000e-005	1.1400e-003	0.0000	2.5005	2.5005	3.0000e-005	0.0000	2.5012
Total	**7.7000e-004**	**3.9000e-004**	**5.5900e-003**	**3.0000e-005**	**4.2400e-003**	**2.0000e-005**	**4.2600e-003**	**1.1300e-003**	**1.0000e-005**	**1.1400e-003**	**0.0000**	**2.5005**	**2.5005**	**3.0000e-005**	**0.0000**	**2.5012**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0137	0.0595	0.6156	1.3700e-003		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003	0.0000	118.0135	118.0135	5.0600e-003	0.0000	118.1399
Total	**0.0137**	**0.0595**	**0.6156**	**1.3700e-003**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**	**0.0000**	**118.0135**	**118.0135**	**5.0600e-003**	**0.0000**	**118.1399**

3.4 Trenching - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	3.9000e-004	5.5900e-003	3.0000e-005	4.2400e-003	2.0000e-005	4.2600e-003	1.1300e-003	1.0000e-005	1.1400e-003	0.0000	2.5005	2.5005	3.0000e-005	0.0000	2.5012
Total	**7.7000e-004**	**3.9000e-004**	**5.5900e-003**	**3.0000e-005**	**4.2400e-003**	**2.0000e-005**	**4.2600e-003**	**1.1300e-003**	**1.0000e-005**	**1.1400e-003**	**0.0000**	**2.5005**	**2.5005**	**3.0000e-005**	**0.0000**	**2.5012**

3.4 Trenching - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0757	0.3078	0.6075	1.7900e-003		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	154.0178	154.0178	5.9600e-003	0.0000	154.1668
Total	**0.0757**	**0.3078**	**0.6075**	**1.7900e-003**		**7.8000e-003**	**7.8000e-003**		**7.8000e-003**	**7.8000e-003**	**0.0000**	**154.0178**	**154.0178**	**5.9600e-003**	**0.0000**	**154.1668**

3.4 Trenching - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	4.1000e-004	6.0600e-003	3.0000e-005	5.5400e-003	1.0000e-005	5.5500e-003	1.4700e-003	1.0000e-005	1.4900e-003	0.0000	3.1118	3.1118	3.0000e-005	0.0000	3.1125
Total	**7.3000e-004**	**4.1000e-004**	**6.0600e-003**	**3.0000e-005**	**5.5400e-003**	**1.0000e-005**	**5.5500e-003**	**1.4700e-003**	**1.0000e-005**	**1.4900e-003**	**0.0000**	**3.1118**	**3.1118**	**3.0000e-005**	**0.0000**	**3.1125**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0179	0.0777	0.8035	1.7900e-003		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	154.0176	154.0176	5.9600e-003	0.0000	154.1666
Total	**0.0179**	**0.0777**	**0.8035**	**1.7900e-003**		**2.3900e-003**	**2.3900e-003**		**2.3900e-003**	**2.3900e-003**	**0.0000**	**154.0176**	**154.0176**	**5.9600e-003**	**0.0000**	**154.1666**

3.4 Trenching - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	4.1000e-004	6.0600e-003	3.0000e-005	5.5400e-003	1.0000e-005	5.5500e-003	1.4700e-003	1.0000e-005	1.4900e-003	0.0000	3.1118	3.1118	3.0000e-005	0.0000	3.1125
Total	**7.3000e-004**	**4.1000e-004**	**6.0600e-003**	**3.0000e-005**	**5.5400e-003**	**1.0000e-005**	**5.5500e-003**	**1.4700e-003**	**1.0000e-005**	**1.4900e-003**	**0.0000**	**3.1118**	**3.1118**	**3.0000e-005**	**0.0000**	**3.1125**

3.5 Building Construction - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0646	0.3721	0.8704	1.6700e-003		3.9800e-003	3.9800e-003		3.9800e-003	3.9800e-003	0.0000	141.9450	141.9450	5.1000e-003	0.0000	142.0725
Total	**0.0646**	**0.3721**	**0.8704**	**1.6700e-003**		**3.9800e-003**	**3.9800e-003**		**3.9800e-003**	**3.9800e-003**	**0.0000**	**141.9450**	**141.9450**	**5.1000e-003**	**0.0000**	**142.0725**

3.5 Building Construction - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0676	3.1305	0.4242	0.0106	0.2724	2.8600e-003	0.2753	0.0787	2.7300e-003	0.0814	0.0000	1,009.3331	1,009.3331	0.0605	0.0000	1,010.8452
Worker	0.1079	0.0609	0.8932	5.0600e-003	0.8159	2.2000e-003	0.8181	0.2169	2.0300e-003	0.2189	0.0000	458.5231	458.5231	4.1300e-003	0.0000	458.6262
Total	**0.1755**	**3.1914**	**1.3173**	**0.0157**	**1.0883**	**5.0600e-003**	**1.0934**	**0.2955**	**4.7600e-003**	**0.3003**	**0.0000**	**1,467.8561**	**1,467.8561**	**0.0646**	**0.0000**	**1,469.4714**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0177	0.1207	0.9429	1.6700e-003		2.2000e-003	2.2000e-003		2.2000e-003	2.2000e-003	0.0000	141.9448	141.9448	5.1000e-003	0.0000	142.0723
Total	**0.0177**	**0.1207**	**0.9429**	**1.6700e-003**		**2.2000e-003**	**2.2000e-003**		**2.2000e-003**	**2.2000e-003**	**0.0000**	**141.9448**	**141.9448**	**5.1000e-003**	**0.0000**	**142.0723**

3.5 Building Construction - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0676	3.1305	0.4242	0.0106	0.2724	2.8600e-003	0.2753	0.0787	2.7300e-003	0.0814	0.0000	1,009.333 1	1,009.333 1	0.0605	0.0000	1,010.845 2
Worker	0.1079	0.0609	0.8932	5.0600e-003	0.8159	2.2000e-003	0.8181	0.2169	2.0300e-003	0.2189	0.0000	458.5231	458.5231	4.1300e-003	0.0000	458.6262
Total	**0.1755**	**3.1914**	**1.3173**	**0.0157**	**1.0883**	**5.0600e-003**	**1.0934**	**0.2955**	**4.7600e-003**	**0.3003**	**0.0000**	**1,467.856 1**	**1,467.856 1**	**0.0646**	**0.0000**	**1,469.471 4**

3.5 Building Construction - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

Crows Landing_Phase 3 - Stanislaus County, Annual

3.5 Building Construction - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2043

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2043

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2043

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2044

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2044

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2044

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2045

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1556	0.8957	2.0954	4.0200e-003		9.5800e-003	9.5800e-003		9.5800e-003	9.5800e-003	0.0000	341.7194	341.7194	0.0123	0.0000	342.0264
Total	**0.1556**	**0.8957**	**2.0954**	**4.0200e-003**		**9.5800e-003**	**9.5800e-003**		**9.5800e-003**	**9.5800e-003**	**0.0000**	**341.7194**	**341.7194**	**0.0123**	**0.0000**	**342.0264**

3.5 Building Construction - 2045

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1626	7.4917	1.0186	0.0255	0.6558	6.8300e-003	0.6627	0.1894	6.5300e-003	0.1959	0.0000	2,427.1760	2,427.1760	0.1429	0.0000	2,430.7485
Worker	0.2233	0.1344	1.9850	0.0120	1.9641	4.5700e-003	1.9687	0.5221	4.2000e-003	0.5263	0.0000	1,083.9535	1,083.9535	8.9200e-003	0.0000	1,084.1765
Total	**0.3859**	**7.6261**	**3.0036**	**0.0375**	**2.6200**	**0.0114**	**2.6314**	**0.7115**	**0.0107**	**0.7222**	**0.0000**	**3,511.1295**	**3,511.1295**	**0.1518**	**0.0000**	**3,514.9250**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	4.0200e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	341.7190	341.7190	0.0123	0.0000	342.0260
Total	**0.0426**	**0.2905**	**2.2698**	**4.0200e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**341.7190**	**341.7190**	**0.0123**	**0.0000**	**342.0260**

3.5 Building Construction - 2045

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1626	7.4917	1.0186	0.0255	0.6558	6.8300e-003	0.6627	0.1894	6.5300e-003	0.1959	0.0000	2,427.1760	2,427.1760	0.1429	0.0000	2,430.7485
Worker	0.2233	0.1344	1.9850	0.0120	1.9641	4.5700e-003	1.9687	0.5221	4.2000e-003	0.5263	0.0000	1,083.9535	1,083.9535	8.9200e-003	0.0000	1,084.1765
Total	**0.3859**	**7.6261**	**3.0036**	**0.0375**	**2.6200**	**0.0114**	**2.6314**	**0.7115**	**0.0107**	**0.7222**	**0.0000**	**3,511.1295**	**3,511.1295**	**0.1518**	**0.0000**	**3,514.9250**

3.5 Building Construction - 2046

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2046

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2046

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

3.5 Building Construction - 2047

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2047

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2047

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.511 3	2,436.511 3	0.1435	0.0000	2,440.097 5
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.122 5	1,088.122 5	8.9600e-003	0.0000	1,088.346 4
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.633 9**	**3,524.633 9**	**0.1524**	**0.0000**	**3,528.444 0**

3.5 Building Construction - 2048

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0132	0.0758	0.1773	3.4000e-004		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	28.9147	28.9147	1.0400e-003	0.0000	28.9407
Total	**0.0132**	**0.0758**	**0.1773**	**3.4000e-004**		**8.1000e-004**	**8.1000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**28.9147**	**28.9147**	**1.0400e-003**	**0.0000**	**28.9407**

3.5 Building Construction - 2048

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0138	0.6339	0.0862	2.1600e-003	0.0555	5.8000e-004	0.0561	0.0160	5.5000e-004	0.0166	0.0000	205.3764	205.3764	0.0121	0.0000	205.6787
Worker	0.0189	0.0114	0.1680	1.0100e-003	0.1662	3.9000e-004	0.1666	0.0442	3.6000e-004	0.0445	0.0000	91.7191	91.7191	7.5000e-004	0.0000	91.7380
Total	**0.0327**	**0.6453**	**0.2542**	**3.1700e-003**	**0.2217**	**9.7000e-004**	**0.2227**	**0.0602**	**9.1000e-004**	**0.0611**	**0.0000**	**297.0956**	**297.0956**	**0.0128**	**0.0000**	**297.4167**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6100e-003	0.0246	0.1921	3.4000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	28.9147	28.9147	1.0400e-003	0.0000	28.9407
Total	**3.6100e-003**	**0.0246**	**0.1921**	**3.4000e-004**		**4.5000e-004**	**4.5000e-004**		**4.5000e-004**	**4.5000e-004**	**0.0000**	**28.9147**	**28.9147**	**1.0400e-003**	**0.0000**	**28.9407**

3.5 Building Construction - 2048

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0138	0.6339	0.0862	2.1600e-003	0.0555	5.8000e-004	0.0561	0.0160	5.5000e-004	0.0166	0.0000	205.3764	205.3764	0.0121	0.0000	205.6787
Worker	0.0189	0.0114	0.1680	1.0100e-003	0.1662	3.9000e-004	0.1666	0.0442	3.6000e-004	0.0445	0.0000	91.7191	91.7191	7.5000e-004	0.0000	91.7380
Total	**0.0327**	**0.6453**	**0.2542**	**3.1700e-003**	**0.2217**	**9.7000e-004**	**0.2227**	**0.0602**	**9.1000e-004**	**0.0611**	**0.0000**	**297.0956**	**297.0956**	**0.0128**	**0.0000**	**297.4167**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.1975	0.8542	1.5100e-003		6.2900e-003	6.2900e-003		6.2900e-003	6.2900e-003	0.0000	130.1374	130.1374	4.3700e-003	0.0000	130.2467
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0546**	**0.1975**	**0.8542**	**1.5100e-003**		**6.2900e-003**	**6.2900e-003**		**6.2900e-003**	**6.2900e-003**	**0.0000**	**130.1374**	**130.1374**	**4.3700e-003**	**0.0000**	**130.2467**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	4.8000e-004	7.0800e-003	4.0000e-005	6.4700e-003	2.0000e-005	6.4900e-003	1.7200e-003	2.0000e-005	1.7400e-003	0.0000	3.6372	3.6372	3.0000e-005	0.0000	3.6380
Total	**8.6000e-004**	**4.8000e-004**	**7.0800e-003**	**4.0000e-005**	**6.4700e-003**	**2.0000e-005**	**6.4900e-003**	**1.7200e-003**	**2.0000e-005**	**1.7400e-003**	**0.0000**	**3.6372**	**3.6372**	**3.0000e-005**	**0.0000**	**3.6380**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0152	0.0656	0.9340	1.5100e-003		2.0200e-003	2.0200e-003		2.0200e-003	2.0200e-003	0.0000	130.1372	130.1372	4.3700e-003	0.0000	130.2466
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0152**	**0.0656**	**0.9340**	**1.5100e-003**		**2.0200e-003**	**2.0200e-003**		**2.0200e-003**	**2.0200e-003**	**0.0000**	**130.1372**	**130.1372**	**4.3700e-003**	**0.0000**	**130.2466**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	4.8000e-004	7.0800e-003	4.0000e-005	6.4700e-003	2.0000e-005	6.4900e-003	1.7200e-003	2.0000e-005	1.7400e-003	0.0000	3.6372	3.6372	3.0000e-005	0.0000	3.6380
Total	**8.6000e-004**	**4.8000e-004**	**7.0800e-003**	**4.0000e-005**	**6.4700e-003**	**2.0000e-005**	**6.4900e-003**	**1.7200e-003**	**2.0000e-005**	**1.7400e-003**	**0.0000**	**3.6372**	**3.6372**	**3.0000e-005**	**0.0000**	**3.6380**

3.6 Paving - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.0567	0.2452	4.3000e-004		1.8000e-003	1.8000e-003		1.8000e-003	1.8000e-003	0.0000	37.3543	37.3543	1.2600e-003	0.0000	37.3856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0157**	**0.0567**	**0.2452**	**4.3000e-004**		**1.8000e-003**	**1.8000e-003**		**1.8000e-003**	**1.8000e-003**	**0.0000**	**37.3543**	**37.3543**	**1.2600e-003**	**0.0000**	**37.3856**

3.6 Paving - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.4000e-004	2.0300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8600e-003	4.9000e-004	0.0000	5.0000e-004	0.0000	1.0440	1.0440	1.0000e-005	0.0000	1.0442
Total	**2.5000e-004**	**1.4000e-004**	**2.0300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8600e-003**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**0.0000**	**1.0440**	**1.0440**	**1.0000e-005**	**0.0000**	**1.0442**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.3500e-003	0.0188	0.2681	4.3000e-004		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	37.3542	37.3542	1.2600e-003	0.0000	37.3856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.3500e-003**	**0.0188**	**0.2681**	**4.3000e-004**		**5.8000e-004**	**5.8000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**37.3542**	**37.3542**	**1.2600e-003**	**0.0000**	**37.3856**

3.6 Paving - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.4000e-004	2.0300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8600e-003	4.9000e-004	0.0000	5.0000e-004	0.0000	1.0440	1.0440	1.0000e-005	0.0000	1.0442
Total	**2.5000e-004**	**1.4000e-004**	**2.0300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8600e-003**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**0.0000**	**1.0440**	**1.0440**	**1.0000e-005**	**0.0000**	**1.0442**

3.7 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	25.1514					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-003	0.0393	0.0968	1.6000e-004		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	13.7876	13.7876	4.9000e-004	0.0000	13.7997
Total	**25.1576**	**0.0393**	**0.0968**	**1.6000e-004**		**4.0000e-004**	**4.0000e-004**		**4.0000e-004**	**4.0000e-004**	**0.0000**	**13.7876**	**13.7876**	**4.9000e-004**	**0.0000**	**13.7997**

3.7 Architectural Coating - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0216	0.0122	0.1785	1.0100e-003	0.1631	4.4000e-004	0.1635	0.0434	4.1000e-004	0.0438	0.0000	91.6561	91.6561	8.2000e-004	0.0000	91.6767
Total	**0.0216**	**0.0122**	**0.1785**	**1.0100e-003**	**0.1631**	**4.4000e-004**	**0.1635**	**0.0434**	**4.1000e-004**	**0.0438**	**0.0000**	**91.6561**	**91.6561**	**8.2000e-004**	**0.0000**	**91.6767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	25.1514					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	6.9500e-003	0.0990	1.6000e-004		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	13.7876	13.7876	4.9000e-004	0.0000	13.7997
Total	**25.1530**	**6.9500e-003**	**0.0990**	**1.6000e-004**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**13.7876**	**13.7876**	**4.9000e-004**	**0.0000**	**13.7997**

3.7 Architectural Coating - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0216	0.0122	0.1785	1.0100e-003	0.1631	4.4000e-004	0.1635	0.0434	4.1000e-004	0.0438	0.0000	91.6561	91.6561	8.2000e-004	0.0000	91.6767
Total	**0.0216**	**0.0122**	**0.1785**	**1.0100e-003**	**0.1631**	**4.4000e-004**	**0.1635**	**0.0434**	**4.1000e-004**	**0.0438**	**0.0000**	**91.6561**	**91.6561**	**8.2000e-004**	**0.0000**	**91.6767**

3.7 Architectural Coating - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.2194					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7800e-003	0.0113	0.0278	5.0000e-005		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	3.9575	3.9575	1.4000e-004	0.0000	3.9610
Total	**7.2212**	**0.0113**	**0.0278**	**5.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**3.9575**	**3.9575**	**1.4000e-004**	**0.0000**	**3.9610**

3.7 Architectural Coating - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1900e-003	3.4900e-003	0.0513	2.9000e-004	0.0468	1.3000e-004	0.0469	0.0124	1.2000e-004	0.0126	0.0000	26.3087	26.3087	2.4000e-004	0.0000	26.3146
Total	**6.1900e-003**	**3.4900e-003**	**0.0513**	**2.9000e-004**	**0.0468**	**1.3000e-004**	**0.0469**	**0.0124**	**1.2000e-004**	**0.0126**	**0.0000**	**26.3087**	**26.3087**	**2.4000e-004**	**0.0000**	**26.3146**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.2194					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6000e-004	2.0000e-003	0.0284	5.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	3.9575	3.9575	1.4000e-004	0.0000	3.9610
Total	**7.2199**	**2.0000e-003**	**0.0284**	**5.0000e-005**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**3.9575**	**3.9575**	**1.4000e-004**	**0.0000**	**3.9610**

3.7 Architectural Coating - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1900e-003	3.4900e-003	0.0513	2.9000e-004	0.0468	1.3000e-004	0.0469	0.0124	1.2000e-004	0.0126	0.0000	26.3087	26.3087	2.4000e-004	0.0000	26.3146
Total	**6.1900e-003**	**3.4900e-003**	**0.0513**	**2.9000e-004**	**0.0468**	**1.3000e-004**	**0.0469**	**0.0124**	**1.2000e-004**	**0.0126**	**0.0000**	**26.3087**	**26.3087**	**2.4000e-004**	**0.0000**	**26.3146**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044
Unmitigated	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	15,543.10	2,943.60	1516.40	34,273,184	34,273,184
Government Office Building	13,510.28	0.00	0.00	16,548,939	16,548,939
Office Park	5,093.32	731.44	338.96	9,501,184	9,501,184
Refrigerated Warehouse-No Rail	2,997.12	2,997.12	2997.12	8,750,125	8,750,125
Total	37,143.82	6,672.16	4,852.48	69,073,432	69,073,432

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Government Office Building	9.50	7.30	7.30	33.00	62.00	5.00	50	34	16
Office Park	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Government Office Building	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.501 0	3,176.501 0	0.0609	0.0582	3,195.377 3
NaturalGas Unmitigated	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.501 0	3,176.501 0	0.0609	0.0582	3,195.377 3

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.65401e+007	0.2510	2.2814	1.9164	0.0137		0.1734	0.1734		0.1734	0.1734	0.0000	2,483.5570	2,483.5570	0.0476	0.0455	2,498.3155
Government Office Building	2.5578e+006	0.0138	0.1254	0.1053	7.5000e-004		9.5300e-003	9.5300e-003		9.5300e-003	9.5300e-003	0.0000	136.4940	136.4940	2.6200e-003	2.5000e-003	137.3051
Office Park	1.01599e+007	0.0548	0.4980	0.4184	2.9900e-003		0.0379	0.0379		0.0379	0.0379	0.0000	542.1699	542.1699	0.0104	9.9400e-003	545.3917
Refrigerated Warehouse-No Rail	267600	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2802	14.2802	2.7000e-004	2.6000e-004	14.3650
Total		**0.3210**	**2.9179**	**2.4511**	**0.0175**		**0.2218**	**0.2218**		**0.2218**	**0.2218**	**0.0000**	**3,176.5010**	**3,176.5010**	**0.0609**	**0.0582**	**3,195.3773**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.65401e+007	0.2510	2.2814	1.9164	0.0137		0.1734	0.1734		0.1734	0.1734	0.0000	2,483.5570	2,483.5570	0.0476	0.0455	2,498.3155
Government Office Building	2.5578e+006	0.0138	0.1254	0.1053	7.5000e-004		9.5300e-003	9.5300e-003		9.5300e-003	9.5300e-003	0.0000	136.4940	136.4940	2.6200e-003	2.5000e-003	137.3051
Office Park	1.01599e+007	0.0548	0.4980	0.4184	2.9900e-003		0.0379	0.0379		0.0379	0.0379	0.0000	542.1699	542.1699	0.0104	9.9400e-003	545.3917
Refrigerated Warehouse-No Rail	267600	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2802	14.2802	2.7000e-004	2.6000e-004	14.3650
Total		**0.3210**	**2.9179**	**2.4511**	**0.0175**		**0.2218**	**0.2218**		**0.2218**	**0.2218**	**0.0000**	**3,176.5010**	**3,176.5010**	**0.0609**	**0.0582**	**3,195.3773**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.96686e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	1.78752e +006	0.0000	0.0000	0.0000	0.0000
Office Park	5.20036e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.44394e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.96686e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	1.78752e +006	0.0000	0.0000	0.0000	0.0000
Office Park	5.20036e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.44394e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Unmitigated	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	18.1840					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.8900e-003	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Total	**21.4250**	**3.8000e-004**	**0.0425**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0832**	**0.0832**	**2.1000e-004**	**0.0000**	**0.0886**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	18.1840					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.8900e-003	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Total	**21.4250**	**3.8000e-004**	**0.0425**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0832**	**0.0832**	**2.1000e-004**	**0.0000**	**0.0886**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	331.9884	34.0984	0.8051	1,424.379 1
Unmitigated	331.9884	34.0984	0.8051	1,424.379 1

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	515.688 / 0	163.6039	16.8037	0.3968	701.9338
Government Office Building	38.9373 / 23.8648	12.3530	1.2688	0.0300	52.9999
Office Park	79.2693 / 48.5844	25.1485	2.5830	0.0610	107.8982
Refrigerated Warehouse-No Rail	412.55 / 0	130.8831	13.4430	0.3174	561.5471
Total		**331.9884**	**34.0984**	**0.8051**	**1,424.379 1**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	515.688 / 0	163.6039	16.8037	0.3968	701.9338
Government Office Building	38.9373 / 23.8648	12.3530	1.2688	0.0300	52.9999
Office Park	79.2693 / 48.5844	25.1485	2.5830	0.0610	107.8982
Refrigerated Warehouse-No Rail	412.55 / 0	130.8831	13.4430	0.3174	561.5471
Total		**331.9884**	**34.0984**	**0.8051**	**1,424.3791**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1,022.9161	60.4526	0.0000	2,534.2314
Unmitigated	1,022.9161	60.4526	0.0000	2,534.2314

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	2765.2	561.3106	33.1725	0.0000	1,390.6233
Government Office Building	182.28	37.0012	2.1867	0.0000	91.6689
Office Park	414.78	84.1966	4.9759	0.0000	208.5935
Refrigerated Warehouse-No Rail	1676.96	340.4077	20.1175	0.0000	843.3457
Total		**1,022.9161**	**60.4526**	**0.0000**	**2,534.2314**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	2765.2	561.3106	33.1725	0.0000	1,390.623 3
Government Office Building	182.28	37.0012	2.1867	0.0000	91.6689
Office Park	414.78	84.1966	4.9759	0.0000	208.5935
Refrigerated Warehouse-No Rail	1676.96	340.4077	20.1175	0.0000	843.3457
Total		**1,022.916 1**	**60.4526**	**0.0000**	**2,534.231 4**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Crows Landing_Phase 3

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	196.00	1000sqft	18.00	196,000.00	0
Office Park	446.00	1000sqft	26.00	446,000.00	0
General Light Industry	2,230.00	1000sqft	128.00	2,230,000.00	0
Refrigerated Warehouse-No Rail	1,784.00	1000sqft	102.00	1,784,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Crows Landing_Phase 3 - Stanislaus County, Annual

Project Characteristics -

Land Use - PD

Construction Phase - Assumes infrastructure is front-loaded

Grading - Total acreage

Construction Off-road Equipment Mitigation - Potential Tier 4 mitigation

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Trenching

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Vehicle Trips -

Area Coating -

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	13.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	465.00	196.00
tblConstructionPhase	NumDays	180.00	76.00
tblConstructionPhase	NumDays	4,650.00	1,956.00
tblConstructionPhase	NumDays	330.00	139.00
tblConstructionPhase	NumDays	330.00	139.00
tblConstructionPhase	PhaseEndDate	6/21/2041	10/10/2039
tblConstructionPhase	PhaseEndDate	6/21/2041	4/17/2040
tblConstructionPhase	PhaseEndDate	9/9/2039	8/1/2040
tblConstructionPhase	PhaseEndDate	4/18/2059	1/30/2048
tblConstructionPhase	PhaseEndDate	7/23/2060	2/12/2041
tblConstructionPhase	PhaseEndDate	10/28/2061	2/12/2041

tblConstructionPhase	PhaseStartDate	9/10/2039	1/10/2039
tblConstructionPhase	PhaseStartDate	6/22/2041	10/11/2039
tblConstructionPhase	PhaseStartDate	1/1/2039	4/18/2040
tblConstructionPhase	PhaseStartDate	6/22/2041	8/2/2040
tblConstructionPhase	PhaseStartDate	4/19/2059	8/2/2040
tblConstructionPhase	PhaseStartDate	7/24/2060	8/2/2040
tblGrading	AcresOfGrading	490.00	274.00
tblGrading	AcresOfGrading	0.00	274.00
tblLandUse	LotAcreage	4.50	18.00
tblLandUse	LotAcreage	10.24	26.00
tblLandUse	LotAcreage	51.19	128.00
tblLandUse	LotAcreage	40.96	102.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2039	0.3523	1.2412	2.7049	8.3600e-003	0.7554	0.0395	0.7948	0.3454	0.0395	0.3848	0.0000	771.0191	771.0191	0.0279	0.0000	771.7177
2040	25.6782	4.5869	4.7974	0.0250	2.1235	0.0379	2.1614	0.7424	0.0376	0.7799	0.0000	2,269.1118	2,269.1118	0.0913	0.0000	2,271.3954
2041	7.8236	8.6833	5.6132	0.0427	2.6787	0.0239	2.7026	0.7271	0.0232	0.7503	0.0000	3,959.0172	3,959.0172	0.1701	0.0000	3,963.2699
2042	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2043	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2044	0.5804	8.6118	5.2870	0.0419	2.6300	0.0219	2.6519	0.7142	0.0211	0.7353	0.0000	3,890.3527	3,890.3527	0.1685	0.0000	3,894.5644
2045	0.5415	8.5218	5.0990	0.0415	2.6200	0.0210	2.6409	0.7115	0.0203	0.7318	0.0000	3,852.8489	3,852.8489	0.1641	0.0000	3,856.9514
2046	0.5436	8.5546	5.1186	0.0417	2.6300	0.0211	2.6511	0.7142	0.0204	0.7346	0.0000	3,867.6676	3,867.6676	0.1647	0.0000	3,871.7858
2047	0.5436	8.5546	5.1186	0.0417	2.6300	0.0211	2.6511	0.7142	0.0204	0.7346	0.0000	3,867.6676	3,867.6676	0.1647	0.0000	3,871.7858
2048	0.0458	0.7211	0.4315	3.5100e-003	0.2217	1.7800e-003	0.2235	0.0602	1.7200e-003	0.0619	0.0000	326.0103	326.0103	0.0139	0.0000	326.3574
Maximum	**25.6782**	**8.6833**	**5.6132**	**0.0427**	**2.6787**	**0.0395**	**2.7026**	**0.7424**	**0.0395**	**0.7799**	**0.0000**	**3,959.0172**	**3,959.0172**	**0.1701**	**0.0000**	**3,963.2699**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2039	0.0920	0.3848	3.8758	8.3600e-003	0.3509	0.0119	0.3627	0.1583	0.0119	0.1702	0.0000	771.0182	771.0182	0.0279	0.0000	771.7168
2040	25.4341	3.6049	5.5349	0.0250	1.6660	0.0164	1.6824	0.5262	0.0160	0.5422	0.0000	2,269.1110	2,269.1110	0.0913	0.0000	2,271.3946
2041	7.6976	8.0287	5.8118	0.0427	2.6787	0.0183	2.6970	0.7271	0.0176	0.7447	0.0000	3,959.0167	3,959.0167	0.1701	0.0000	3,963.2694
2042	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2043	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2044	0.4669	8.0042	5.4621	0.0419	2.6300	0.0176	2.6476	0.7142	0.0168	0.7310	0.0000	3,890.3523	3,890.3523	0.1685	0.0000	3,894.5640
2045	0.4285	7.9166	5.2735	0.0415	2.6200	0.0167	2.6367	0.7115	0.0160	0.7275	0.0000	3,852.8485	3,852.8485	0.1641	0.0000	3,856.9510
2046	0.4301	7.9470	5.2937	0.0417	2.6300	0.0168	2.6468	0.7142	0.0161	0.7303	0.0000	3,867.6671	3,867.6671	0.1647	0.0000	3,871.7854
2047	0.4301	7.9470	5.2937	0.0417	2.6300	0.0168	2.6468	0.7142	0.0161	0.7303	0.0000	3,867.6671	3,867.6671	0.1647	0.0000	3,871.7854
2048	0.0363	0.6699	0.4462	3.5100e-003	0.2217	1.4100e-003	0.2231	0.0602	1.3600e-003	0.0616	0.0000	326.0103	326.0103	0.0139	0.0000	326.3574
Maximum	**25.4341**	**8.0287**	**5.8118**	**0.0427**	**2.6787**	**0.0183**	**2.6970**	**0.7271**	**0.0176**	**0.7447**	**0.0000**	**3,959.0167**	**3,959.0167**	**0.1701**	**0.0000**	**3,963.2694**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**3.54**	**9.28**	**-7.09**	**0.00**	**4.00**	**34.90**	**4.33**	**6.55**	**35.72**	**7.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2039**	**3-31-2039**	0.3631	0.1189
2	**4-1-2039**	**6-30-2039**	0.4079	0.1335
3	**7-1-2039**	**9-30-2039**	0.4124	0.1350
4	**10-1-2039**	**12-31-2039**	0.4060	0.0886
5	**1-1-2040**	**3-31-2040**	0.3248	0.0818
6	**4-1-2040**	**6-30-2040**	0.4730	0.1274
7	**7-1-2040**	**9-30-2040**	11.7950	11.4641
8	**10-1-2040**	**12-31-2040**	17.8246	17.5164
9	**1-1-2041**	**3-31-2041**	9.5145	9.2778
10	**4-1-2041**	**6-30-2041**	2.2801	2.1006
11	**7-1-2041**	**9-30-2041**	2.3052	2.1237
12	**10-1-2041**	**12-31-2041**	2.3166	2.1351
13	**1-1-2042**	**3-31-2042**	2.2662	2.0886
14	**4-1-2042**	**6-30-2042**	2.2801	2.1006
15	**7-1-2042**	**9-30-2042**	2.3052	2.1237
16	**10-1-2042**	**12-31-2042**	2.3166	2.1351
17	**1-1-2043**	**3-31-2043**	2.2662	2.0886
18	**4-1-2043**	**6-30-2043**	2.2801	2.1006
19	**7-1-2043**	**9-30-2043**	2.3052	2.1237
20	**10-1-2043**	**12-31-2043**	2.3166	2.1351
21	**1-1-2044**	**3-31-2044**	2.2914	2.1119
22	**4-1-2044**	**6-30-2044**	2.2801	2.1006
23	**7-1-2044**	**9-30-2044**	2.3052	2.1237
24	**10-1-2044**	**12-31-2044**	2.3166	2.1351
25	**1-1-2045**	**3-31-2045**	2.2424	2.0648
26	**4-1-2045**	**6-30-2045**	2.2560	2.0764

27	**7-1-2045**	**9-30-2045**	2.2807	2.0992
28	**10-1-2045**	**12-31-2045**	2.2922	2.1107
29	**1-1-2046**	**3-31-2046**	2.2424	2.0648
30	**4-1-2046**	**6-30-2046**	2.2560	2.0764
31	**7-1-2046**	**9-30-2046**	2.2807	2.0992
32	**10-1-2046**	**12-31-2046**	2.2922	2.1107
33	**1-1-2047**	**3-31-2047**	2.2424	2.0648
34	**4-1-2047**	**6-30-2047**	2.2560	2.0764
35	**7-1-2047**	**9-30-2047**	2.2807	2.0992
36	**10-1-2047**	**12-31-2047**	2.2922	2.1107
37	**1-1-2048**	**3-31-2048**	0.7475	0.6883
		Highest	17.8246	17.5164

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Energy	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.5010	3,176.5010	0.0609	0.0582	3,195.3773
Mobile	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044
Waste						0.0000	0.0000		0.0000	0.0000	1,022.9161	0.0000	1,022.9161	60.4526	0.0000	2,534.2314
Water						0.0000	0.0000		0.0000	0.0000	331.9884	0.0000	331.9884	34.0984	0.8051	1,424.3791
Total	**25.2746**	**58.0274**	**39.7562**	**0.3331**	**26.1759**	**0.3270**	**26.5030**	**7.0245**	**0.3205**	**7.3449**	**1,354.9045**	**32,609.3107**	**33,964.2152**	**96.2312**	**0.8634**	**36,627.2808**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Energy	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.5010	3,176.5010	0.0609	0.0582	3,195.3773
Mobile	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044
Waste						0.0000	0.0000		0.0000	0.0000	1,022.9161	0.0000	1,022.9161	60.4526	0.0000	2,534.2314
Water						0.0000	0.0000		0.0000	0.0000	331.9884	0.0000	331.9884	34.0984	0.8051	1,424.3791
Total	**25.2746**	**58.0274**	**39.7562**	**0.3331**	**26.1759**	**0.3270**	**26.5030**	**7.0245**	**0.3205**	**7.3449**	**1,354.9045**	**32,609.3107**	**33,964.2152**	**96.2312**	**0.8634**	**36,627.2808**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/18/2040	8/1/2040	5	76	
2	Grading	Grading	1/10/2039	10/10/2039	5	196	
3	Trenching	Trenching	10/11/2039	4/17/2040	5	136	
4	Building Construction	Building Construction	8/2/2040	1/30/2048	5	1956	
5	Paving	Paving	8/2/2040	2/12/2041	5	139	
6	Architectural Coating	Architectural Coating	8/2/2040	2/12/2041	5	139	

Acres of Grading (Site Preparation Phase): 274

Acres of Grading (Grading Phase): 274

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,984,000; Non-Residential Outdoor: 2,328,000; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Rubber Tired Dozers	3	8.00	247	0.40
Trenching	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	1,891.00	763.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	378.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8318	0.0000	0.8318	0.3931	0.0000	0.3931	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1250	0.4647	0.8430	2.9600e-003		0.0139	0.0139		0.0139	0.0139	0.0000	254.4314	254.4314	9.8500e-003	0.0000	254.6776
Total	**0.1250**	**0.4647**	**0.8430**	**2.9600e-003**	**0.8318**	**0.0139**	**0.8457**	**0.3931**	**0.0139**	**0.4069**	**0.0000**	**254.4314**	**254.4314**	**9.8500e-003**	**0.0000**	**254.6776**

3.2 Site Preparation - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0100e-003	1.1300e-003	0.0166	9.0000e-005	0.0283	4.0000e-005	0.0284	7.2600e-003	4.0000e-005	7.3000e-003	0.0000	8.5316	8.5316	8.0000e-005	0.0000	8.5335
Total	**2.0100e-003**	**1.1300e-003**	**0.0166**	**9.0000e-005**	**0.0283**	**4.0000e-005**	**0.0284**	**7.2600e-003**	**4.0000e-005**	**7.3000e-003**	**0.0000**	**8.5316**	**8.5316**	**8.0000e-005**	**0.0000**	**8.5335**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3743	0.0000	0.3743	0.1769	0.0000	0.1769	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0296	0.1283	1.2301	2.9600e-003		3.9500e-003	3.9500e-003		3.9500e-003	3.9500e-003	0.0000	254.4311	254.4311	9.8500e-003	0.0000	254.6773
Total	**0.0296**	**0.1283**	**1.2301**	**2.9600e-003**	**0.3743**	**3.9500e-003**	**0.3783**	**0.1769**	**3.9500e-003**	**0.1808**	**0.0000**	**254.4311**	**254.4311**	**9.8500e-003**	**0.0000**	**254.6773**

3.2 Site Preparation - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0100e-003	1.1300e-003	0.0166	9.0000e-005	0.0283	4.0000e-005	0.0284	7.2600e-003	4.0000e-005	7.3000e-003	0.0000	8.5316	8.5316	8.0000e-005	0.0000	8.5335
Total	**2.0100e-003**	**1.1300e-003**	**0.0166**	**9.0000e-005**	**0.0283**	**4.0000e-005**	**0.0284**	**7.2600e-003**	**4.0000e-005**	**7.3000e-003**	**0.0000**	**8.5316**	**8.5316**	**8.0000e-005**	**0.0000**	**8.5335**

3.3 Grading - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.7355	0.0000	0.7355	0.3401	0.0000	0.3401	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2853	0.9402	2.2075	6.8500e-003		0.0308	0.0308		0.0308	0.0308	0.0000	641.2755	641.2755	0.0228	0.0000	641.8444
Total	**0.2853**	**0.9402**	**2.2075**	**6.8500e-003**	**0.7355**	**0.0308**	**0.7662**	**0.3401**	**0.0308**	**0.3709**	**0.0000**	**641.2755**	**641.2755**	**0.0228**	**0.0000**	**641.8444**

3.3 Grading - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8400e-003	1.4600e-003	0.0207	1.0000e-004	0.0157	6.0000e-005	0.0157	4.1600e-003	5.0000e-005	4.2100e-003	0.0000	9.2296	9.2296	1.1000e-004	0.0000	9.2322
Total	**2.8400e-003**	**1.4600e-003**	**0.0207**	**1.0000e-004**	**0.0157**	**6.0000e-005**	**0.0157**	**4.1600e-003**	**5.0000e-005**	**4.2100e-003**	**0.0000**	**9.2296**	**9.2296**	**1.1000e-004**	**0.0000**	**9.2322**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3310	0.0000	0.3310	0.1530	0.0000	0.1530	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0746	0.3234	3.2339	6.8500e-003		9.9500e-003	9.9500e-003		9.9500e-003	9.9500e-003	0.0000	641.2748	641.2748	0.0228	0.0000	641.8436
Total	**0.0746**	**0.3234**	**3.2339**	**6.8500e-003**	**0.3310**	**9.9500e-003**	**0.3409**	**0.1530**	**9.9500e-003**	**0.1630**	**0.0000**	**641.2748**	**641.2748**	**0.0228**	**0.0000**	**641.8436**

3.3 Grading - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8400e-003	1.4600e-003	0.0207	1.0000e-004	0.0157	6.0000e-005	0.0157	4.1600e-003	5.0000e-005	4.2100e-003	0.0000	9.2296	9.2296	1.1000e-004	0.0000	9.2322
Total	**2.8400e-003**	**1.4600e-003**	**0.0207**	**1.0000e-004**	**0.0157**	**6.0000e-005**	**0.0157**	**4.1600e-003**	**5.0000e-005**	**4.2100e-003**	**0.0000**	**9.2296**	**9.2296**	**1.1000e-004**	**0.0000**	**9.2322**

3.4 Trenching - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0634	0.2991	0.4712	1.3700e-003		8.5900e-003	8.5900e-003		8.5900e-003	8.5900e-003	0.0000	118.0136	118.0136	5.0600e-003	0.0000	118.1400
Total	**0.0634**	**0.2991**	**0.4712**	**1.3700e-003**		**8.5900e-003**	**8.5900e-003**		**8.5900e-003**	**8.5900e-003**	**0.0000**	**118.0136**	**118.0136**	**5.0600e-003**	**0.0000**	**118.1400**

3.4 Trenching - 2039

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	3.9000e-004	5.5900e-003	3.0000e-005	4.2400e-003	2.0000e-005	4.2600e-003	1.1300e-003	1.0000e-005	1.1400e-003	0.0000	2.5005	2.5005	3.0000e-005	0.0000	2.5012
Total	**7.7000e-004**	**3.9000e-004**	**5.5900e-003**	**3.0000e-005**	**4.2400e-003**	**2.0000e-005**	**4.2600e-003**	**1.1300e-003**	**1.0000e-005**	**1.1400e-003**	**0.0000**	**2.5005**	**2.5005**	**3.0000e-005**	**0.0000**	**2.5012**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0137	0.0595	0.6156	1.3700e-003		1.8300e-003	1.8300e-003		1.8300e-003	1.8300e-003	0.0000	118.0135	118.0135	5.0600e-003	0.0000	118.1399
Total	**0.0137**	**0.0595**	**0.6156**	**1.3700e-003**		**1.8300e-003**	**1.8300e-003**		**1.8300e-003**	**1.8300e-003**	**0.0000**	**118.0135**	**118.0135**	**5.0600e-003**	**0.0000**	**118.1399**

3.4 Trenching - 2039

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-004	3.9000e-004	5.5900e-003	3.0000e-005	4.2400e-003	2.0000e-005	4.2600e-003	1.1300e-003	1.0000e-005	1.1400e-003	0.0000	2.5005	2.5005	3.0000e-005	0.0000	2.5012
Total	**7.7000e-004**	**3.9000e-004**	**5.5900e-003**	**3.0000e-005**	**4.2400e-003**	**2.0000e-005**	**4.2600e-003**	**1.1300e-003**	**1.0000e-005**	**1.1400e-003**	**0.0000**	**2.5005**	**2.5005**	**3.0000e-005**	**0.0000**	**2.5012**

3.4 Trenching - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0757	0.3078	0.6075	1.7900e-003		7.8000e-003	7.8000e-003		7.8000e-003	7.8000e-003	0.0000	154.0178	154.0178	5.9600e-003	0.0000	154.1668
Total	**0.0757**	**0.3078**	**0.6075**	**1.7900e-003**		**7.8000e-003**	**7.8000e-003**		**7.8000e-003**	**7.8000e-003**	**0.0000**	**154.0178**	**154.0178**	**5.9600e-003**	**0.0000**	**154.1668**

3.4 Trenching - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	4.1000e-004	6.0600e-003	3.0000e-005	5.5400e-003	1.0000e-005	5.5500e-003	1.4700e-003	1.0000e-005	1.4900e-003	0.0000	3.1118	3.1118	3.0000e-005	0.0000	3.1125
Total	**7.3000e-004**	**4.1000e-004**	**6.0600e-003**	**3.0000e-005**	**5.5400e-003**	**1.0000e-005**	**5.5500e-003**	**1.4700e-003**	**1.0000e-005**	**1.4900e-003**	**0.0000**	**3.1118**	**3.1118**	**3.0000e-005**	**0.0000**	**3.1125**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0179	0.0777	0.8035	1.7900e-003		2.3900e-003	2.3900e-003		2.3900e-003	2.3900e-003	0.0000	154.0176	154.0176	5.9600e-003	0.0000	154.1666
Total	**0.0179**	**0.0777**	**0.8035**	**1.7900e-003**		**2.3900e-003**	**2.3900e-003**		**2.3900e-003**	**2.3900e-003**	**0.0000**	**154.0176**	**154.0176**	**5.9600e-003**	**0.0000**	**154.1666**

3.4 Trenching - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.3000e-004	4.1000e-004	6.0600e-003	3.0000e-005	5.5400e-003	1.0000e-005	5.5500e-003	1.4700e-003	1.0000e-005	1.4900e-003	0.0000	3.1118	3.1118	3.0000e-005	0.0000	3.1125
Total	**7.3000e-004**	**4.1000e-004**	**6.0600e-003**	**3.0000e-005**	**5.5400e-003**	**1.0000e-005**	**5.5500e-003**	**1.4700e-003**	**1.0000e-005**	**1.4900e-003**	**0.0000**	**3.1118**	**3.1118**	**3.0000e-005**	**0.0000**	**3.1125**

3.5 Building Construction - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0646	0.3721	0.8704	1.6700e-003		3.9800e-003	3.9800e-003		3.9800e-003	3.9800e-003	0.0000	141.9450	141.9450	5.1000e-003	0.0000	142.0725
Total	**0.0646**	**0.3721**	**0.8704**	**1.6700e-003**		**3.9800e-003**	**3.9800e-003**		**3.9800e-003**	**3.9800e-003**	**0.0000**	**141.9450**	**141.9450**	**5.1000e-003**	**0.0000**	**142.0725**

3.5 Building Construction - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0676	3.1305	0.4242	0.0106	0.2724	2.8600e-003	0.2753	0.0787	2.7300e-003	0.0814	0.0000	1,009.3331	1,009.3331	0.0605	0.0000	1,010.8452
Worker	0.1079	0.0609	0.8932	5.0600e-003	0.8159	2.2000e-003	0.8181	0.2169	2.0300e-003	0.2189	0.0000	458.5231	458.5231	4.1300e-003	0.0000	458.6262
Total	**0.1755**	**3.1914**	**1.3173**	**0.0157**	**1.0883**	**5.0600e-003**	**1.0934**	**0.2955**	**4.7600e-003**	**0.3003**	**0.0000**	**1,467.8561**	**1,467.8561**	**0.0646**	**0.0000**	**1,469.4714**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0177	0.1207	0.9429	1.6700e-003		2.2000e-003	2.2000e-003		2.2000e-003	2.2000e-003	0.0000	141.9448	141.9448	5.1000e-003	0.0000	142.0723
Total	**0.0177**	**0.1207**	**0.9429**	**1.6700e-003**		**2.2000e-003**	**2.2000e-003**		**2.2000e-003**	**2.2000e-003**	**0.0000**	**141.9448**	**141.9448**	**5.1000e-003**	**0.0000**	**142.0723**

3.5 Building Construction - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0676	3.1305	0.4242	0.0106	0.2724	2.8600e-003	0.2753	0.0787	2.7300e-003	0.0814	0.0000	1,009.3331	1,009.3331	0.0605	0.0000	1,010.8452
Worker	0.1079	0.0609	0.8932	5.0600e-003	0.8159	2.2000e-003	0.8181	0.2169	2.0300e-003	0.2189	0.0000	458.5231	458.5231	4.1300e-003	0.0000	458.6262
Total	**0.1755**	**3.1914**	**1.3173**	**0.0157**	**1.0883**	**5.0600e-003**	**1.0934**	**0.2955**	**4.7600e-003**	**0.3003**	**0.0000**	**1,467.8561**	**1,467.8561**	**0.0646**	**0.0000**	**1,469.4714**

3.5 Building Construction - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2042

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2042

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2042

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2043

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2043

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2043

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2044

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2044

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2044

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1634	7.5654	1.0251	0.0257	0.6584	6.9100e-003	0.6653	0.1901	6.6100e-003	0.1967	0.0000	2,439.2216	2,439.2216	0.1462	0.0000	2,442.8759
Worker	0.2607	0.1471	2.1585	0.0122	1.9717	5.3200e-003	1.9770	0.5241	4.9000e-003	0.5290	0.0000	1,108.0974	1,108.0974	9.9700e-003	0.0000	1,108.3467
Total	**0.4241**	**7.7126**	**3.1835**	**0.0379**	**2.6300**	**0.0122**	**2.6423**	**0.7142**	**0.0115**	**0.7257**	**0.0000**	**3,547.3190**	**3,547.3190**	**0.1561**	**0.0000**	**3,551.2225**

3.5 Building Construction - 2045

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1556	0.8957	2.0954	4.0200e-003		9.5800e-003	9.5800e-003		9.5800e-003	9.5800e-003	0.0000	341.7194	341.7194	0.0123	0.0000	342.0264
Total	**0.1556**	**0.8957**	**2.0954**	**4.0200e-003**		**9.5800e-003**	**9.5800e-003**		**9.5800e-003**	**9.5800e-003**	**0.0000**	**341.7194**	**341.7194**	**0.0123**	**0.0000**	**342.0264**

3.5 Building Construction - 2045

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1626	7.4917	1.0186	0.0255	0.6558	6.8300e-003	0.6627	0.1894	6.5300e-003	0.1959	0.0000	2,427.1760	2,427.1760	0.1429	0.0000	2,430.7485
Worker	0.2233	0.1344	1.9850	0.0120	1.9641	4.5700e-003	1.9687	0.5221	4.2000e-003	0.5263	0.0000	1,083.9535	1,083.9535	8.9200e-003	0.0000	1,084.1765
Total	**0.3859**	**7.6261**	**3.0036**	**0.0375**	**2.6200**	**0.0114**	**2.6314**	**0.7115**	**0.0107**	**0.7222**	**0.0000**	**3,511.1295**	**3,511.1295**	**0.1518**	**0.0000**	**3,514.9250**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0426	0.2905	2.2698	4.0200e-003		5.3000e-003	5.3000e-003		5.3000e-003	5.3000e-003	0.0000	341.7190	341.7190	0.0123	0.0000	342.0260
Total	**0.0426**	**0.2905**	**2.2698**	**4.0200e-003**		**5.3000e-003**	**5.3000e-003**		**5.3000e-003**	**5.3000e-003**	**0.0000**	**341.7190**	**341.7190**	**0.0123**	**0.0000**	**342.0260**

3.5 Building Construction - 2045

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1626	7.4917	1.0186	0.0255	0.6558	6.8300e-003	0.6627	0.1894	6.5300e-003	0.1959	0.0000	2,427.1760	2,427.1760	0.1429	0.0000	2,430.7485
Worker	0.2233	0.1344	1.9850	0.0120	1.9641	4.5700e-003	1.9687	0.5221	4.2000e-003	0.5263	0.0000	1,083.9535	1,083.9535	8.9200e-003	0.0000	1,084.1765
Total	**0.3859**	**7.6261**	**3.0036**	**0.0375**	**2.6200**	**0.0114**	**2.6314**	**0.7115**	**0.0107**	**0.7222**	**0.0000**	**3,511.1295**	**3,511.1295**	**0.1518**	**0.0000**	**3,514.9250**

3.5 Building Construction - 2046

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2046

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2046

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

3.5 Building Construction - 2047

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1562	0.8992	2.1035	4.0400e-003		9.6200e-003	9.6200e-003		9.6200e-003	9.6200e-003	0.0000	343.0337	343.0337	0.0123	0.0000	343.3419
Total	**0.1562**	**0.8992**	**2.1035**	**4.0400e-003**		**9.6200e-003**	**9.6200e-003**		**9.6200e-003**	**9.6200e-003**	**0.0000**	**343.0337**	**343.0337**	**0.0123**	**0.0000**	**343.3419**

3.5 Building Construction - 2047

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.5113	2,436.5113	0.1435	0.0000	2,440.0975
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.1225	1,088.1225	8.9600e-003	0.0000	1,088.3464
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.6339**	**3,524.6339**	**0.1524**	**0.0000**	**3,528.4440**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.2916	2.2786	4.0400e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	343.0333	343.0333	0.0123	0.0000	343.3415
Total	**0.0428**	**0.2916**	**2.2786**	**4.0400e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**343.0333**	**343.0333**	**0.0123**	**0.0000**	**343.3415**

3.5 Building Construction - 2047

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1632	7.5205	1.0225	0.0256	0.6583	6.8600e-003	0.6652	0.1901	6.5600e-003	0.1967	0.0000	2,436.511 3	2,436.511 3	0.1435	0.0000	2,440.097 5
Worker	0.2242	0.1349	1.9927	0.0120	1.9717	4.5800e-003	1.9763	0.5241	4.2200e-003	0.5283	0.0000	1,088.122 5	1,088.122 5	8.9600e-003	0.0000	1,088.346 4
Total	**0.3874**	**7.6554**	**3.0152**	**0.0376**	**2.6300**	**0.0114**	**2.6415**	**0.7142**	**0.0108**	**0.7250**	**0.0000**	**3,524.633 9**	**3,524.633 9**	**0.1524**	**0.0000**	**3,528.444 0**

3.5 Building Construction - 2048

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0132	0.0758	0.1773	3.4000e-004		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	28.9147	28.9147	1.0400e-003	0.0000	28.9407
Total	**0.0132**	**0.0758**	**0.1773**	**3.4000e-004**		**8.1000e-004**	**8.1000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**28.9147**	**28.9147**	**1.0400e-003**	**0.0000**	**28.9407**

3.5 Building Construction - 2048

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0138	0.6339	0.0862	2.1600e-003	0.0555	5.8000e-004	0.0561	0.0160	5.5000e-004	0.0166	0.0000	205.3764	205.3764	0.0121	0.0000	205.6787
Worker	0.0189	0.0114	0.1680	1.0100e-003	0.1662	3.9000e-004	0.1666	0.0442	3.6000e-004	0.0445	0.0000	91.7191	91.7191	7.5000e-004	0.0000	91.7380
Total	**0.0327**	**0.6453**	**0.2542**	**3.1700e-003**	**0.2217**	**9.7000e-004**	**0.2227**	**0.0602**	**9.1000e-004**	**0.0611**	**0.0000**	**297.0956**	**297.0956**	**0.0128**	**0.0000**	**297.4167**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6100e-003	0.0246	0.1921	3.4000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	28.9147	28.9147	1.0400e-003	0.0000	28.9407
Total	**3.6100e-003**	**0.0246**	**0.1921**	**3.4000e-004**		**4.5000e-004**	**4.5000e-004**		**4.5000e-004**	**4.5000e-004**	**0.0000**	**28.9147**	**28.9147**	**1.0400e-003**	**0.0000**	**28.9407**

3.5 Building Construction - 2048

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0138	0.6339	0.0862	2.1600e-003	0.0555	5.8000e-004	0.0561	0.0160	5.5000e-004	0.0166	0.0000	205.3764	205.3764	0.0121	0.0000	205.6787
Worker	0.0189	0.0114	0.1680	1.0100e-003	0.1662	3.9000e-004	0.1666	0.0442	3.6000e-004	0.0445	0.0000	91.7191	91.7191	7.5000e-004	0.0000	91.7380
Total	**0.0327**	**0.6453**	**0.2542**	**3.1700e-003**	**0.2217**	**9.7000e-004**	**0.2227**	**0.0602**	**9.1000e-004**	**0.0611**	**0.0000**	**297.0956**	**297.0956**	**0.0128**	**0.0000**	**297.4167**

3.6 Paving - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.1975	0.8542	1.5100e-003		6.2900e-003	6.2900e-003		6.2900e-003	6.2900e-003	0.0000	130.1374	130.1374	4.3700e-003	0.0000	130.2467
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0546**	**0.1975**	**0.8542**	**1.5100e-003**		**6.2900e-003**	**6.2900e-003**		**6.2900e-003**	**6.2900e-003**	**0.0000**	**130.1374**	**130.1374**	**4.3700e-003**	**0.0000**	**130.2467**

3.6 Paving - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	4.8000e-004	7.0800e-003	4.0000e-005	6.4700e-003	2.0000e-005	6.4900e-003	1.7200e-003	2.0000e-005	1.7400e-003	0.0000	3.6372	3.6372	3.0000e-005	0.0000	3.6380
Total	**8.6000e-004**	**4.8000e-004**	**7.0800e-003**	**4.0000e-005**	**6.4700e-003**	**2.0000e-005**	**6.4900e-003**	**1.7200e-003**	**2.0000e-005**	**1.7400e-003**	**0.0000**	**3.6372**	**3.6372**	**3.0000e-005**	**0.0000**	**3.6380**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0152	0.0656	0.9340	1.5100e-003		2.0200e-003	2.0200e-003		2.0200e-003	2.0200e-003	0.0000	130.1372	130.1372	4.3700e-003	0.0000	130.2466
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0152**	**0.0656**	**0.9340**	**1.5100e-003**		**2.0200e-003**	**2.0200e-003**		**2.0200e-003**	**2.0200e-003**	**0.0000**	**130.1372**	**130.1372**	**4.3700e-003**	**0.0000**	**130.2466**

3.6 Paving - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.6000e-004	4.8000e-004	7.0800e-003	4.0000e-005	6.4700e-003	2.0000e-005	6.4900e-003	1.7200e-003	2.0000e-005	1.7400e-003	0.0000	3.6372	3.6372	3.0000e-005	0.0000	3.6380
Total	**8.6000e-004**	**4.8000e-004**	**7.0800e-003**	**4.0000e-005**	**6.4700e-003**	**2.0000e-005**	**6.4900e-003**	**1.7200e-003**	**2.0000e-005**	**1.7400e-003**	**0.0000**	**3.6372**	**3.6372**	**3.0000e-005**	**0.0000**	**3.6380**

3.6 Paving - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.0567	0.2452	4.3000e-004		1.8000e-003	1.8000e-003		1.8000e-003	1.8000e-003	0.0000	37.3543	37.3543	1.2600e-003	0.0000	37.3856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0157**	**0.0567**	**0.2452**	**4.3000e-004**		**1.8000e-003**	**1.8000e-003**		**1.8000e-003**	**1.8000e-003**	**0.0000**	**37.3543**	**37.3543**	**1.2600e-003**	**0.0000**	**37.3856**

3.6 Paving - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.4000e-004	2.0300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8600e-003	4.9000e-004	0.0000	5.0000e-004	0.0000	1.0440	1.0440	1.0000e-005	0.0000	1.0442
Total	**2.5000e-004**	**1.4000e-004**	**2.0300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8600e-003**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**0.0000**	**1.0440**	**1.0440**	**1.0000e-005**	**0.0000**	**1.0442**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.3500e-003	0.0188	0.2681	4.3000e-004		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	37.3542	37.3542	1.2600e-003	0.0000	37.3856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.3500e-003**	**0.0188**	**0.2681**	**4.3000e-004**		**5.8000e-004**	**5.8000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**37.3542**	**37.3542**	**1.2600e-003**	**0.0000**	**37.3856**

3.6 Paving - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.4000e-004	2.0300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8600e-003	4.9000e-004	0.0000	5.0000e-004	0.0000	1.0440	1.0440	1.0000e-005	0.0000	1.0442
Total	**2.5000e-004**	**1.4000e-004**	**2.0300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8600e-003**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**0.0000**	**1.0440**	**1.0440**	**1.0000e-005**	**0.0000**	**1.0442**

3.7 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	25.1514					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2000e-003	0.0393	0.0968	1.6000e-004		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	13.7876	13.7876	4.9000e-004	0.0000	13.7997
Total	**25.1576**	**0.0393**	**0.0968**	**1.6000e-004**		**4.0000e-004**	**4.0000e-004**		**4.0000e-004**	**4.0000e-004**	**0.0000**	**13.7876**	**13.7876**	**4.9000e-004**	**0.0000**	**13.7997**

3.7 Architectural Coating - 2040

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0216	0.0122	0.1785	1.0100e-003	0.1631	4.4000e-004	0.1635	0.0434	4.1000e-004	0.0438	0.0000	91.6561	91.6561	8.2000e-004	0.0000	91.6767
Total	**0.0216**	**0.0122**	**0.1785**	**1.0100e-003**	**0.1631**	**4.4000e-004**	**0.1635**	**0.0434**	**4.1000e-004**	**0.0438**	**0.0000**	**91.6561**	**91.6561**	**8.2000e-004**	**0.0000**	**91.6767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	25.1514					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	6.9500e-003	0.0990	1.6000e-004		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	13.7876	13.7876	4.9000e-004	0.0000	13.7997
Total	**25.1530**	**6.9500e-003**	**0.0990**	**1.6000e-004**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**13.7876**	**13.7876**	**4.9000e-004**	**0.0000**	**13.7997**

3.7 Architectural Coating - 2040

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0216	0.0122	0.1785	1.0100e-003	0.1631	4.4000e-004	0.1635	0.0434	4.1000e-004	0.0438	0.0000	91.6561	91.6561	8.2000e-004	0.0000	91.6767
Total	**0.0216**	**0.0122**	**0.1785**	**1.0100e-003**	**0.1631**	**4.4000e-004**	**0.1635**	**0.0434**	**4.1000e-004**	**0.0438**	**0.0000**	**91.6561**	**91.6561**	**8.2000e-004**	**0.0000**	**91.6767**

3.7 Architectural Coating - 2041

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.2194					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7800e-003	0.0113	0.0278	5.0000e-005		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	3.9575	3.9575	1.4000e-004	0.0000	3.9610
Total	**7.2212**	**0.0113**	**0.0278**	**5.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**3.9575**	**3.9575**	**1.4000e-004**	**0.0000**	**3.9610**

3.7 Architectural Coating - 2041

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1900e-003	3.4900e-003	0.0513	2.9000e-004	0.0468	1.3000e-004	0.0469	0.0124	1.2000e-004	0.0126	0.0000	26.3087	26.3087	2.4000e-004	0.0000	26.3146
Total	**6.1900e-003**	**3.4900e-003**	**0.0513**	**2.9000e-004**	**0.0468**	**1.3000e-004**	**0.0469**	**0.0124**	**1.2000e-004**	**0.0126**	**0.0000**	**26.3087**	**26.3087**	**2.4000e-004**	**0.0000**	**26.3146**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	7.2194					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6000e-004	2.0000e-003	0.0284	5.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	3.9575	3.9575	1.4000e-004	0.0000	3.9610
Total	**7.2199**	**2.0000e-003**	**0.0284**	**5.0000e-005**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**3.9575**	**3.9575**	**1.4000e-004**	**0.0000**	**3.9610**

3.7 Architectural Coating - 2041

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1900e-003	3.4900e-003	0.0513	2.9000e-004	0.0468	1.3000e-004	0.0469	0.0124	1.2000e-004	0.0126	0.0000	26.3087	26.3087	2.4000e-004	0.0000	26.3146
Total	**6.1900e-003**	**3.4900e-003**	**0.0513**	**2.9000e-004**	**0.0468**	**1.3000e-004**	**0.0469**	**0.0124**	**1.2000e-004**	**0.0126**	**0.0000**	**26.3087**	**26.3087**	**2.4000e-004**	**0.0000**	**26.3146**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044
Unmitigated	3.5286	55.1091	37.2626	0.3156	26.1759	0.1051	26.2811	7.0245	0.0986	7.1230	0.0000	29,432.7265	29,432.7265	1.6191	0.0000	29,473.2044

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	15,543.10	2,943.60	1516.40	34,273,184	34,273,184
Government Office Building	13,510.28	0.00	0.00	16,548,939	16,548,939
Office Park	5,093.32	731.44	338.96	9,501,184	9,501,184
Refrigerated Warehouse-No Rail	2,997.12	2,997.12	2997.12	8,750,125	8,750,125
Total	37,143.82	6,672.16	4,852.48	69,073,432	69,073,432

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Government Office Building	9.50	7.30	7.30	33.00	62.00	5.00	50	34	16
Office Park	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Government Office Building	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.501 0	3,176.501 0	0.0609	0.0582	3,195.377 3
NaturalGas Unmitigated	0.3210	2.9179	2.4511	0.0175		0.2218	0.2218		0.2218	0.2218	0.0000	3,176.501 0	3,176.501 0	0.0609	0.0582	3,195.377 3

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.65401e +007	0.2510	2.2814	1.9164	0.0137		0.1734	0.1734		0.1734	0.1734	0.0000	2,483.557 0	2,483.557 0	0.0476	0.0455	2,498.315 5
Government Office Building	2.5578e +006	0.0138	0.1254	0.1053	7.5000e-004		9.5300e-003	9.5300e-003		9.5300e-003	9.5300e-003	0.0000	136.4940	136.4940	2.6200e-003	2.5000e-003	137.3051
Office Park	1.01599e +007	0.0548	0.4980	0.4184	2.9900e-003		0.0379	0.0379		0.0379	0.0379	0.0000	542.1699	542.1699	0.0104	9.9400e-003	545.3917
Refrigerated Warehouse-No Rail	267600	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2802	14.2802	2.7000e-004	2.6000e-004	14.3650
Total		**0.3210**	**2.9179**	**2.4511**	**0.0175**		**0.2218**	**0.2218**		**0.2218**	**0.2218**	**0.0000**	**3,176.501 0**	**3,176.501 0**	**0.0609**	**0.0582**	**3,195.377 3**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	4.65401e+007	0.2510	2.2814	1.9164	0.0137		0.1734	0.1734		0.1734	0.1734	0.0000	2,483.5570	2,483.5570	0.0476	0.0455	2,498.3155
Government Office Building	2.5578e+006	0.0138	0.1254	0.1053	7.5000e-004		9.5300e-003	9.5300e-003		9.5300e-003	9.5300e-003	0.0000	136.4940	136.4940	2.6200e-003	2.5000e-003	137.3051
Office Park	1.01599e+007	0.0548	0.4980	0.4184	2.9900e-003		0.0379	0.0379		0.0379	0.0379	0.0000	542.1699	542.1699	0.0104	9.9400e-003	545.3917
Refrigerated Warehouse-No Rail	267600	1.4400e-003	0.0131	0.0110	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.2802	14.2802	2.7000e-004	2.6000e-004	14.3650
Total		**0.3210**	**2.9179**	**2.4511**	**0.0175**		**0.2218**	**0.2218**		**0.2218**	**0.2218**	**0.0000**	**3,176.5010**	**3,176.5010**	**0.0609**	**0.0582**	**3,195.3773**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.96686e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	1.78752e +006	0.0000	0.0000	0.0000	0.0000
Office Park	5.20036e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.44394e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.96686e +007	0.0000	0.0000	0.0000	0.0000
Government Office Building	1.78752e +006	0.0000	0.0000	0.0000	0.0000
Office Park	5.20036e +006	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.44394e +007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Unmitigated	21.4250	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	18.1840					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.8900e-003	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Total	**21.4250**	**3.8000e-004**	**0.0425**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0832**	**0.0832**	**2.1000e-004**	**0.0000**	**0.0886**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	18.1840					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.8900e-003	3.8000e-004	0.0425	0.0000		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	0.0832	0.0832	2.1000e-004	0.0000	0.0886
Total	**21.4250**	**3.8000e-004**	**0.0425**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0832**	**0.0832**	**2.1000e-004**	**0.0000**	**0.0886**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	331.9884	34.0984	0.8051	1,424.379 1
Unmitigated	331.9884	34.0984	0.8051	1,424.379 1

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	515.688 / 0	163.6039	16.8037	0.3968	701.9338
Government Office Building	38.9373 / 23.8648	12.3530	1.2688	0.0300	52.9999
Office Park	79.2693 / 48.5844	25.1485	2.5830	0.0610	107.8982
Refrigerated Warehouse-No Rail	412.55 / 0	130.8831	13.4430	0.3174	561.5471
Total		**331.9884**	**34.0984**	**0.8051**	**1,424.379 1**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	515.688 / 0	163.6039	16.8037	0.3968	701.9338
Government Office Building	38.9373 / 23.8648	12.3530	1.2688	0.0300	52.9999
Office Park	79.2693 / 48.5844	25.1485	2.5830	0.0610	107.8982
Refrigerated Warehouse-No Rail	412.55 / 0	130.8831	13.4430	0.3174	561.5471
Total		**331.9884**	**34.0984**	**0.8051**	**1,424.3791**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1,022.916 1	60.4526	0.0000	2,534.231 4
Unmitigated	1,022.916 1	60.4526	0.0000	2,534.231 4

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	2765.2	561.3106	33.1725	0.0000	1,390.623 3
Government Office Building	182.28	37.0012	2.1867	0.0000	91.6689
Office Park	414.78	84.1966	4.9759	0.0000	208.5935
Refrigerated Warehouse-No Rail	1676.96	340.4077	20.1175	0.0000	843.3457
Total		**1,022.916 1**	**60.4526**	**0.0000**	**2,534.231 4**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	2765.2	561.3106	33.1725	0.0000	1,390.623 3
Government Office Building	182.28	37.0012	2.1867	0.0000	91.6689
Office Park	414.78	84.1966	4.9759	0.0000	208.5935
Refrigerated Warehouse-No Rail	1676.96	340.4077	20.1175	0.0000	843.3457
Total		**1,022.916 1**	**60.4526**	**0.0000**	**2,534.231 4**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Crows Landing Operational
Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	740.00	1000sqft	68.00	740,000.00	0
Office Park	2,327.00	1000sqft	78.00	2,327,000.00	0
General Light Industry	13,478.00	1000sqft	767.00	13,478,000.00	0
Refrigerated Warehouse-No Rail	5,955.00	1000sqft	349.00	5,955,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company	Turlock Irrigation District				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - TID provides electrical services and PG&E provides natural gas services to the region. Used TID for Utility Information as TID intensity factors are higher.

Land Use - Traffic report and land use plan

Construction Phase - no construction for this run

Off-road Equipment - no construction for this run

Trips and VMT - no construction for this run

Vehicle Trips - traffic report trip rates for all land uses

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Water And Wastewater -

Solid Waste -

Crows Landing Operational - Stanislaus County, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	155,000.00	32.00
tblConstructionPhase	PhaseEndDate	2/15/2613	2/13/2019
tblLandUse	LotAcreage	16.99	68.00
tblLandUse	LotAcreage	53.42	78.00
tblLandUse	LotAcreage	309.41	767.00
tblLandUse	LotAcreage	136.71	349.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0
tblProjectCharacteristics	CO2IntensityFactor	790	0
tblProjectCharacteristics	N2OIntensityFactor	0.006	0
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	3,688.00	15.00
tblTripsAndVMT	WorkerTripNumber	9,143.00	15.00
tblVehicleTrips	WD_TR	6.97	1.53
tblVehicleTrips	WD_TR	68.93	9.06
tblVehicleTrips	WD_TR	11.42	6.48

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	9.6100e-003	0.1143	0.0496	1.7000e-004	4.4200e-003	3.7300e-003	8.1500e-003	1.2100e-003	3.4400e-003	4.6500e-003	0.0000	15.8935	15.8935	2.9200e-003	0.0000	15.9666
Maximum	**9.6100e-003**	**0.1143**	**0.0496**	**1.7000e-004**	**4.4200e-003**	**3.7300e-003**	**8.1500e-003**	**1.2100e-003**	**3.4400e-003**	**4.6500e-003**	**0.0000**	**15.8935**	**15.8935**	**2.9200e-003**	**0.0000**	**15.9666**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	9.6100e-003	0.1143	0.0496	1.7000e-004	4.4200e-003	3.7300e-003	8.1500e-003	1.2100e-003	3.4400e-003	4.6500e-003	0.0000	15.8935	15.8935	2.9200e-003	0.0000	15.9666
Maximum	**9.6100e-003**	**0.1143**	**0.0496**	**1.7000e-004**	**4.4200e-003**	**3.7300e-003**	**8.1500e-003**	**1.2100e-003**	**3.4400e-003**	**4.6500e-003**	**0.0000**	**15.8935**	**15.8935**	**2.9200e-003**	**0.0000**	**15.9666**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Crows Landing Operational - Stanislaus County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2019	3-31-2019	0.1220	0.1220
		Highest	0.1220	0.1220

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Energy	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.2515	18,402.2515	0.3527	0.3374	18,511.6069
Mobile	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Waste						0.0000	0.0000		0.0000	0.0000	5,107.8068	0.0000	5,107.8068	301.8627	0.0000	12,654.3751
Water						0.0000	0.0000		0.0000	0.0000	1,603.5520	0.0000	1,603.5520	164.7002	3.8889	6,879.9567
Total	**112.0468**	**113.4071**	**92.4052**	**0.7686**	**58.1385**	**1.5120**	**59.6505**	**15.6018**	**1.4980**	**17.0997**	**6,711.3588**	**80,578.7036**	**87,290.0624**	**469.7014**	**4.2263**	**100,292.0354**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Energy	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.2515	18,402.2515	0.3527	0.3374	18,511.6069
Mobile	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Waste						0.0000	0.0000		0.0000	0.0000	5,107.8068	0.0000	5,107.8068	301.8627	0.0000	12,654.3751
Water						0.0000	0.0000		0.0000	0.0000	1,603.5520	0.0000	1,603.5520	164.7002	3.8889	6,879.9567
Total	**112.0468**	**113.4071**	**92.4052**	**0.7686**	**58.1385**	**1.5120**	**59.6505**	**15.6018**	**1.4980**	**17.0997**	**6,711.3588**	**80,578.7036**	**87,290.0624**	**469.7014**	**4.2263**	**100,292.0354**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/1/2019	2/13/2019	5	32	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	1	15.00	15.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.9000e-003	0.0823	0.0314	8.0000e-005		3.4900e-003	3.4900e-003		3.2100e-003	3.2100e-003	0.0000	7.0977	7.0977	2.2500e-003	0.0000	7.1538
Total	**6.9000e-003**	**0.0823**	**0.0314**	**8.0000e-005**		**3.4900e-003**	**3.4900e-003**		**3.2100e-003**	**3.2100e-003**	**0.0000**	**7.0977**	**7.0977**	**2.2500e-003**	**0.0000**	**7.1538**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0600e-003	0.0308	5.6100e-003	6.0000e-005	1.4400e-003	2.2000e-004	1.6600e-003	4.1000e-004	2.1000e-004	6.3000e-004	0.0000	5.9932	5.9932	5.8000e-004	0.0000	6.0078
Worker	1.6400e-003	1.2300e-003	0.0126	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.8026	2.8026	9.0000e-005	0.0000	2.8049
Total	**2.7000e-003**	**0.0321**	**0.0182**	**9.0000e-005**	**4.4200e-003**	**2.4000e-004**	**4.6600e-003**	**1.2000e-003**	**2.3000e-004**	**1.4400e-003**	**0.0000**	**8.7958**	**8.7958**	**6.7000e-004**	**0.0000**	**8.8127**

3.2 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.9000e-003	0.0823	0.0314	8.0000e-005		3.4900e-003	3.4900e-003		3.2100e-003	3.2100e-003	0.0000	7.0977	7.0977	2.2500e-003	0.0000	7.1538
Total	**6.9000e-003**	**0.0823**	**0.0314**	**8.0000e-005**		**3.4900e-003**	**3.4900e-003**		**3.2100e-003**	**3.2100e-003**	**0.0000**	**7.0977**	**7.0977**	**2.2500e-003**	**0.0000**	**7.1538**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0600e-003	0.0308	5.6100e-003	6.0000e-005	1.4400e-003	2.2000e-004	1.6600e-003	4.1000e-004	2.1000e-004	6.3000e-004	0.0000	5.9932	5.9932	5.8000e-004	0.0000	6.0078
Worker	1.6400e-003	1.2300e-003	0.0126	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.8026	2.8026	9.0000e-005	0.0000	2.8049
Total	**2.7000e-003**	**0.0321**	**0.0182**	**9.0000e-005**	**4.4200e-003**	**2.4000e-004**	**4.6600e-003**	**1.2000e-003**	**2.3000e-004**	**1.4400e-003**	**0.0000**	**8.7958**	**8.7958**	**6.7000e-004**	**0.0000**	**8.8127**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Unmitigated	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20,621.34	17,790.96	9165.04	71,784,688	71,784,688
Government Office Building	6,704.40	0.00	0.00	9,483,932	9,483,932
Office Park	15,078.96	3,816.28	1768.52	33,496,326	33,496,326
Refrigerated Warehouse-No Rail	10,004.40	10,004.40	10004.40	38,651,659	38,651,659
Total	52,409.10	31,611.64	20,937.96	153,416,606	153,416,606

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Government Office Building	14.70	6.60	6.60	33.00	62.00	5.00	50	34	16
Office Park	14.70	6.60	6.60	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No Rail	14.70	6.60	6.60	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Government Office Building	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.25 15	18,402.25 15	0.3527	0.3374	18,511.60 69
NaturalGas Unmitigated	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.25 15	18,402.25 15	0.3527	0.3374	18,511.60 69

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGa s Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	2.81286e +008	1.5167	13.7885	11.5824	0.0827		1.0479	1.0479		1.0479	1.0479	0.0000	15,010.48 47	15,010.48 47	0.2877	0.2752	15,099.68 45
Government Office Building	9.657e +006	0.0521	0.4734	0.3976	2.8400e-003		0.0360	0.0360		0.0360	0.0360	0.0000	515.3343	515.3343	9.8800e-003	9.4500e-003	518.3967
Office Park	5.30091e +007	0.2858	2.5985	2.1827	0.0156		0.1975	0.1975		0.1975	0.1975	0.0000	2,828.765 3	2,828.765 3	0.0542	0.0519	2,845.575 3
Refrigerated Warehouse-No Rail	893250	4.8200e-003	0.0438	0.0368	2.6000e-004		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	47.6672	47.6672	9.1000e-004	8.7000e-004	47.9505
Total		**1.8595**	**16.9042**	**14.1995**	**0.1014**		**1.2847**	**1.2847**		**1.2847**	**1.2847**	**0.0000**	**18,402.25 15**	**18,402.25 15**	**0.3527**	**0.3374**	**18,511.60 69**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	2.81286e+008	1.5167	13.7885	11.5824	0.0827		1.0479	1.0479		1.0479	1.0479	0.0000	15,010.4847	15,010.4847	0.2877	0.2752	15,099.6845
Government Office Building	9.657e+006	0.0521	0.4734	0.3976	2.8400e-003		0.0360	0.0360		0.0360	0.0360	0.0000	515.3343	515.3343	9.8800e-003	9.4500e-003	518.3967
Office Park	5.30091e+007	0.2858	2.5985	2.1827	0.0156		0.1975	0.1975		0.1975	0.1975	0.0000	2,828.7653	2,828.7653	0.0542	0.0519	2,845.5753
Refrigerated Warehouse-No Rail	893250	4.8200e-003	0.0438	0.0368	2.6000e-004		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	47.6672	47.6672	9.1000e-004	8.7000e-004	47.9505
Total		**1.8595**	**16.9042**	**14.1995**	**0.1014**		**1.2847**	**1.2847**		**1.2847**	**1.2847**	**0.0000**	**18,402.2515**	**18,402.2515**	**0.3527**	**0.3374**	**18,511.6069**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.18876e+008	0.0000	0.0000	0.0000	0.0000
Government Office Building	6.7488e+006	0.0000	0.0000	0.0000	0.0000
Office Park	2.71328e+007	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	1.48339e+008	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.18876e +008	0.0000	0.0000	0.0000	0.0000
Government Office Building	6.7488e +006	0.0000	0.0000	0.0000	0.0000
Office Park	2.71328e +007	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	1.48339e +008	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Unmitigated	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	15.6431					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	87.8738					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0188	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Total	**103.5357**	**1.8500e-003**	**0.2054**	**2.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**0.4020**	**0.4020**	**1.0400e-003**	**0.0000**	**0.4279**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	15.6431					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	87.8738					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0188	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Total	**103.5357**	**1.8500e-003**	**0.2054**	**2.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**0.4020**	**0.4020**	**1.0400e-003**	**0.0000**	**0.4279**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1,603.552 0	164.7002	3.8889	6,879.956 7
Unmitigated	1,603.552 0	164.7002	3.8889	6,879.956 7

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3116.79 / 0	988.8129	101.5606	2.3981	4,242.450 4
Government Office Building	147.008 / 90.1018	46.6389	4.7903	0.1131	200.1018
Office Park	413.586 / 253.488	131.2119	13.4767	0.3182	562.9578
Refrigerated Warehouse-No Rail	1377.09 / 0	436.8883	44.8726	1.0595	1,874.446 7
Total		**1,603.552 0**	**164.7002**	**3.8889**	**6,879.956 7**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3116.79 / 0	988.8129	101.5606	2.3981	4,242.4504
Government Office Building	147.008 / 90.1018	46.6389	4.7903	0.1131	200.1018
Office Park	413.586 / 253.488	131.2119	13.4767	0.3182	562.9578
Refrigerated Warehouse-No Rail	1377.09 / 0	436.8883	44.8726	1.0595	1,874.4467
Total		**1,603.5520**	**164.7002**	**3.8889**	**6,879.9567**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5,107.806 8	301.8627	0.0000	12,654.37 51
Unmitigated	5,107.806 8	301.8627	0.0000	12,654.37 51

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	16712.7	3,392.531 1	200.4929	0.0000	8,404.852 3
Government Office Building	688.2	139.6984	8.2559	0.0000	346.0968
Office Park	2164.11	439.2948	25.9616	0.0000	1,088.334 2
Refrigerated Warehouse-No Rail	5597.7	1,136.282 5	67.1524	0.0000	2,815.091 8
Total		**5,107.806 8**	**301.8627**	**0.0000**	**12,654.37 51**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	16712.7	3,392.531 1	200.4929	0.0000	8,404.852 3
Government Office Building	688.2	139.6984	8.2559	0.0000	346.0968
Office Park	2164.11	439.2948	25.9616	0.0000	1,088.334 2
Refrigerated Warehouse-No Rail	5597.7	1,136.282 5	67.1524	0.0000	2,815.091 8
Total		**5,107.806 8**	**301.8627**	**0.0000**	**12,654.37 51**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Crows Landing Operational
Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	740.00	1000sqft	68.00	740,000.00	0
Office Park	2,327.00	1000sqft	78.00	2,327,000.00	0
General Light Industry	13,478.00	1000sqft	767.00	13,478,000.00	0
Refrigerated Warehouse-No Rail	5,955.00	1000sqft	349.00	5,955,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2045
Utility Company	Turlock Irrigation District				
CO2 Intensity (lb/MWhr)	790	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - TID provides electrical services and PG&E provides natural gas services to the region. Used TID for Utility Information as TID intensity factors are higher.

Land Use - Traffic report and land use plan

Construction Phase - no construction for this run

Off-road Equipment - no construction for this run

Trips and VMT - no construction for this run

Vehicle Trips - traffic report trip rates for all land uses

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Water And Wastewater -

Solid Waste -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	155,000.00	32.00
tblConstructionPhase	PhaseEndDate	2/15/2613	2/13/2019
tblLandUse	LotAcreage	16.99	68.00
tblLandUse	LotAcreage	53.42	78.00
tblLandUse	LotAcreage	309.41	767.00
tblLandUse	LotAcreage	136.71	349.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	3,688.00	15.00
tblTripsAndVMT	WorkerTripNumber	9,143.00	15.00
tblVehicleTrips	WD_TR	6.97	1.53
tblVehicleTrips	WD_TR	68.93	9.06
tblVehicleTrips	WD_TR	11.42	6.48

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	9.6100e-003	0.1143	0.0496	1.7000e-004	4.4200e-003	3.7300e-003	8.1500e-003	1.2100e-003	3.4400e-003	4.6500e-003	0.0000	15.8935	15.8935	2.9200e-003	0.0000	15.9666
Maximum	**9.6100e-003**	**0.1143**	**0.0496**	**1.7000e-004**	**4.4200e-003**	**3.7300e-003**	**8.1500e-003**	**1.2100e-003**	**3.4400e-003**	**4.6500e-003**	**0.0000**	**15.8935**	**15.8935**	**2.9200e-003**	**0.0000**	**15.9666**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	9.6100e-003	0.1143	0.0496	1.7000e-004	4.4200e-003	3.7300e-003	8.1500e-003	1.2100e-003	3.4400e-003	4.6500e-003	0.0000	15.8935	15.8935	2.9200e-003	0.0000	15.9666
Maximum	**9.6100e-003**	**0.1143**	**0.0496**	**1.7000e-004**	**4.4200e-003**	**3.7300e-003**	**8.1500e-003**	**1.2100e-003**	**3.4400e-003**	**4.6500e-003**	**0.0000**	**15.8935**	**15.8935**	**2.9200e-003**	**0.0000**	**15.9666**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Crows Landing Operational - Stanislaus County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2019**	**3-31-2019**	0.1220	0.1220
		Highest	0.1220	0.1220

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Energy	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	126,296.6074	126,296.6074	4.3134	1.1568	126,749.1761
Mobile	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Waste						0.0000	0.0000		0.0000	0.0000	5,107.8068	0.0000	5,107.8068	301.8627	0.0000	12,654.3751
Water						0.0000	0.0000		0.0000	0.0000	1,603.5520	10,231.3857	11,834.9377	165.0758	3.9666	17,143.8886
Total	**112.0468**	**113.4071**	**92.4052**	**0.7686**	**58.1385**	**1.5120**	**59.6505**	**15.6018**	**1.4980**	**17.0997**	**6,711.3588**	**198,704.4451**	**205,415.8039**	**474.0377**	**5.1235**	**218,793.5364**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Energy	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	126,296.6074	126,296.6074	4.3134	1.1568	126,749.1761
Mobile	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Waste						0.0000	0.0000		0.0000	0.0000	5,107.8068	0.0000	5,107.8068	301.8627	0.0000	12,654.3751
Water						0.0000	0.0000		0.0000	0.0000	1,603.5520	10,231.3857	11,834.9377	165.0758	3.9666	17,143.8886
Total	**112.0468**	**113.4071**	**92.4052**	**0.7686**	**58.1385**	**1.5120**	**59.6505**	**15.6018**	**1.4980**	**17.0997**	**6,711.3588**	**198,704.4451**	**205,415.8039**	**474.0377**	**5.1235**	**218,793.5364**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	1/1/2019	2/13/2019	5	32	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	1	15.00	15.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.9000e-003	0.0823	0.0314	8.0000e-005		3.4900e-003	3.4900e-003		3.2100e-003	3.2100e-003	0.0000	7.0977	7.0977	2.2500e-003	0.0000	7.1538
Total	**6.9000e-003**	**0.0823**	**0.0314**	**8.0000e-005**		**3.4900e-003**	**3.4900e-003**		**3.2100e-003**	**3.2100e-003**	**0.0000**	**7.0977**	**7.0977**	**2.2500e-003**	**0.0000**	**7.1538**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0600e-003	0.0308	5.6100e-003	6.0000e-005	1.4400e-003	2.2000e-004	1.6600e-003	4.1000e-004	2.1000e-004	6.3000e-004	0.0000	5.9932	5.9932	5.8000e-004	0.0000	6.0078
Worker	1.6400e-003	1.2300e-003	0.0126	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.8026	2.8026	9.0000e-005	0.0000	2.8049
Total	**2.7000e-003**	**0.0321**	**0.0182**	**9.0000e-005**	**4.4200e-003**	**2.4000e-004**	**4.6600e-003**	**1.2000e-003**	**2.3000e-004**	**1.4400e-003**	**0.0000**	**8.7958**	**8.7958**	**6.7000e-004**	**0.0000**	**8.8127**

3.2 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.9000e-003	0.0823	0.0314	8.0000e-005		3.4900e-003	3.4900e-003		3.2100e-003	3.2100e-003	0.0000	7.0977	7.0977	2.2500e-003	0.0000	7.1538
Total	**6.9000e-003**	**0.0823**	**0.0314**	**8.0000e-005**		**3.4900e-003**	**3.4900e-003**		**3.2100e-003**	**3.2100e-003**	**0.0000**	**7.0977**	**7.0977**	**2.2500e-003**	**0.0000**	**7.1538**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0600e-003	0.0308	5.6100e-003	6.0000e-005	1.4400e-003	2.2000e-004	1.6600e-003	4.1000e-004	2.1000e-004	6.3000e-004	0.0000	5.9932	5.9932	5.8000e-004	0.0000	6.0078
Worker	1.6400e-003	1.2300e-003	0.0126	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.8026	2.8026	9.0000e-005	0.0000	2.8049
Total	**2.7000e-003**	**0.0321**	**0.0182**	**9.0000e-005**	**4.4200e-003**	**2.4000e-004**	**4.6600e-003**	**1.2000e-003**	**2.3000e-004**	**1.4400e-003**	**0.0000**	**8.7958**	**8.7958**	**6.7000e-004**	**0.0000**	**8.8127**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687
Unmitigated	6.6517	96.5011	78.0002	0.6672	58.1385	0.2266	58.3650	15.6018	0.2125	15.8143	0.0000	62,176.0500	62,176.0500	2.7848	0.0000	62,245.6687

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	20,621.34	17,790.96	9165.04	71,784,688	71,784,688
Government Office Building	6,704.40	0.00	0.00	9,483,932	9,483,932
Office Park	15,078.96	3,816.28	1768.52	33,496,326	33,496,326
Refrigerated Warehouse-No Rail	10,004.40	10,004.40	10004.40	38,651,659	38,651,659
Total	52,409.10	31,611.64	20,937.96	153,416,606	153,416,606

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Government Office Building	14.70	6.60	6.60	33.00	62.00	5.00	50	34	16
Office Park	14.70	6.60	6.60	33.00	48.00	19.00	82	15	3
Refrigerated Warehouse-No Rail	14.70	6.60	6.60	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Government Office Building	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Office Park	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415
Refrigerated Warehouse-No Rail	0.563336	0.028772	0.182262	0.087992	0.007827	0.003289	0.025976	0.093152	0.001800	0.000871	0.003777	0.000531	0.000415

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	107,894.3559	107,894.3559	3.9607	0.8195	108,237.5692
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	107,894.3559	107,894.3559	3.9607	0.8195	108,237.5692
NaturalGas Mitigated	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.2515	18,402.2515	0.3527	0.3374	18,511.6069
NaturalGas Unmitigated	1.8595	16.9042	14.1995	0.1014		1.2847	1.2847		1.2847	1.2847	0.0000	18,402.2515	18,402.2515	0.3527	0.3374	18,511.6069

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	2.81286e+008	1.5167	13.7885	11.5824	0.0827		1.0479	1.0479		1.0479	1.0479	0.0000	15,010.4847	15,010.4847	0.2877	0.2752	15,099.6845
Government Office Building	9.657e+006	0.0521	0.4734	0.3976	2.8400e-003		0.0360	0.0360		0.0360	0.0360	0.0000	515.3343	515.3343	9.8800e-003	9.4500e-003	518.3967
Office Park	5.30091e+007	0.2858	2.5985	2.1827	0.0156		0.1975	0.1975		0.1975	0.1975	0.0000	2,828.7653	2,828.7653	0.0542	0.0519	2,845.5753
Refrigerated Warehouse-No Rail	893250	4.8200e-003	0.0438	0.0368	2.6000e-004		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	47.6672	47.6672	9.1000e-004	8.7000e-004	47.9505
Total		**1.8595**	**16.9042**	**14.1995**	**0.1014**		**1.2847**	**1.2847**		**1.2847**	**1.2847**	**0.0000**	**18,402.2515**	**18,402.2515**	**0.3527**	**0.3374**	**18,511.6069**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	2.81286e+008	1.5167	13.7885	11.5824	0.0827		1.0479	1.0479		1.0479	1.0479	0.0000	15,010.4847	15,010.4847	0.2877	0.2752	15,099.6845
Government Office Building	9.657e+006	0.0521	0.4734	0.3976	2.8400e-003		0.0360	0.0360		0.0360	0.0360	0.0000	515.3343	515.3343	9.8800e-003	9.4500e-003	518.3967
Office Park	5.30091e+007	0.2858	2.5985	2.1827	0.0156		0.1975	0.1975		0.1975	0.1975	0.0000	2,828.7653	2,828.7653	0.0542	0.0519	2,845.5753
Refrigerated Warehouse-No Rail	893250	4.8200e-003	0.0438	0.0368	2.6000e-004		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	47.6672	47.6672	9.1000e-004	8.7000e-004	47.9505
Total		**1.8595**	**16.9042**	**14.1995**	**0.1014**		**1.2847**	**1.2847**		**1.2847**	**1.2847**	**0.0000**	**18,402.2515**	**18,402.2515**	**0.3527**	**0.3374**	**18,511.6069**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.18876e+008	42,597.7705	1.5637	0.3235	42,733.2745
Government Office Building	6.7488e+006	2,418.3513	0.0888	0.0184	2,426.0441
Office Park	2.71328e+007	9,722.7197	0.3569	0.0738	9,753.6478
Refrigerated Warehouse-No Rail	1.48339e+008	53,155.5144	1.9513	0.4037	53,324.6028
Total		**107,894.3559**	**3.9607**	**0.8195**	**108,237.5692**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	1.18876e +008	42,597.77 05	1.5637	0.3235	42,733.27 45
Government Office Building	6.7488e +006	2,418.351 3	0.0888	0.0184	2,426.044 1
Office Park	2.71328e +007	9,722.719 7	0.3569	0.0738	9,753.647 8
Refrigerated Warehouse-No Rail	1.48339e +008	53,155.51 44	1.9513	0.4037	53,324.60 28
Total		**107,894.3 559**	**3.9607**	**0.8195**	**108,237.5 692**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Unmitigated	103.5357	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	15.6431					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	87.8738					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0188	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Total	**103.5357**	**1.8500e-003**	**0.2054**	**2.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**0.4020**	**0.4020**	**1.0400e-003**	**0.0000**	**0.4279**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	15.6431					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	87.8738					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0188	1.8500e-003	0.2054	2.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	0.4020	0.4020	1.0400e-003	0.0000	0.4279
Total	**103.5357**	**1.8500e-003**	**0.2054**	**2.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**0.4020**	**0.4020**	**1.0400e-003**	**0.0000**	**0.4279**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	11,834.93 77	165.0758	3.9666	17,143.88 86
Unmitigated	11,834.93 77	165.0758	3.9666	17,143.88 86

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3116.79 / 0	7,032.160 3	101.7824	2.4440	10,305.02 17
Government Office Building	147.008 / 90.1018	444.6870	4.8049	0.1161	599.4161
Office Park	413.586 / 253.488	1,251.063 1	13.5178	0.3267	1,686.371 3
Refrigerated Warehouse-No Rail	1377.09 / 0	3,107.027 3	44.9706	1.0798	4,553.079 4
Total		**11,834.93 77**	**165.0758**	**3.9666**	**17,143.88 86**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	3116.79 / 0	7,032.1603	101.7824	2.4440	10,305.0217
Government Office Building	147.008 / 90.1018	444.6870	4.8049	0.1161	599.4161
Office Park	413.586 / 253.488	1,251.0631	13.5178	0.3267	1,686.3713
Refrigerated Warehouse-No Rail	1377.09 / 0	3,107.0273	44.9706	1.0798	4,553.0794
Total		**11,834.9377**	**165.0758**	**3.9666**	**17,143.8886**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5,107.806 8	301.8627	0.0000	12,654.37 51
Unmitigated	5,107.806 8	301.8627	0.0000	12,654.37 51

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	16712.7	3,392.531 1	200.4929	0.0000	8,404.852 3
Government Office Building	688.2	139.6984	8.2559	0.0000	346.0968
Office Park	2164.11	439.2948	25.9616	0.0000	1,088.334 2
Refrigerated Warehouse-No Rail	5597.7	1,136.282 5	67.1524	0.0000	2,815.091 8
Total		**5,107.806 8**	**301.8627**	**0.0000**	**12,654.37 51**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	16712.7	3,392.531 1	200.4929	0.0000	8,404.852 3
Government Office Building	688.2	139.6984	8.2559	0.0000	346.0968
Office Park	2164.11	439.2948	25.9616	0.0000	1,088.334 2
Refrigerated Warehouse-No Rail	5597.7	1,136.282 5	67.1524	0.0000	2,815.091 8
Total		**5,107.806 8**	**301.8627**	**0.0000**	**12,654.37 51**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX G

Black Water Consulting Engineers Technical Memorandum

Technical Memorandum

To: Ken Irwin, City Manager; Michael H. Willett, Director of Public Works
From: Alison Furuya, P.E.; Jeff Black, P.E.

Subject: Potential Impacts to Patterson Wastewater Facilities from Crows Landing Industrial Business Park

Date: August 25, 2017

INTRODUCTION

Stanislaus County (County) is proposing to reuse the former Crows Landing Air Facility property and develop the Crows Landing Industrial Business Park (CLIBP). The CLIBP is a planned 1,528 acre business park consisting of public facilities, logistics, industrial, business park, and general aviation land uses. The County is seeking permission to convey the wastewater from the CLIBP to City of Patterson (City) facilities for conveyance, treatment and disposal. This technical memorandum (TM) evaluates the potential impacts of the CLIBP project to the City wastewater collection system and Water Quality Control Facility (WQCF). The evaluation included:

1. A review of the City's Wastewater Master Plan WWMP) [1] and other recently completed documents related to the City's wastewater facilities.

2. A review of the Wastewater Flow and Load assumptions for the future Crows Landing Industrial Business Park development phases memorandum (CLIBP Wastewater Memo) [2], as well as previous documents relating to wastewater infrastructure for the CLIBP.

BACKGROUND

Crows Landing Industrial Business Park Project

The following is a brief summary of the wastewater information provided in the CLIBP Wastewater Memo. Wastewater flow and loading projections for the CLIBP were developed using the assumptions presented in Table 1.

Table 1 – CLIBP Wastewater Flow and Loading Assumptions

Parameter	Value
Airport Users - Dry Weather Loading Factor	4 gpc/day
General Land Users - Dry Weather Loading Factor	1,000 gpd/acre
Wet Weather Loading Factor, Infiltration/Inflow (I/I)	100 gpd/acre
Dry Weather Peaking Factor	3
Raw Wastewater Constituents	
Biochemical Oxygen Demand (BOD_5)	300 mg/L
Total Suspended Solids (TSS)	300 mg/L
Total Kjeldahl Nitrogen (TKN)	50 mg/L

The CLIBP plan area infrastructure and land use development is anticipated to occur over three ten-year phases. Table 2 summarizes the projected flows and loads associated with each phase and buildout of the CLIBP.

Table 2 – CLIBP Wastewater Flow and Load Projections

Parameter	Units	Phase 1 2018-2028	Phase 2 2029-2039	Phase 3 2049-2050	Total (Buildout)
Flow					
Average Dry Weather Flow (ADWF)	mgd	0.394	0.223	0.274	0.891
Peak Dry Weather Flow (PDWF)	mgd	1.182	0.669	0.822	2.673
Peak Wet Weather Flow (PWWF)	mgd	1.259	0.691	0.849	2.799
Loads					
Average BOD_5 Load	lbs/day	986	558	686	2,229
Peak BOD_5 Load	lbs/day	1,282	725	891	2,898
Average TSS Load	lbs/day	986	558	686	2,229
Peak TSS Load	lbs/day	1,282	725	891	2,898
Average TKN Load	lbs/day	164	93	114	372
Peak TKN Load	lbs/day	214	121	149	484

City of Patterson Historical Wastewater Flows and Loads

Wastewater flow and influent data for the past five years were reviewed and are summarized in Tables 3 and 4. Several influent BOD and TSS results were unusually high in 2015 and 2016. These results are not included in the data summarized in Table 5.

Table 3 – WQCF Average Dry Weather Flow Summary

	WQCF Influent Flow (mgd)				
Month	**2012**	**2013**	**2014**	**2015**	**2016**
June	1.55	1.41	1.45	1.42	1.41
July	1.38	1.41	1.48	1.49	1.39
August	1.43	1.45	1.48	1.41	1.43
Average	**1.45**	**1.42**	**1.47**	**1.44**	**1.41**
5-yr Average = 1.44 mgd					

Table 4 – WQCF Influent BOD and TSS Summary

Parameter	Units	2012	2013	2014	2015	2016	Average
BOD_5							
Average	mg/L	280	259	287	366	245	**287**
Minimum	mg/L	180	140	120	160	120	**144**
Maximum	mg/L	660	520	710	900	970	**752**
BOD_5 Load							
Average	lbs/d	3,331	3,121	3,500	4,315	2,876	**3,429**
Minimum	lbs/d	2,106	1,708	1,477	1,829	1,380	**1,700**
Maximum	lbs/d	7,211	6,462	8,379	9,833	10,792	**8,535**
TSS							
Average	mg/L	225	235	295	319	208	**256**
Minimum	mg/L	20	44	110	44	72	**58**
Maximum	mg/L	810	610	1,000	820	720	**792**
TSS Load							
Average	lbs/d	2,662	2,834	3,577	3,781	2,436	**3,058**
Minimum	lbs/d	228	522	1,336	540	862	**698**
Maximum	lbs/d	8,850	7,336	11,819	9,708	8,010	**9,145**

City of Patterson Projected Growth

For this evaluation, wastewater flow was estimated to increase at the same rate as projected population growth rates. The City 2015-2023 Housing Element Updated, adopted February 2016 [3] presented population projections and average annual growth rates for the City and Stanislaus County. These population projections are summarized in Table 5.

Table 5 – Patterson and Stanislaus County Population Projections

Year	Patterson Population	Patterson Average Annual Growth Rate	Stanislaus County Population	Stanislaus County Average Annual Growth Rate
2010	20,413		514,453	
2015	25,065	4.20%	551,668	1.40%
2020	30,375	3.90%	594,146	1.50%
2025	35,685	3.30%	636,625	1.40%
2030	40,995	2.80%	679,403	1.30%
2035	43,559	1.20%	721,582	1.20%
2040	46,124	1.20%	764,060	1.20%
Change/Average	25,711	2.8%	249,607	1.3%

Source: City of Patterson 2015-2023 Housing Element Updated, adopted February 2, 2016 [3]

Projected wastewater flows for the WQCF based on the growth rates presented in Table 5 for the City, with the addition of contributions from Diablo Grande and the CLIBP, are summarized in Table 6. A total ADWF of 1.47 mgd, the maximum ADWF measured for the past 5 years, was used as the starting condition. Average annual growth rates from year 2040-2050 were assumed to be consistent with the growth rate of 1.2% for 2036-2040. The projected buildout flow for the City is also included in the table, and is from the WWMP.

Table 6 – WQCF ADWF Flow Projections

Year/Condition	Average Annual Growth Rate [a]	Projected City ADWF (mgd)	Projected Diablo Grande ADWF (mgd)	Projected Total ADWF w/o CLIBP (mgd)	Projected CLIBP ADWF (mgd)	Projected Total ADWF with CLIBP (mgd)
Existing (2016)		1.40	0.04	1.44	-	1.44
2018	3.9%	1.51	0.05	1.56	0.39	1.96
2029	2.8 - 3.3%	2.15	0.11	2.25	0.62	2.87
2040	1.2 - 2.8%	2.49	0.16	2.65	0.89	3.54
2050	1.2%	2.80	0.22	3.02	0.89	3.91
Buildout	-	5.54	0.75	6.29	0.89	7.18

[a] Average annual growth rate assumptions are based on the average annual growth rates for Patterson presented in Table 6.
[b] Assumes an ADWF of 0.032 mgd for Diablo Grande in 2009-2010, with annual increases of 5,250 gpd per year.

The City receives wastewater from the Diablo Grande development, located west of the City limits. The WWMP reported an ADWF for Diablo Grande of 0.032 mgd, based on flow data from 2009-2010. This flow was used as a baseline and was increased by 5,250 gpd per year, based on the assumption that 30 housing units have been and will be added per year, with an average flow of 175 gallons per day (gpd) per unit. This growth assumption for Diablo Grande resulted in an estimated ADWF of 0.04 mgd for

Diablo Grande in 2016. The City is in the process of collecting flow data for Diablo Grande. The most recently collected data indicates that Diablo Grande is discharging average flows in the range of 350,000 to 420,000 gpd, which is significantly higher than the estimate shown in Table 6.

POTENTIAL IMPACTS TO COLLECTION SYSTEM

The CLIBP Wastewater Memo describes the installation of a temporary connection to the existing Western Hills Water District (WHWD) 18-inch sewer trunk line at the intersection of Ward Avenue and Marshall Road to convey CLIBP Phase 1 flows to the City collection system. This temporary connection will be replaced with a permanent connection to the proposed South Patterson Trunk Sewer (SPTS) at the intersection of Bartch Avenue and Ward Avenue, as part of CLIBP Phase 2.

The hydraulic model, developed as part of the WWMP, was evaluated for the existing trunk sewers on Ward Avenue, M Street and Ward Avenue (referred to as the Central Trunk Sewer (CTS) in this TM), and the proposed SPTS. The following two scenarios were executed to determine if the proposed CLIBP wastewater connections could be accommodated by the existing and proposed City collection system.

Scenario 1: CLIBP Phase 1 flows added to southern end of Ward Avenue Trunk Sewer. Diablo Grande ADWF of 0.10 mgd. Complete development of known potential developments in the City, as shown in Figure 1. The developments include: Villages of Patterson, Patterson Gardens, Keystone Business Park, West Ridge Business Park, Villa del Lago, Arambel Business Park, and other small developments.

Scenario 2: CLIBP Buildout flows added to the proposed SPTS. Diablo Grande buildout flows added to the proposed SPTS. Complete development of City General Plan areas.

The City wastewater loads assigned to the manholes were calculated using the method presented in the WWMP, which includes the use of a variable diurnal peaking factor (DPF) to calculate PDWF and an I/I factor based on area served to calculate PWWF. Consistent with the WWMP, Diablo Grande flows were assigned a constant peaking factor of 3.1 and an I/I factor of 300 gpd/ac over an area of 5,070 acres.

Detailed information regarding the hydraulic model, including a listing of the manhole IDs, wastewater loads, and capacity in the trunk sewers on Ward Avenue, Walnut Avenue, M Street, and the SPTS is provided in Appendix A. An overview of the hydraulic model results is provided below.

- As detailed in the WWMP, the hydraulic limitations of pipe segment E5-6:E5:5 on M Street due to a reverse slope were confirmed, and this pipe segment is recommended for replacement.
- The Ward Avenue trunk sewer does not have sufficient capacity to accommodate the known areas in Patterson for potential growth, shown in Figure 1, and the addition of CLIBP Phase 1 flows. To accommodate the CLIBP flows, the existing 21-inch sections would need to be upsized to 24-inches.
- PWWF from Diablo Grande and potential developments in the City are critical to determining the remaining available capacity in the Ward Avenue Trunk Sewer for the CLIBP.
- The SPTS, as proposed in the WWMP, has sufficient capacity to accommodate the projected CLIBP buildout flows. Projected d/D values in the SPTS range from 0.42-0.60.

POTENTIAL IMPACTS TO WASTEWATER QUALITY CONTROL FACILITY

The existing reliable capacity and projected capacity following the completion of future expansion phases for the WQCF are summarized in Table 8. This information originated from the WWMP, with slight adjustments to provide more detail on capacity impacts associated with decommissioning existing facilities as they become antiquated. Additionally, the existing reliable capacity for the WQCF differs from the permitted capacity. The WQCF is currently regulated under Regional Water Quality Control Board (Regional Board) Waste Discharge Requirements Order R5-2007-0147 (WDRs). The WDRs include effluent nitrogen limits which have been challenging for the older treatment facilities at the WQCF to meet. Therefore, the City considers the reliable capacity of the WQCF to be less than the permitted capacity to ensure compliance with the WDRs. Based on the information presented in Table 7, the addition of the CLIBP flows would require and additional expansion project after Phase V.

Table 7 – WQCF Existing and Anticipated Capacity

Condition		Reliable Capacity (mgd)	Total Reliable Capacity (mgd)
Existing			1.85
North Activated Sludge Treatment System		0.6	
Advanced Integrated Pond System		0	
South Activated Sludge Treatment System			
	Treatment Train 1	1.25	
Completion of Phase III Expansion			3.1
North Activated Sludge Treatment System		0.6	
Advanced Integrated Pond System		0	
South Activated Sludge Treatment System			
	Treatment Train 1	1.25	
	Treatment Train 2	1.25	
Phase IV Expansion			4.25
North Activated Sludge Treatment System		0	
Advanced Integrated Pond System		0	
South Activated Sludge Treatment System			
	Treatment Train 1	1.25	
	Treatment Train 2	1.25	
	Treatment Train 3	1.75	
Phase V Expansion			6.5
North Activated Sludge Treatment System		0	
Advanced Integrated Pond System		0	
South Activated Sludge Treatment System			
	Treatment Train 1	1.25	
	Treatment Train 2	1.25	
	Treatment Train 3	2	
	Treatment Train 4	2	

Expansion phases are recommended to begin design and permitting seven years prior to reaching the reliable capacity of the facility and construction five years prior to reaching the reliable capacity of the facility. Table 8 presents estimates for the recommended construction completion time for Phase III and IV expansions. The flows to the WQCF are projected to exceed the existing reliable capacity of 1.85 mgd ADWF within the next five years and acceptance of wastewater from the CLIBP is not recommended until construction of Phase III has started. WQCF flows and development projections should be regularly updated to refine the timing for implementation of expansion projects.

Table 8 – Estimated Timing for WQCF Expansion Projects

Expansion Phase	Total Reliable Capacity after Expansion Phase Completed (mgd)	Recommended Year to Complete Construction	
		w/out CLIBP	w/ CLIBP
Existing	1.85	-	-
Phase III	3.1	2018	2017
Phase IV	4.25	2045	2028

Projected BOD, TSS, and TKN strength for the CLIBP are similar to historical WQCF influent concentrations and are not anticipated to be an issue.

DEVELOPER IMPACT FEES AND COST SHARING

Collection System

The WWMP provided cost estimates for construction of the SPTS. These costs are summarized in Table 9. Table 10 provides a summary of the wastewater loads which the SPTS is planned to accept.

Table 9 – Costs for South Patterson Trunk Sewer Components

Project Components	Base Cost
Junction Structure[a]	495,000
South Patterson Trunk Sewer	3,897,000
South Patterson Pump Station	640,000
South Patterson Force Main	635,000
Base Construction Cost	5,700,000
Probable Construction Cost [b]	8,379,000

[a] Base cost listed is half of the total cost because the junction structure will be for the North Patterson Trunk Sewer as well.

[b] Probable construction cost includes applying contingencies for planning and design (10%), construction management (10%), and construction (20%), to the Base Construction Cost to obtain a subtotal cost. An additional 5% contingency for program administration is applied to the subtotal cost to obtain the Probable Construction Cost.

Table 10 – South Patterson Trunk Sewer Design Wastewater Loads

Development Area	ADWF (gpd)
Diablo Grande	750,000
Crows Landing Industrial Business Park	891,000
Development in south Patterson	823,060
Projected ADWF Capacity Increase	2,464,060

Based on this information, incremental capacity is being provided at an approximate cost of \$3.40/gpd ADWF. This unit cost can be used as an initial guide for developing impact fees for the collection system.

Wastewater Quality Control Facility

A conceptual list of components for the Phase IV expansion project is provided in Table 11. Budgetary costs are included with the list. The costs provided are based on cost estimates for the Phase III expansion project. The cost estimate indicates that expansion of treatment and disposal capacity is approximately \$30/gpd ADWF.

Table 11 – Budgetary Phase IV Expansion Project Costs

Project Components	**Probable Construction Cost (in \$1,000,000)**
Influent Pump Station	5.00
South Activated Sludge Treatment System, Unit 3	6.00
Solids Handling Facilities	5.50
Effluent Pumping Facilities	2.50
Plant Water System Improvements	0.50
Stormwater/Site Drainage Improvements	1.00
Electrical and Controls	4.00
Demolition of NASTS facilities	1.00
Site Piping	1.00
Site Grading and Surfacing Improvements	1.00
Tertiary Filters	3.00
Disinfection Facilities	2.00
Odor Control	1.00
Percolation Pond Expansion	2.00
Base Construction Cost	35.50
10% Planning and design contingency	*3.55*
10% Construction management contingency	*3.55*
20% Construction contingency	*7.10*
Subtotal	49.70
5% Program Administration contingency	2.49
Total Project Cost	52.19
WQCF Capacity Increase	1.75 mgd
Cost per gallon capacity	\$30

[a] Percolation Pond Expansion cost includes land acquisition.

CLIBP Wastewater Cost Share Estimate

Table 12 presents an estimated cost share for the CLIBP for expanding the wastewater collection and WQCF facilities to accommodate the projected flows from the project. The total estimated CLIBP cost share is $29.8 million. The cost share does not include improvements to the existing City wastewater facilities that may be needed to accommodate CLIBP flows on a temporary basis.

Table 12 – Estimated CLIBP Cost Share for Expanding City Wastewater Facilities

Description	Value
Collection System Expansion Unit Cost	$3.40/gpd ADWF
WQCF Phase IV Expansion Project Unit Cost	$30/gpd ADWF
CLIBP Buildout ADWF	0.891 mgd
CLIBP Buildout Cost Share	$29.8M

SUMMARY

The findings from this evaluation are summarized below.

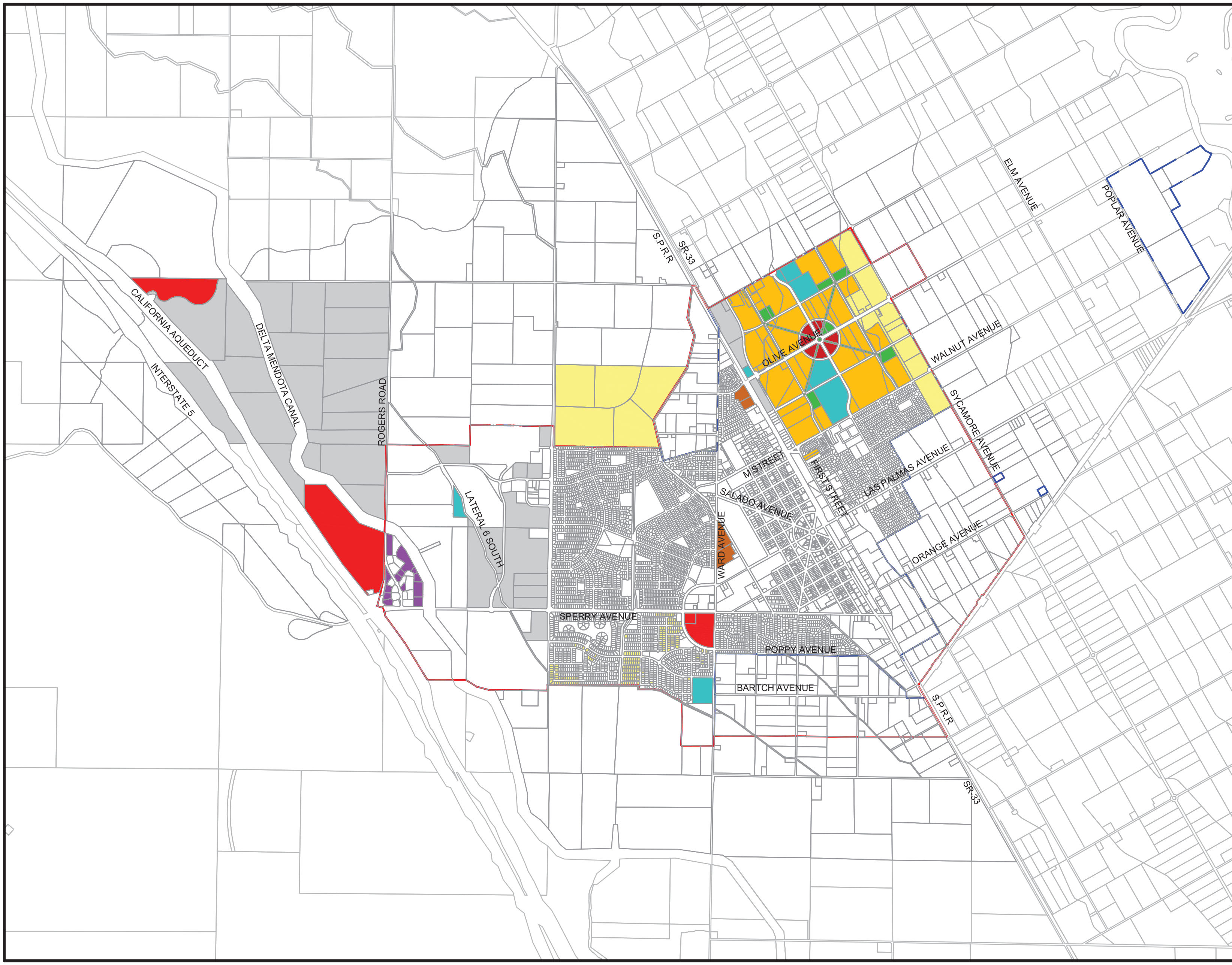
1. The existing collection system does not have sufficient capacity to accept the CLIBP Phase 1 flows and known potential developments in the City.
2. Recommended improvements to the collection system can be implemented to increase capacity in the existing system to accept CLIBP Phase 1 flows. These improvements include:
   a. Replacement of pipe segment E5-6:E5:5 on M Street, as previously identified in the WWMP.
   b. Upsizing of approximately 1,300 feet of 21-inch pipe in Ward Avenue.
3. The WQCF Phase III Expansion Project should be completed prior to accepting flow from the CLIBP. Accepting the CLIBP flows would be dependent on priority developments within the City.
4. The WQCF Phase IV Expansion Project should be planned for completion in the year 2028, if CLIBP wastewater is treated by the City.
5. The estimated CLIBP cost share for expanding the City wastewater facilities is $29.8 million.
6. The estimates presented in this TM are based on growth and flow assumptions. These assumptions should be reviewed regularly.

REFERENCES

[1] City of Patterson Wastewater Master Plan, prepared by Black Water Consulting Engineers, Inc. and NV5, April 2016

[2] Wastewater Flow and Load assumptions for the future Crows Landing Industrial Business Park development phases memorandum, prepared by AECOM, July 6, 2017

[3] City of Patterson 2015-2023 Housing Element Update, adopted February 2, 2016



LEGEND

RESIDENTIAL

- ER ESTATE RESIDENTIAL
- LDR LOW-DENSITY RESIDENTIAL
- MDR MEDIUM-DENSITY RESIDENTIAL
- HDR HIGH-DENSITY RESIDENTIAL
- DR DOWNTOWN RESIDENTIAL

COMMERCIAL

- HSC HIGHWAY SERVICE COMMERCIAL
- DC DOWNTOWN CORE
- GC GENERAL COMMERCIAL
- MU MIXED-USE
- MP MEDICAL PROFESSIONAL

INDUSTRIAL

- LI LIGHT INDUSTRIAL
- HI HEAVY INDUSTRIAL

PUBLIC

- P/QP PUBLIC / QUASI-PUBLIC
- P/OS PARKS / OPEN SPACE

BOUNDARY

- CL CITY LIMITS
- SOI SPHERE OF INFLUENCE

FIGURE 1

CITY OF PATTERSON
CLIBP SCENARIO
ADDITIONAL DEVELOPED PARCELS

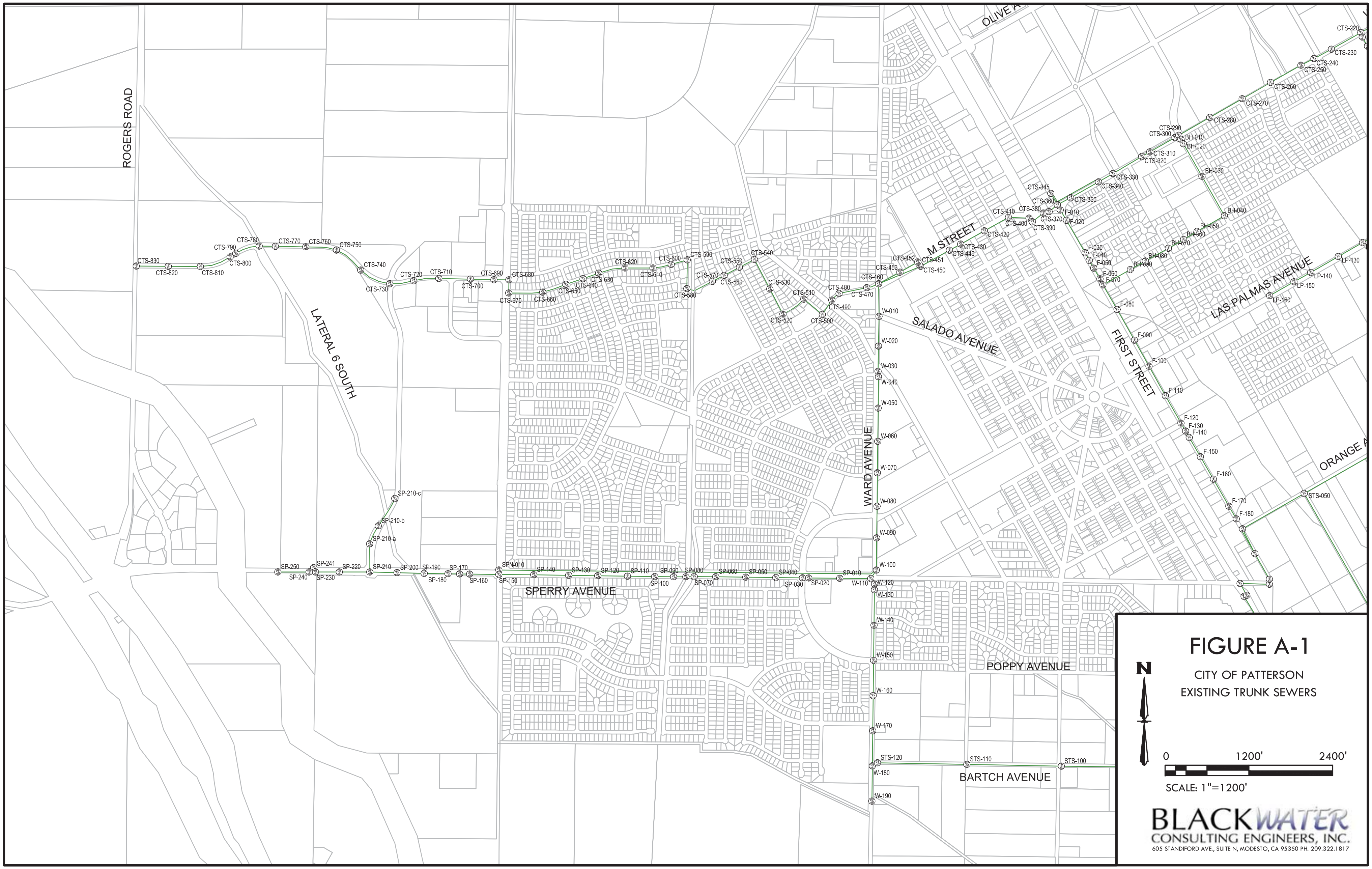
N

0 3000' 6000'
SCALE: 1"=3000'

BLACKWATER
CONSULTING ENGINEERS, INC.
605 STANDIFORD AVE., SUITE N, MODESTO, CA 95350 PH. 209.322.1817

I:\16125 CITY OF PATTERSON\TASKS\125-178 CLIBP EVALUATION\CAD\EXHIBITS\FIGURES\125_FIGURE 2.DWG PLOT: 8/8/2017 4:38:47 PM BY KEVIN WILLIAMS

APPENDIX A
HYDRAULIC MODEL RESULTS



I:\J16125 CITY OF PATTERSON\TASKS\125-178 CLIBP EVALUATION\CAD\EXHIBITS\FIGURES\125_FIGURE 3.DWG PLOT: 8/8/2017 4:24:58 PM BY KEVIN WILLIAMS

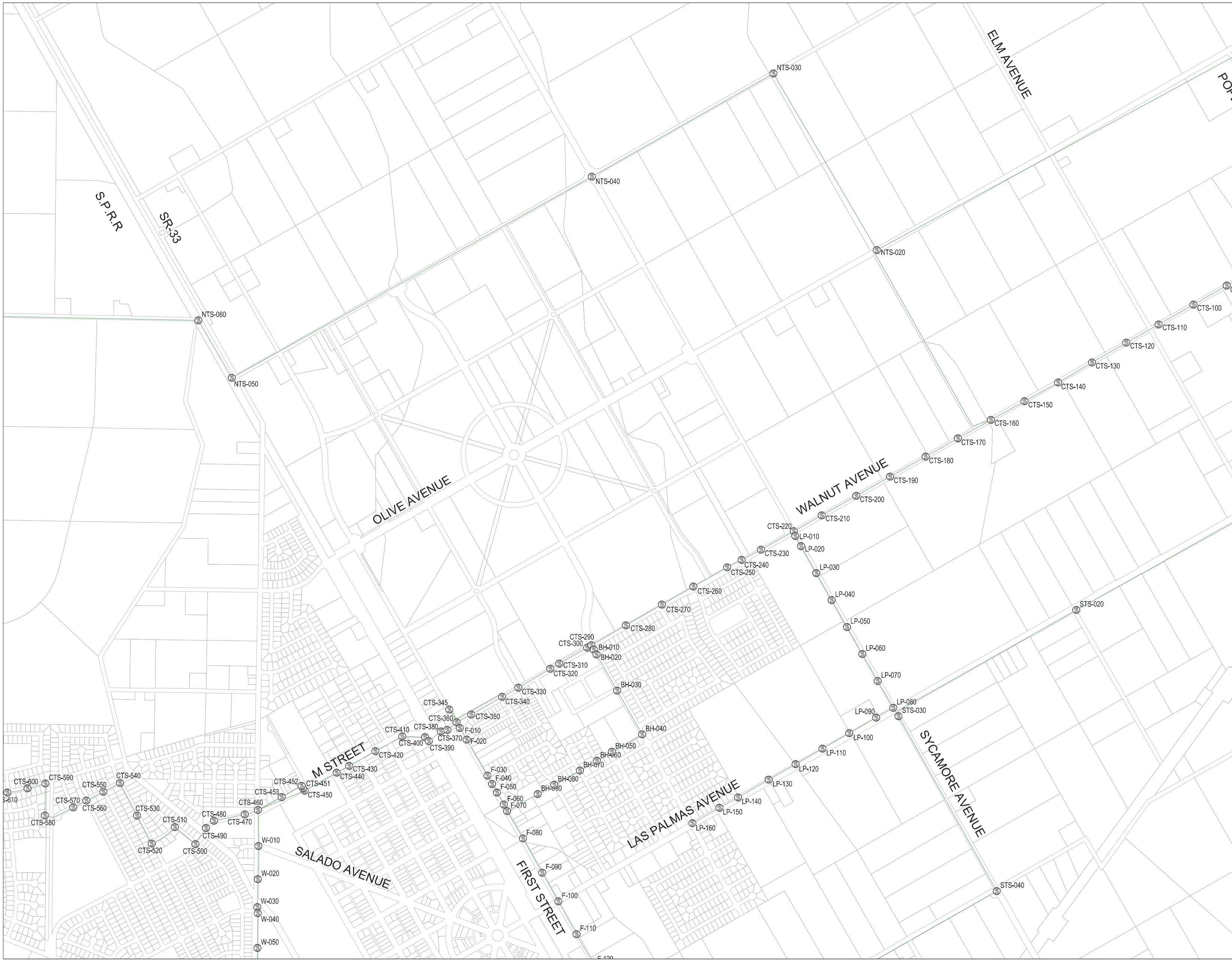


FIGURE A-2

CITY OF PATTERSON
EXISTING TRUNK SEWERS

N

0 1200' 2400'

SCALE: 1"=1200'

BLACKWATER
CONSULTING ENGINEERS, INC.
605 STANDIFORD AVE., SUITE N, MODESTO, CA 95350 PH. 209.322.1817

I:\16125 CITY OF PATTERSON\TASKS\125-178 CLIBP EVALUATION\CAD\EXHIBITS\FIGURES\125_FIGURE 3.DWG PLOT: 8/8/2017 4:25:28 PM BY KEVIN WILLIAMS

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Manhole Loading Calculations

ID	Additional ADWF @ MH (gpd)	Additional I/I @ MH (gpd)	Total ADWF @ MH (gpd)	Diurnal Peaking Factor	Total PWWF @ MH (gpd)	Total I/I @ MH (gpd)	Total PWWF @ MH (gpd)	Model MH Load (gpd)
BH-010	0	0	55,074	3.33	183,278	88,973	272,251	0
BH-020	0	0	55,074	3.33	183,278	88,973	272,251	0
BH-030	0	0	55,074	3.33	183,278	88,973	272,251	0
BH-040	698	4,398	55,074	3.33	183,278	88,973	272,251	6,670
BH-050	13,128	19,888	54,376	3.33	181,006	84,575	265,582	62,878
BH-060	2,915	3,774	41,249	3.35	138,017	64,687	202,704	13,382
BH-070	15,525	20,100	38,333	3.35	128,409	60,913	189,321	71,643
BH-080	22,808	40,813	22,808	3.37	76,866	40,813	117,678	117,678
BH-090	0	0	0	3.40	0	0	0	0
CTS-010	0	0	2,546,651	1.58	3,553,569	5,627,556	9,181,125	0
CTS-020	72,176	255,258	2,546,651	1.58	3,553,569	5,627,556	9,181,125	369,296
CTS-030	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-040	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-050	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-060	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-070	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-080	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-090	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-100	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-110	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-120	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-130	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-140	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-150	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-160	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-170	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-180	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-190	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-200	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-210	0	0	2,474,475	1.58	3,439,531	5,372,298	8,811,829	0
CTS-220	268,839	405,388	2,474,475	1.58	3,439,531	5,372,298	8,811,829	1,052,774
CTS-230	0	0	2,120,677	1.58	2,880,530	4,878,524	7,759,054	0
CTS-240	15,334	22,693	2,120,677	1.58	2,880,530	4,878,524	7,759,054	46,921
CTS-250	0	0	2,105,343	1.58	2,856,302	4,855,831	7,712,133	0
CTS-260	0	0	2,105,343	1.58	2,856,302	4,855,831	7,712,133	0
CTS-270	33,022	42,752	2,105,343	1.58	2,856,302	4,855,831	7,712,133	94,928
CTS-280	0	0	2,072,321	1.58	2,804,127	4,813,079	7,617,206	0
CTS-290	0	0	2,072,321	1.58	2,804,127	4,813,079	7,617,206	175,990
CTS-300	7,581	9,903	2,017,247	1.58	2,717,110	4,724,105	7,441,215	21,882
CTS-310	0	0	2,009,666	1.58	2,705,132	4,714,202	7,419,334	0
CTS-320	9,080	11,861	2,009,666	1.58	2,705,132	4,714,202	7,419,334	26,207
CTS-330	3,811	5,364	2,000,586	1.58	2,690,786	4,702,341	7,393,127	11,384
CTS-340	5,539	17,119	1,996,775	1.58	2,684,765	4,696,978	7,381,743	25,871
CTS-350	0	0	1,991,236	1.58	2,676,013	4,679,858	7,355,872	0
CTS-360	13	106	1,991,236	1.58	2,676,013	4,679,858	7,355,872	1,115,324
CTS-370	0	0	1,660,602	1.58	2,153,612	4,086,936	6,240,548	0
CTS-380	0	0	1,660,602	1.58	2,153,612	4,086,936	6,240,548	0
CTS-390	0	0	1,660,602	1.58	2,153,612	4,086,936	6,240,548	0
CTS-400	0	0	1,660,602	1.58	2,153,612	4,086,936	6,240,548	0
CTS-410	17,054	27,290	1,660,602	1.58	2,153,612	4,086,936	6,240,548	54,236
CTS-420	8,107	11,090	1,643,548	1.58	2,126,666	4,059,646	6,186,312	23,899
CTS-430	110,773	128,317	1,635,441	1.58	2,113,857	4,048,556	6,162,413	303,338
CTS-440	0	0	1,524,668	1.58	1,938,835	3,920,239	5,859,074	0
CTS-450	6,952	23,748	1,524,668	1.58	1,938,835	3,920,239	5,859,074	34,733

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Manhole Loading Calculations

ID	Additional ADWF @ MH (gpd)	Additional I/I @ MH (gpd)	Total ADWF @ MH (gpd)	Diurnal Peaking Factor	Total PWWF @ MH (gpd)	Total I/I @ MH (gpd)	Total PWWF @ MH (gpd)	Model MH Load (gpd)
CTS-451	0	0	1,517,715	1.58	1,927,850	3,896,491	5,824,341	0
CTS-452	0	0	1,517,715	1.58	1,927,850	3,896,491	5,824,341	0
CTS-453	7,580	11,388	1,517,715	1.58	1,927,850	3,896,491	5,824,341	23,364
CTS-460	247,797	363,619	1,510,136	1.58	1,915,874	3,885,103	5,800,977	4,366,322
CTS-470	0	0	247,406	3.08	760,995	673,660	1,434,655	0
CTS-480	0	0	247,406	3.08	760,995	673,660	1,434,655	0
CTS-490	0	0	247,406	3.08	760,995	673,660	1,434,655	0
CTS-500	162	210	247,406	3.08	760,995	673,660	1,434,655	657
CTS-510	4,108	7,710	247,244	3.08	760,548	673,449	1,433,998	19,037
CTS-520	1,805	2,337	243,136	3.08	749,221	665,739	1,414,960	7,328
CTS-530	2,116	2,740	241,331	3.08	744,230	663,402	1,407,632	8,602
CTS-540	12,489	16,804	239,215	3.09	738,367	660,663	1,399,030	51,643
CTS-550	4,838	6,264	226,726	3.10	703,528	643,859	1,347,387	19,870
CTS-560	12,121	35,406	221,888	3.11	689,921	637,595	1,327,516	69,762
CTS-570	5,442	7,045	209,767	3.13	655,564	602,190	1,257,754	22,594
CTS-580	26,546	41,483	204,325	3.13	640,015	595,145	1,235,160	118,451
CTS-590	427	677	177,779	3.17	563,047	553,662	1,116,709	1,930
CTS-600	1,134	1,468	177,353	3.17	561,795	552,984	1,114,779	4,797
CTS-610	18,010	27,690	176,219	3.17	558,465	551,517	1,109,982	81,033
CTS-620	2,066	2,674	158,209	3.19	505,123	523,827	1,028,949	8,846
CTS-630	44,436	65,087	156,144	3.20	498,950	521,153	1,020,103	200,577
CTS-640	0	0	111,708	3.25	363,461	456,065	819,526	0
CTS-650	48,084	64,927	111,708	3.25	363,461	456,065	819,526	217,368
CTS-660	1,784	2,310	63,624	3.32	211,020	391,138	602,158	8,082
CTS-670	3,756	14,737	61,841	3.32	205,248	388,829	594,077	26,916
CTS-680	4,378	16,008	58,085	3.32	193,068	374,092	567,160	30,253
CTS-690	775	4,568	53,707	3.33	178,824	358,084	536,908	7,095
CTS-700	1,808	10,704	52,932	3.33	176,297	353,516	529,813	16,603
CTS-710	1,640	9,567	51,124	3.33	170,397	342,812	513,209	14,926
CTS-720	1,982	7,009	49,484	3.34	165,039	333,245	498,284	13,496
CTS-730	16,305	111,614	47,502	3.34	158,552	326,236	484,787	165,370
CTS-740	439	3,535	31,197	3.36	104,795	214,622	319,417	4,991
CTS-750	11,904	84,068	30,758	3.36	103,339	211,087	314,426	123,768
CTS-760	2,619	10,623	18,854	3.38	63,639	127,019	190,658	19,409
CTS-770	0	0	16,235	3.38	54,853	116,396	171,250	0
CTS-780	0	0	16,235	3.38	54,853	116,396	171,250	0
CTS-790	0	0	16,235	3.38	54,853	116,396	171,250	0
CTS-800	10,890	73,344	16,235	3.38	54,853	116,396	171,250	110,063
CTS-810	0	0	5,344	3.39	18,134	43,053	61,186	0
CTS-820	5,344	43,053	5,344	3.39	18,134	43,053	61,186	61,186
CTS-830	0	0	0	3.40	0	0	0	0
F-010	0	0	330,621	2.97	980,914	592,816	1,573,731	0
F-020	1,562	8,713	330,621	2.97	980,914	592,816	1,573,731	12,674
F-030	5,580	8,866	329,058	2.97	976,953	584,104	1,561,056	23,069
F-040	0	0	323,478	2.98	962,749	575,237	1,537,987	0
F-050	1,410	1,825	323,478	2.98	962,749	575,237	1,537,987	5,427
F-060	232,069	328,155	322,068	2.98	959,148	573,412	1,532,560	991,919
F-070	2,706	3,503	89,999	3.28	295,385	245,257	540,642	12,074
F-080	973	3,648	87,293	3.29	286,814	241,754	528,568	6,736
F-090	3,300	18,402	86,320	3.29	283,726	238,106	521,832	28,889
F-100	0	0	83,020	3.29	273,239	219,704	492,943	0
F-110	0	0	83,020	3.29	273,239	219,704	492,943	0
F-120	0	0	83,020	3.29	273,239	219,704	492,943	0
F-130	0	0	83,020	3.29	273,239	219,704	492,943	0

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Manhole Loading Calculations

ID	Additional ADWF @ MH (gpd)	Additional I/I @ MH (gpd)	Total ADWF @ MH (gpd)	Diurnal Peaking Factor	Total PWWF @ MH (gpd)	Total I/I @ MH (gpd)	Total PWWF @ MH (gpd)	Model MH Load (gpd)
F-140	0	0	83,020	3.29	273,239	219,704	492,943	0
F-150	0	0	83,020	3.29	273,239	219,704	492,943	0
F-160	0	0	83,020	3.29	273,239	219,704	492,943	0
F-170	14,154	78,936	83,020	3.29	273,239	219,704	492,943	124,243
F-180	68,866	140,768	68,866	3.31	227,931	140,768	368,700	368,700
LP-010	0	0	84,958	3.29	279,403	88,387	367,790	0
LP-020	0	0	84,958	3.29	279,403	88,387	367,790	0
LP-030	0	0	84,958	3.29	279,403	88,387	367,790	0
LP-040	13,115	13,677	84,958	3.29	279,403	88,387	367,790	55,574
LP-050	0	0	71,843	3.31	237,506	74,710	312,216	0
LP-060	0	0	71,843	3.31	237,506	74,710	312,216	0
LP-070	0	0	71,843	3.31	237,506	74,710	312,216	0
LP-080	1,130	3,996	71,843	3.31	237,506	74,710	312,216	7,626
LP-090	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-100	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-110	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-120	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-130	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-140	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-150	0	0	70,714	3.31	233,876	70,714	304,589	0
LP-160	54,461	70,714	70,714	3.31	233,876	70,714	304,589	304,589
SP-010	4,031	14,988	492,065	2.76	1,355,833	1,302,841	2,658,674	23,519
SP-020	0	0	488,034	2.76	1,347,303	1,287,853	2,635,156	0
SP-030	124,749	225,240	488,034	2.76	1,347,303	1,287,853	2,635,156	510,264
SP-040	0	0	363,285	2.92	1,062,279	1,062,612	2,124,892	0
SP-050	0	0	363,285	2.92	1,062,279	1,062,612	2,124,892	0
SP-060	0	0	363,285	2.92	1,062,279	1,062,612	2,124,892	0
SP-070	8,805	13,423	363,285	2.92	1,062,279	1,062,612	2,124,892	35,081
SP-080	0	0	354,479	2.94	1,040,621	1,049,190	2,089,811	0
SP-090	0	0	354,479	2.94	1,040,621	1,049,190	2,089,811	0
SP-100	91,804	143,909	354,479	2.94	1,040,621	1,049,190	2,089,811	381,822
SP-110	0	0	262,675	3.06	802,708	905,281	1,707,989	0
SP-120	0	0	262,675	3.06	802,708	905,281	1,707,989	0
SP-130	0	0	262,675	3.06	802,708	905,281	1,707,989	0
SP-140	0	0	262,675	3.06	802,708	905,281	1,707,989	0
SP-150	4,709	17,819	262,675	3.06	802,708	905,281	1,707,989	30,617
SP-160	0	0	257,966	3.06	789,910	887,462	1,677,372	0
SP-170	0	0	257,966	3.06	789,910	887,462	1,677,372	0
SP-180	0	0	257,966	3.06	789,910	887,462	1,677,372	0
SP-190	3,140	11,347	257,966	3.06	789,910	887,462	1,677,372	19,914
SP-200	0	0	254,826	3.07	781,343	876,114	1,657,458	0
SP-210	579	2,349	254,826	3.07	781,343	876,114	1,657,458	3,932
SP-210-a	0	0	254,247	3.07	779,760	873,765	1,653,525	0
SP-210-b	0	0	254,247	3.07	779,760	873,765	1,653,525	0
SP-210-c	24,768	100,447	254,247	3.07	779,760	873,765	1,653,525	168,963
SP-220	0	0	229,479	3.10	711,244	773,318	1,484,562	0
SP-230	195,536	677,861	229,479	3.10	711,244	773,318	1,484,562	1,275,206
SP-240	0	0	33,944	3.36	113,899	95,457	209,356	0
SP-241	33,944	95,457	33,944	3.36	113,899	95,457	209,356	209,356
SP-250	0	0	0	3.40	0	0	0	0
W-010	17,123	60,555	1,014,932	2.20	2,324,692	2,847,824	5,172,516	78,122
W-020	0	0	997,810	2.22	2,307,125	2,787,269	5,094,394	0
W-030	0	0	997,810	2.22	2,307,125	2,787,269	5,094,394	0
W-040	0	0	997,810	2.22	2,307,125	2,787,269	5,094,394	0

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Manhole Loading Calculations

ID	Additional ADWF @ MH (gpd)	Additional I/I @ MH (gpd)	Total ADWF @ MH (gpd)	Diurnal Peaking Factor	Total PWWF @ MH (gpd)	Total I/I @ MH (gpd)	Total PWWF @ MH (gpd)	Model MH Load (gpd)
W-050	5,468	4,485	997,810	2.22	2,307,125	2,787,269	5,094,394	10,257
W-060	0	0	992,342	2.23	2,301,353	2,782,784	5,084,137	0
W-070	6,027	4,943	992,342	2.23	2,301,353	2,782,784	5,084,137	11,395
W-080	0	0	986,315	2.24	2,294,900	2,777,841	5,072,741	0
W-090	0	0	986,315	2.24	2,294,900	2,777,841	5,072,741	0
W-100	0	0	986,315	2.24	2,294,900	2,777,841	5,072,741	0
W-110	0	0	986,315	2.24	2,294,900	2,777,841	5,072,741	2,150,725
W-120	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-130	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-140	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-150	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-160	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-170	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-180	0	0	494,250	2.88	1,447,016	1,475,000	2,922,016	0
W-190	494,250	1,475,000	494,250	2.88	1,447,016	1,475,000	2,922,016	2,922,016

2,036,148	City ADWF MH Load total
86,788	NPTS and SPTS flows from developed land (not included in this scenario)
2,122,937	Total City ADWF
100,250	Diablo Grande ADWF, assumed for Year 2028
394,000	Plus CLIBP Phase 1 flow
2,617,187	TOTAL ADWF

Other Assumptions

3.1	Diablo Grande separate Diurnal Peaking Factor (constant)
310,775	Diablo Grande Peak Dry Weather Flow (assumed constant throughout the system)
1,398,000	Diablo Grande I/I flow assumed
77,000	Plus CLIBP Phase 1 I/I flow

For sewers with flow from Diablo Grande (W trunk sewers and sewers downstream of CTS-460):
Diurnal Peaking Factor (DPF) = 3.4 - 1.31*(Total ADWF [mgd] - Diablo Grande ADWF [mgd]), with a minimum value of 1.58
Total PDWF = (Total ADWF- Diablo Grande Buildout ADWF)*DPF + Diablo Grande Buildout ADWF*Diablo Grande separate Diurnal Peaking Factor
Total PWWF = Total PDWF + Total I/I
Model MH Load = Total PWWF @ MH - Total PWWF @ upstream manhole

For sewers with no flow from Diablo Grande:
Diurnal Peaking Factor (DPF) = 3.4 - 1.31*Total ADWF [mgd], with a minimum value of 1.58
Total PDWF = Total ADWF*DPF
Total PWWF = Total PDWF + Total I/I
Model MH Load = Total PWWF @ MH - Total PWWF @ upstream manhole

Appendix A
Scenario 2: Buildout
Manhole Loading Calculations
South Patterson Trunk Sewer

ID	Additional ADWF @ MH (gpd)	Additional I/I @ MH (gpd)	Total ADWF @ MH (gpd)	Diurnal Peaking Factor	Total PDWF @ MH (gpd)	Total I/I @ MH (gpd)	Total PWWF @ MH (gpd)	Model MH Load (gpd)
STS-030	101,862	116,873	2,464,060	1.58	5,033,214	2,788,936	7,822,150	277,814
STS-040	54,010	56,324	2,362,198	1.58	4,872,273	2,672,063	7,544,336	141,660
STS-050	115,529	182,544	2,308,188	1.58	4,786,937	2,615,739	7,402,676	365,080
STS-060	19,195	56,070	2,192,659	1.58	4,604,402	2,433,195	7,037,597	86,398
STS-080	136,858	233,103	2,173,465	1.58	4,574,074	2,377,125	6,951,199	276,232
STS-090	35,242	43,440	2,036,607	1.71	4,530,945	2,144,021	6,674,967	46,092
STS-100	105,148	148,250	2,001,365	1.76	4,528,293	2,100,582	6,628,875	175,501
STS-110	92,471	143,225	1,896,217	1.90	4,501,042	1,952,332	6,453,374	191,130
STS-120	1,803,746	1,809,106	1,803,746	2.02	4,453,138	1,809,106	6,262,244	6,262,244

Assumptions

750,000	Diablo Grande Buildout ADWF
891,000	CLIBP Buildout flow
3.1	Diablo Grande separate Diurnal Peaking Factor (constant)
2,325,000	Diablo Grande Peak Dry Weather Flow (assumed constant throughout the system)
1,398,000	Diablo Grande I/I flow assumed
126,000	CLIBP Buildout I/I flow

Diurnal Peaking Factor (DPF) = 3.4 - 1.31*(Total ADWF [mgd] - Diablo Grande ADWF [mgd]), with a minimum value of 1.58
Total PDWF = (Total ADWF- Diablo Grande Buildout ADWF)*DPF + Diablo Grande Buildout ADWF*Diablo Grande separate Diurnal Peaking Factor
Total PWWF = Total PDWF + Total I/I
Model MH Load = Total PWWF @ MH - Total PWWF @ upstream manhole

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Ward Avenue Trunk Sewer
Manhole Results

ID	Rim Elevation (ft)	Total Flow (gpd)	Grade (ft)	Status	Hydraulic Jump	Surcharge Depth (ft)	Unfilled Depth (ft)
W-010	103	78,121.59	93.84	Not Full	No	0.14	9.16
W-020	104.6	0	94.88	Not Full	No	0.38	9.72
W-030	106.9	0	95.92	Not Full	No	0.71	10.98
W-040	106.9	0	95.96	Not Full	No	0.59	10.94
W-050	108.8	10,256.95	96.75	Not Full	No	-0.58	12.05
W-060	110.7	0	98.68	Not Full	No	-0.61	12.02
W-070	112.6	11,394.94	100.49	Not Full	No	-0.56	12.11
W-080	113.9	0	102.32	Not Full	No	-0.59	11.58
W-090	115.7	0	104.18	Not Full	No	-0.59	11.52
W-100	117.8	0	106.04	Not Full	No	-0.59	11.76
W-110	119.6	2,150,713.82	106.92	Not Full	Yes	-0.50	12.68
W-120	119.05	0	108.29	Not Full	No	-0.93	10.76
W-130	119.8	0	112.18	Not Full	No	-0.83	7.62
W-140	122.6	0	117.12	Not Full	No	-0.81	5.48
W-150	125.59	0	120.24	Not Full	No	-0.69	5.35
W-160	128.6	0	123.20	Not Full	No	-0.69	5.40
W-170	131.99	0	124.67	Not Full	No	-0.32	7.32
W-180	135.66	0	125.77	Not Full	Yes	-0.32	9.89
W-190	139.02	2,922,000.81	133.56	Not Full	No	-0.79	5.46

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Ward Avenue Trunk Sewer
Pipe Results

ID	Diameter (in)	Length (ft)	Slope	Total Flow (gpd)	Flow Type	Velocity (ft/s)	d/D	q/Q	Water Depth (ft)	Critical Depth (ft)	Froude Number	Full Flow (gpd)	Coverage Count	Backwater Adjustment	Adjusted Depth (ft)	Adjusted Velocity (ft/s)
W-010:CTS-460	21	421	0.002	5,172,488.11	Pressurized	3.33	1.00	1.07	1.75	1.02	0.44	4,851,952.10	0	No	1.75	3.33
W-020:W-010	21	421	0.002	5,094,366.52	Pressurized	3.28	1.00	1.14	1.75	0.97	0.44	4,476,077.23	0	Yes	1.75	3.28
W-030:W-020	21	421	0.002	5,094,366.52	Pressurized	3.28	1.00	1.21	1.75	0.94	0.44	4,216,787.86	0	Yes	1.75	3.28
W-040:W-030	21	14	0.004	5,094,366.52	Pressurized	4.76	0.65	0.76	1.14	1.04	0.84	6,722,104.09	0	Yes	1.75	3.28
W-050:W-040	21	465	0.004	5,094,366.52	Free Surface	4.63	0.67	0.78	1.17	1.04	0.80	6,494,169.53	0	Yes	1.70	3.30
W-060:W-050	21	465	0.004	5,084,109.57	Free Surface	4.72	0.65	0.76	1.14	1.04	0.83	6,666,458.58	0	Yes	1.16	4.67
W-070:W-060	21	465	0.004	5,084,109.57	Free Surface	4.52	0.68	0.81	1.19	1.04	0.77	6,317,183.37	0	No	1.19	4.52
W-080:W-070	21	465	0.004	5,072,714.63	Free Surface	4.62	0.67	0.78	1.16	1.04	0.80	6,494,169.53	0	Yes	1.18	4.56
W-090:W-080	21	465	0.004	5,072,714.63	Free Surface	4.62	0.67	0.78	1.16	1.04	0.80	6,494,169.53	0	No	1.16	4.62
W-100:W-090	21	465	0.004	5,072,714.63	Free Surface	4.62	0.67	0.78	1.16	1.04	0.80	6,494,169.53	0	No	1.16	4.62
W-110:W-100	21	172	0.003	5,072,714.63	Free Surface	4.28	0.71	0.86	1.25	1.04	0.70	5,911,079.91	0	No	1.25	4.28
W-120:W-110	18	95	0.02	2,922,000.81	Free Surface	7.38	0.38	0.30	0.57	0.82	2.00	9,601,425.61	0	Yes	0.83	4.52
W-130:W-120	18	85	0.011	2,922,000.81	Free Surface	5.93	0.45	0.41	0.67	0.82	1.46	7,120,305.60	0	No	0.67	5.93
W-140:W-130	18	500	0.01	2,922,000.81	Free Surface	5.66	0.46	0.44	0.69	0.82	1.36	6,683,518.26	0	No	0.69	5.66
W-150:W-140	18	500	0.006	2,922,000.81	Free Surface	4.68	0.54	0.56	0.81	0.82	1.03	5,184,186.52	0	No	0.81	4.68
W-160:W-150	18	500	0.006	2,922,000.81	Free Surface	4.65	0.54	0.57	0.81	0.82	1.02	5,148,309.37	0	No	0.81	4.65
W-170:W-160	18	500	0.002	2,922,000.81	Free Surface	3.04	0.79	0.96	1.18	0.82	0.49	3,044,259.15	0	No	1.18	3.04
W-180:W-170	18	500	0.002	2,922,000.81	Free Surface	3.04	0.79	0.96	1.18	0.82	0.49	3,044,259.15	0	No	1.18	3.04
W-190:W-180	18	500	0.009	2,922,000.81	Free Surface	5.46	0.48	0.46	0.71	0.82	1.29	6,371,162.40	0	No	0.71	5.46

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Manhole Results

ID	Rim Elevation (ft)	Total Flow (gpd)	Grade (ft)	Status	Hydraulic Jump	Surcharge Depth (ft)	Unfilled Depth (ft)
CTS-010	55	0	46.26	Not Full	No	0.01	8.74
CTS-020	55	369,294.08	46.29	Not Full	No	0.04	8.71
CTS-030	55	0	46.45	Not Full	No	-0.11	8.56
CTS-040	54.5	0	46.55	Not Full	No	-0.20	7.95
CTS-050	55	0	46.81	Not Full	No	-0.45	8.19
CTS-060	56	0	47.05	Not Full	Yes	-0.68	8.96
CTS-070	56	0	51.92	Not Full	No	-0.98	4.08
CTS-080	56.56	0	53.39	Not Full	No	-1.51	3.17
CTS-090	57.97	0	54.60	Not Full	No	-1.21	3.38
CTS-100	59.36	0	55.48	Not Full	No	-1.21	3.88
CTS-110	60.81	0	56.42	Not Full	No	-1.21	4.39
CTS-120	62.15	0	57.29	Not Full	No	-1.21	4.86
CTS-130	63.59	0	58.22	Not Full	No	-1.21	5.38
CTS-140	65.02	0	59.13	Not Full	No	-1.21	5.89
CTS-150	66.41	0	60.03	Not Full	No	-1.21	6.38
CTS-160	67.8	0	60.92	Not Full	No	-1.21	6.88
CTS-170	70	0	61.80	Not Full	No	-1.21	8.20
CTS-180	70.51	0	62.66	Not Full	No	-1.21	7.85
CTS-190	71.99	0	63.61	Not Full	No	-1.21	8.38
CTS-200	73.39	0	64.52	Not Full	No	-1.21	8.88
CTS-210	74.84	0	65.44	Not Full	No	-1.21	9.40
CTS-220	76	1,052,768.53	66.19	Not Full	No	-1.21	9.81
CTS-230	77.3	0	67.28	Not Full	No	-1.16	10.02
CTS-240	78.11	46,920.76	68.07	Not Full	No	-1.13	10.04
CTS-250	78.63	0	68.57	Not Full	No	-1.18	10.06
CTS-260	79.95	0	69.85	Not Full	No	-1.13	10.10
CTS-270	81.23	94,927.51	70.97	Not Full	No	-1.08	10.26
CTS-280	82.64	0	72.21	Not Full	No	-1.14	10.43
CTS-290	84	175,989.09	73.53	Not Full	Yes	-1.17	10.47
CTS-300	84	21,881.89	73.57	Not Full	No	-1.36	10.43
CTS-310	86	0	74.77	Not Full	No	-1.10	11.23
CTS-320	86	26,206.86	75.04	Not Full	No	-1.33	10.96
CTS-330	88	11,383.94	76.19	Not Full	Yes	-1.00	11.81
CTS-340	89	25,870.87	77.10	Not Full	No	-1.13	11.90
CTS-350	90	0	78.65	Not Full	Yes	-1.04	11.35
CTS-360	90	1,115,318.20	80.31	Not Full	No	-1.09	9.69
CTS-370	90	0	80.92	Not Full	No	-1.17	9.08
CTS-380	90	0	81.13	Not Full	No	-1.17	8.87

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Manhole Results

ID	Rim Elevation (ft)	Total Flow (gpd)	Grade (ft)	Status	Hydraulic Jump	Surcharge Depth (ft)	Unfilled Depth (ft)
CTS-390	91	0	82.19	Not Full	Yes	-1.17	8.81
CTS-400	91.5	0	82.79	Not Full	No	-1.37	8.71
CTS-410	92.5	54,235.72	84.11	Not Full	Yes	-1.16	8.39
CTS-420	94	23,898.88	86.26	Not Full	No	-1.25	7.74
CTS-430	96	303,336.42	88.15	Not Full	No	-1.18	7.85
CTS-440	97	0	88.92	Not Full	Yes	-1.12	8.08
CTS-450	99	34,732.82	90.96	Not Full	No	-1.24	8.04
CTS-451	99	0	91.60	Not Full	No	-0.63	7.41
CTS-452	99	0	92.23	Not Full	No	0.03	6.78
CTS-453	100.5	23,363.88	92.51	Not Full	No	0.03	7.99
CTS-460	102.3	4,366,299.30	92.74	Not Full	No	0.06	9.56
CTS-470	103.2	0	92.80	Not Full	No	-0.12	10.40
CTS-480	103.9	0	92.85	Not Full	No	-0.13	11.05
CTS-490	104.3	0	92.88	Not Full	No	-0.14	11.42
CTS-500	103.9	656.997	92.93	Not Full	No	-0.58	10.97
CTS-510	105	19,036.90	93.01	Not Full	No	-0.84	11.99
CTS-520	106.3	7,327.96	93.36	Not Full	No	-0.86	12.95
CTS-530	105.4	8,601.96	93.76	Not Full	No	-0.86	11.64
CTS-540	104.5	51,642.73	94.07	Not Full	No	-0.86	10.43
CTS-550	105.2	19,869.90	94.32	Not Full	No	-0.88	10.88
CTS-560	105.8	69,761.64	94.49	Not Full	No	-0.89	11.31
CTS-570	105.9	22,593.88	94.60	Not Full	No	-0.91	11.30
CTS-580	110	118,450.38	94.90	Not Full	No	-0.92	15.10
CTS-590	108.65	1,929.99	95.31	Not Full	No	-1.02	13.34
CTS-600	109.07	4,796.98	96.48	Not Full	No	-1.02	12.59
CTS-610	108.7	81,032.58	96.71	Not Full	No	-1.03	11.99
CTS-620	109.94	8,845.95	98.61	Not Full	No	-0.71	11.33
CTS-630	112.4	200,575.96	100.17	Not Full	No	-0.71	12.23
CTS-640	114.09	0	100.93	Not Full	No	-0.73	13.16
CTS-650	116.51	217,365.87	101.98	Not Full	Yes	-0.79	14.53
CTS-660	118.42	8,081.96	104.71	Not Full	No	-0.61	13.71
CTS-670	121.22	26,915.86	107.26	Not Full	No	-0.60	13.96
CTS-680	121.6	30,252.84	109.11	Not Full	No	-0.61	12.49
CTS-690	122.6	7,094.96	109.95	Not Full	No	-0.61	12.66
CTS-700	124.05	16,602.91	111.60	Not Full	Yes	-0.61	12.45
CTS-710	126.5	14,925.92	113.83	Not Full	No	-0.64	12.68
CTS-720	128.5	13,495.93	115.64	Not Full	No	-0.62	12.86
CTS-730	130.5	165,369.14	117.42	Not Full	No	-0.63	13.08

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Manhole Results

ID	Rim Elevation (ft)	Total Flow (gpd)	Grade (ft)	Status	Hydraulic Jump	Surcharge Depth (ft)	Unfilled Depth (ft)
CTS-740	132.9	4,990.97	119.60	Not Full	No	-0.70	13.30
CTS-750	135.4	123,767.36	121.85	Not Full	No	-0.70	13.55
CTS-760	139	19,408.90	124.03	Not Full	No	-0.77	14.97
CTS-770	142.7	0	126.27	Not Full	No	-0.78	16.43
CTS-780	145.1	0	127.61	Not Full	Yes	-0.79	17.49
CTS-790	147.8	0	133.41	Not Full	No	-0.83	14.40
CTS-800	148.7	110,062.43	134.18	Not Full	No	-0.81	14.53
CTS-810	153	0	137.69	Not Full	No	-0.88	15.31
CTS-820	155.8	61,185.68	141.34	Not Full	No	-0.88	14.46
CTS-830	160	0	144.87	Not Full	No	-1.00	15.13

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Pipe Results

ID	Diameter (in)	Length (ft)	Slope	Total Flow (gpd)	Flow Type	Velocity (ft/s)	d/D	q/Q	Water Depth (ft)	Critical Depth (ft)	Froude Number	Full Flow (gpd)	Backwater Adjustment	Adjusted Depth (ft)	Adjusted Velocity (ft/s)
CTS-020:CTS-010	33	38	0.001	9,181,073.27	Pressurized	3.54	0.64	0.74	1.76	1.23	0.51	12,432,136.22	Yes	2.75	2.39
CTS-030:CTS-020	33	230	0.001	8,811,779.19	Free Surface	3.50	0.62	0.71	1.72	1.21	0.51	12,377,965.43	Yes	2.72	2.30
CTS-040:CTS-030	33	154	0.001	8,811,779.19	Free Surface	3.50	0.62	0.71	1.72	1.21	0.51	12,351,144.24	Yes	2.60	2.35
CTS-050:CTS-040	33	392	0.001	8,811,779.19	Free Surface	3.50	0.62	0.71	1.72	1.21	0.51	12,362,167.13	Yes	2.42	2.46
CTS-060:CTS-050	33	354	0.001	8,811,779.19	Free Surface	3.50	0.62	0.71	1.72	1.21	0.51	12,354,632.77	Yes	2.19	2.69
CTS-070:CTS-060	18	25	0.257	8,811,779.19	Free Surface	25.27	0.35	0.26	0.52	1.37	7.24	34,522,489.34	Yes	1.30	8.40
CTS-080:CTS-070	33	200	0.004	8,811,779.19	Free Surface	5.23	0.45	0.42	1.24	1.21	0.94	20,987,861.52	No	1.24	5.23
CTS-090:CTS-080	33	500	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.55	1.21	0.62	14,540,817.00	No	1.55	3.97
CTS-100:CTS-090	33	494	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.54	1.21	0.62	14,547,356.61	Yes	1.55	3.97
CTS-110:CTS-100	33	517	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,614,070.95	Yes	1.54	3.98
CTS-120:CTS-110	33	478	0.002	8,811,779.19	Free Surface	3.99	0.56	0.60	1.54	1.21	0.63	14,621,712.29	Yes	1.54	3.98
CTS-130:CTS-120	33	511	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.55	1.21	0.62	14,542,397.78	No	1.55	3.97
CTS-140:CTS-130	33	507	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,599,651.54	Yes	1.54	3.98
CTS-150:CTS-140	33	496	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,599,331.59	No	1.54	3.98
CTS-160:CTS-150	33	494	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.54	1.21	0.62	14,547,356.61	No	1.54	3.97
CTS-170:CTS-160	33	488	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.54	1.21	0.62	14,554,053.98	Yes	1.54	3.97
CTS-180:CTS-170	33	477	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.54	1.21	0.62	14,552,667.02	No	1.54	3.97
CTS-190:CTS-180	33	525	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,579,234.02	Yes	1.54	3.97
CTS-200:CTS-190	33	500	0.002	8,811,779.19	Free Surface	3.97	0.56	0.61	1.55	1.21	0.62	14,540,817.00	No	1.55	3.97
CTS-210:CTS-200	33	513	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,592,689.71	Yes	1.54	3.97
CTS-220:CTS-210	33	414	0.002	8,811,779.19	Free Surface	3.98	0.56	0.60	1.54	1.21	0.63	14,587,572.16	No	1.54	3.98
CTS-230:CTS-220	30	481	0.003	7,759,010.66	Free Surface	4.47	0.54	0.56	1.34	1.16	0.76	13,765,531.98	Yes	1.44	4.09
CTS-240:CTS-230	30	304	0.003	7,759,010.66	Free Surface	4.35	0.55	0.58	1.37	1.16	0.73	13,290,480.64	No	1.37	4.35
CTS-250:CTS-240	30	195	0.003	7,712,089.91	Free Surface	4.55	0.53	0.55	1.32	1.16	0.78	14,116,749.94	Yes	1.35	4.43
CTS-260:CTS-250	30	493	0.002	7,712,089.91	Free Surface	4.34	0.55	0.58	1.37	1.16	0.73	13,276,994.60	No	1.37	4.34
CTS-270:CTS-260	30	480	0.002	7,712,089.91	Free Surface	4.16	0.57	0.62	1.42	1.16	0.68	12,549,948.77	No	1.42	4.16
CTS-280:CTS-270	30	527	0.002	7,617,162.40	Free Surface	4.31	0.55	0.58	1.36	1.15	0.73	13,201,918.62	Yes	1.39	4.21
CTS-290:CTS-280	30	510	0.003	7,617,162.40	Free Surface	4.43	0.53	0.56	1.33	1.15	0.76	13,675,791.75	Yes	1.35	4.37
CTS-300:CTS-290	30	42	0.005	7,441,173.32	Free Surface	5.77	0.43	0.38	1.07	1.14	1.13	19,670,253.44	Yes	1.24	4.76
CTS-310:CTS-300	30	442	0.002	7,419,291.43	Free Surface	4.05	0.56	0.61	1.40	1.14	0.67	12,258,108.89	No	1.40	4.05
CTS-320:CTS-310	30	127	0.004	7,419,291.43	Free Surface	5.10	0.47	0.45	1.17	1.14	0.95	16,678,378.46	Yes	1.29	4.51
CTS-330:CTS-320	30	475	0.002	7,393,084.57	Free Surface	3.73	0.60	0.67	1.50	1.13	0.59	11,044,112.05	No	1.50	3.73
CTS-340:CTS-330	27	233	0.006	7,381,700.63	Free Surface	5.79	0.50	0.49	1.12	1.17	1.09	14,933,653.74	Yes	1.31	4.77
CTS-350:CTS-340	27	349	0.004	7,355,829.76	Free Surface	5.21	0.54	0.57	1.21	1.17	0.93	12,981,141.89	No	1.21	5.21
CTS-360:CTS-350	27	351	0.005	7,355,829.76	Free Surface	5.52	0.52	0.53	1.16	1.17	1.02	14,008,565.97	Yes	1.19	5.36
CTS-370:CTS-360	27	154	0.004	6,240,511.56	Free Surface	5.13	0.48	0.47	1.08	1.07	0.99	13,434,248.20	Yes	1.12	4.90
CTS-380:CTS-370	27	47	0.004	6,240,511.56	Free Surface	5.13	0.48	0.47	1.08	1.07	0.99	13,415,593.83	No	1.08	5.13
CTS-390:CTS-380	27	235	0.005	6,240,511.56	Free Surface	5.15	0.48	0.46	1.08	1.07	0.99	13,479,326.22	Yes	1.08	5.14
CTS-400:CTS-390	27	64	0.009	6,240,511.56	Free Surface	6.73	0.39	0.32	0.88	1.07	1.47	19,432,774.93	No	0.88	6.73
CTS-410:CTS-400	27	233	0.004	6,240,511.56	Free Surface	5.07	0.48	0.47	1.09	1.07	0.97	13,213,927.18	No	1.09	5.07

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Pipe Results

ID	Diameter (in)	Length (ft)	Slope	Total Flow (gpd)	Flow Type	Velocity (ft/s)	d/D	q/Q	Water Depth (ft)	Critical Depth (ft)	Froude Number	Full Flow (gpd)	Backwater Adjustment	Adjusted Depth (ft)	Adjusted Velocity (ft/s)
CTS-420:CTS-410	27	396	0.006	6,186,275.84	Free Surface	5.58	0.45	0.41	1.00	1.07	1.12	15,094,738.68	Yes	1.05	5.29
CTS-430:CTS-420	27	404	0.005	6,162,376.96	Free Surface	5.13	0.48	0.46	1.07	1.06	0.99	13,470,824.99	No	1.07	5.13
CTS-440:CTS-430	27	211	0.003	5,859,040.54	Free Surface	4.54	0.50	0.50	1.13	1.04	0.85	11,642,255.59	No	1.13	4.54
CTS-450:CTS-440	27	431	0.005	5,859,040.54	Free Surface	5.26	0.45	0.41	1.01	1.04	1.06	14,208,146.39	Yes	1.07	4.87
CTS-451:CTS-450	27	23	0.001	5,155,703.30	Free Surface	2.60	0.72	0.87	1.63	0.97	0.37	5,918,344.79	No	1.63	2.60
CTS-452:CTS-451	27	7	-0.003	5,155,703.30	Pressurized	2.01	1.00		2.25	0.00	0.24		No	2.25	2.01
CTS-453:CTS-452	27	318	0.001	5,155,703.30	Pressurized	2.01	1.00	1.08	2.25	0.93	0.24	4,774,983.50	No	2.25	2.01
CTS-460:CTS-450	12	655	0.001	668,604.42	Pressurized	1.32	1.00	1.07	1.00	0.41	0.23	625,005.78	Yes	1.00	1.32
CTS-460:CTS-453	27	350	0.001	5,132,339.42	Pressurized	2.00	1.00	1.07	2.25	0.93	0.24	4,797,667.63	Yes	2.25	2.00
CTS-470:CTS-460	21	279	0.002	1,434,644.54	Free Surface	2.53	0.39	0.33	0.69	0.54	0.62	4,390,122.23	Yes	1.75	0.92
CTS-480:CTS-470	21	272	0	1,434,644.54	Free Surface	1.12	0.77	0.94	1.35	0.54	0.17	1,525,052.52	Yes	1.62	0.95
CTS-490:CTS-480	21	161	0	1,434,644.54	Free Surface	1.18	0.73	0.89	1.28	0.54	0.19	1,618,492.47	Yes	1.62	0.96
CTS-500:CTS-490	21	247	0.001	1,434,644.54	Free Surface	1.76	0.52	0.53	0.91	0.54	0.37	2,693,826.43	Yes	1.23	1.23
CTS-510:CTS-500	21	348	0.001	1,433,987.55	Free Surface	1.76	0.52	0.53	0.91	0.54	0.37	2,696,557.12	Yes	0.99	1.58
CTS-520:CTS-510	21	370	0.001	1,414,950.64	Free Surface	1.77	0.51	0.52	0.90	0.53	0.37	2,721,945.58	No	0.90	1.77
CTS-530:CTS-520	21	438	0.001	1,407,622.68	Free Surface	1.77	0.51	0.52	0.89	0.53	0.37	2,731,727.77	No	0.89	1.77
CTS-540:CTS-530	21	441	0.001	1,399,020.73	Free Surface	1.76	0.51	0.51	0.89	0.53	0.37	2,722,420.32	Yes	0.89	1.76
CTS-550:CTS-540	21	245	0.001	1,347,378.00	Free Surface	1.74	0.50	0.50	0.87	0.52	0.37	2,704,799.29	No	0.87	1.74
CTS-560:CTS-550	21	250	0.001	1,327,508.10	Free Surface	1.76	0.49	0.48	0.86	0.52	0.38	2,755,242.79	Yes	0.87	1.73
CTS-570:CTS-560	21	185	0.001	1,257,746.46	Free Surface	1.72	0.48	0.46	0.84	0.50	0.38	2,721,945.58	Yes	0.85	1.69
CTS-580:CTS-570	21	442	0.001	1,235,152.58	Free Surface	1.71	0.47	0.45	0.83	0.50	0.38	2,719,338.92	Yes	0.83	1.70
CTS-590:CTS-580	21	450	0.001	1,116,702.20	Free Surface	1.83	0.42	0.36	0.73	0.47	0.44	3,099,411.91	Yes	0.73	1.83
CTS-600:CTS-590	21	247	0.001	1,114,772.21	Free Surface	1.82	0.42	0.36	0.73	0.47	0.43	3,064,477.87	No	0.73	1.82
CTS-610:CTS-600	21	264	0.001	1,109,975.23	Free Surface	1.83	0.41	0.36	0.72	0.47	0.44	3,095,973.85	Yes	0.73	1.82
CTS-620:CTS-610	15	396	0.004	1,028,942.65	Free Surface	3.13	0.43	0.39	0.54	0.50	0.86	2,644,203.91	No	0.54	3.13
CTS-630:CTS-620	15	389	0.004	1,020,096.70	Free Surface	3.12	0.43	0.39	0.54	0.50	0.86	2,650,949.73	Yes	0.54	3.11
CTS-640:CTS-630	15	259	0.003	819,520.74	Free Surface	2.65	0.41	0.36	0.52	0.44	0.75	2,297,266.68	Yes	0.53	2.58
CTS-650:CTS-640	15	246	0.005	819,520.74	Free Surface	3.08	0.37	0.29	0.46	0.44	0.93	2,811,952.17	Yes	0.49	2.85
CTS-660:CTS-650	12	355	0.007	602,154.87	Free Surface	3.30	0.39	0.32	0.39	0.41	1.08	1,882,460.56	No	0.39	3.30
CTS-670:CTS-660	12	428	0.006	594,072.91	Free Surface	3.15	0.40	0.33	0.40	0.40	1.02	1,778,603.06	No	0.40	3.15
CTS-680:CTS-670	12	310	0.006	567,157.05	Free Surface	3.13	0.39	0.32	0.39	0.39	1.03	1,788,379.52	Yes	0.39	3.07
CTS-690:CTS-680	12	166	0.005	536,904.21	Free Surface	2.88	0.40	0.33	0.40	0.38	0.94	1,632,559.67	No	0.40	2.88
CTS-700:CTS-690	12	334	0.005	529,809.25	Free Surface	2.87	0.39	0.33	0.39	0.38	0.93	1,627,664.43	Yes	0.39	2.86
CTS-710:CTS-700	12	367	0.006	513,206.33	Free Surface	3.07	0.37	0.28	0.37	0.37	1.04	1,807,766.31	Yes	0.38	2.91
CTS-720:CTS-710	12	360	0.005	498,280.41	Free Surface	2.83	0.38	0.31	0.38	0.37	0.94	1,632,559.67	No	0.38	2.83
CTS-730:CTS-720	12	359	0.005	484,784.48	Free Surface	2.80	0.37	0.30	0.37	0.36	0.94	1,630,284.32	Yes	0.38	2.77
CTS-740:CTS-730	12	450	0.005	319,415.34	Free Surface	2.50	0.30	0.20	0.30	0.29	0.95	1,632,559.67	Yes	0.34	2.13
CTS-750:CTS-740	12	450	0.005	314,424.37	Free Surface	2.48	0.30	0.19	0.30	0.29	0.95	1,632,559.67	Yes	0.30	2.47
CTS-760:CTS-750	12	450	0.005	190,657.01	Free Surface	2.15	0.23	0.12	0.23	0.22	0.94	1,632,559.67	Yes	0.26	1.78
CTS-770:CTS-760	12	450	0.005	171,248.11	Free Surface	2.09	0.22	0.11	0.22	0.21	0.94	1,632,559.67	Yes	0.23	2.01

Appendix A
Scenario 1: CLIBP Phase 1 (Year 2018-2028)
Central Trunk Sewer
Pipe Results

ID	Diameter (in)	Length (ft)	Slope	Total Flow (gpd)	Flow Type	Velocity (ft/s)	d/D	q/Q	Water Depth (ft)	Critical Depth (ft)	Froude Number	Full Flow (gpd)	Backwater Adjustment	Adjusted Depth (ft)	Adjusted Velocity (ft/s)
CTS-780:CTS-770	12	244	0.006	171,248.11	Free Surface	2.16	0.21	0.10	0.21	0.21	0.99	1,717,339.00	Yes	0.22	2.12
CTS-790:CTS-780	12	354	0.012	171,248.11	Free Surface	2.87	0.18	0.07	0.18	0.21	1.45	2,565,211.33	No	0.18	2.87
CTS-800:CTS-790	12	95	0.008	171,248.11	Free Surface	2.45	0.20	0.08	0.20	0.21	1.17	2,051,412.00	No	0.20	2.45
CTS-810:CTS-800	12	449	0.008	61,185.68	Free Surface	1.81	0.12	0.03	0.12	0.13	1.12	2,064,467.81	Yes	0.16	1.20
CTS-820:CTS-810	12	456	0.008	61,185.68	Free Surface	1.81	0.12	0.03	0.12	0.13	1.12	2,065,608.79	Yes	0.12	1.81
CTS-830:CTS-820	12	456	0.008	0	Free Surface	0.00	0.00		0.00	0.00	0.00	2,065,608.79	Yes	0.06	0.00

Appendix A
Scenario 2: Buildout
South Patterson Trunk Sewer
Manhole Results

ID	Rim Elevation (ft)	Total Flow (gpd)	Grade (ft)	Status	Hydraulic Jump	Surcharge Depth (ft)	Unfilled Depth (ft)
STS-010	55	0	47.331	Not Full	No	-1.569	7.669
STS-020	67	0	58.938	Not Full	No	-1.562	8.062
STS-030	75	277,812.56	63.039	Not Full	No	-1.561	11.961
STS-040	76	141,659.26	67	Not Full	No	-1.6	9
STS-050	93	365,078.10	79.853	Not Full	No	-1.747	13.147
STS-060	96	86,397.55	83.245	Not Full	No	-1.555	12.755
STS-070	108	0	98.402	Not Full	No	-1.398	9.598
STS-080	109	276,230.56	99.677	Not Full	No	-1.123	9.323
STS-090	122	46,091.76	106.888	Not Full	No	-1.112	15.112
STS-100	127	175,500.09	111.9	Not Full	No	-1.1	15.1
STS-110	133	191,129.01	118.094	Not Full	No	-0.806	14.906
STS-120	136	6,262,211.45	125.198	Not Full	No	-0.802	10.802

Appendix A
Scenario 2: Buildout
South Patterson Trunk Sewer
Pipe Results

Pipe ID	Diameter (in)	Length (ft)	Slope	Total Flow (gpd)	Velocity (ft/s)	d/D	q/Q	Water Depth (ft)	Critical Depth (ft)	Froude Number	Full Flow (gpd)
STS-010:CTS-010	36	2,730.00	0.002	7,822,110.34	3.64	0.48	0.46	1.43	1.10	0.61	16,953,783.51
STS-020:STS-010	36	5,684.00	0.002	7,822,110.34	3.61	0.48	0.47	1.44	1.10	0.60	16,813,011.21
STS-030:STS-020	36	2,715.00	0.002	7,822,110.34	3.61	0.48	0.47	1.44	1.10	0.60	16,796,945.88
STS-040:STS-030	36	2,586.00	0.002	7,544,297.78	3.61	0.47	0.44	1.40	1.08	0.61	16,999,613.48
STS-050:STS-040	36	3,947.00	0.002	7,402,638.52	4.09	0.42	0.37	1.25	1.07	0.74	20,293,145.75
STS-060:STS-050	36	2,653.00	0.001	7,037,560.41	3.23	0.48	0.47	1.45	1.05	0.54	15,011,693.05
STS-070:STS-060	30	1,627.00	0.004	6,951,162.86	5.16	0.44	0.40	1.10	1.10	0.99	17,310,174.73
STS-080:STS-070	30	353	0.002	6,951,162.86	3.88	0.55	0.59	1.38	1.10	0.65	11,836,746.59
STS-090:STS-080	30	2,076.00	0.002	6,674,932.30	3.69	0.56	0.60	1.39	1.07	0.61	11,221,679.74
STS-100:STS-090	30	1,927.00	0.002	6,628,840.54	3.63	0.56	0.60	1.40	1.07	0.60	10,999,850.82
STS-110:STS-100	24	1,353.00	0.004	6,453,340.45	5.11	0.60	0.67	1.19	1.13	0.90	9,680,947.36
STS-120:STS-110	24	1,280.00	0.004	6,262,211.45	4.93	0.60	0.67	1.20	1.11	0.87	9,344,099.15

APPENDIX H

Crows Landing Corridor Study

Transportation Analysis - Draft Report

Crows Landing Corridor Study

County of Stanislaus, California

March 2, 2018

TJKM

Table of Contents

Tables

Figures

Appendices

Appendix A – Level of Service Methodology

Appendix B – Existing Turning Movement Counts, Average Daily Traffic

Appendix C – Existing Conditions Intersection Level of Service

Appendix D – Existing plus Planned Roadway improvements Level of Service

Appendix E – Existing plus Planned Roadway Improvements – Mitigations

Appendix F – Cumulative (Year 2040) Conditions Intersection Level of Service

Appendix G – Cumulative plus Planned Roadway improvements Level of Service

Appendix H - Cumulative plus Planned Roadway Improvements – Mitigations

Appendix I – Traffic Index Analysis

INTRODUCTION

This report presents the results of the transportation analysis prepared for the Crows Landing Corridor Study. The study corridor is located in the southern portion of the City of Modesto and Stanislaus County. The study limits of Crows Landing Road extend between Hatch Road in the north to Whitmore Avenue in the south. Within the study limits, Crows Landing Road is a four lane north-south roadway and development along the study corridor is primarily commercial. Automobile-related services are more common and other commercial uses along Crows Landing Road encompasses of grocery and convenience stores, restaurants and industrial businesses such as a delivery service, truck and heavy equipment rentals, and farm machinery sales.

TJKM conducted a traffic operations and engineering analysis of the improvements and compared the improvements with the existing and future with no project conditions. The evaluation looked at the feasibility of the street improvements within the context of sound engineering, local jurisdictional policy and practicality of next steps. Additionally, TJKM reviewed the operations at the Crows Landing Intersections of Butte Avenue and Winmoore Way and provided recommendations on signal timing as well as the potential removal of one of these signalized intersections. Also, due to the addition of median islands along the project corridor strategic access points or median breaks for left turning movements will be evaluated in order to minimize impact of new median on operations for all modes of transportation. Finally, pedestrian crossings opportunities were reviewed.

This study report establishes a plan for a safe, efficient, and vibrant multimodal transportation facility serving the southern portion of Modesto and unincorporated Stanislaus County. This report also includes the results of the existing and future conditions analyses, and outlines the technical methodologies and analysis parameters utilized to quantify existing and future transportation conditions using level of service (LOS). Existing conditions represented in this report reflect approximately year 2017 conditions. Future conditions represented in this memorandum approximate a year 2040 forecast horizon.

This study report documents the corridor study process, identifies existing deficiencies and corresponding improvements along the study corridor. The purpose of this study is to analyze transportation options for the corridor in order to assess potential future development impact and to identify transportation strategies.

Study Intersections and Scenarios

TJKM evaluated traffic conditions at 11 intersections along the study corridor during a.m. and p.m. peak hours for a typical weekday. The peak periods were observed between 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m. The study intersections and associated traffic controls are as follows:

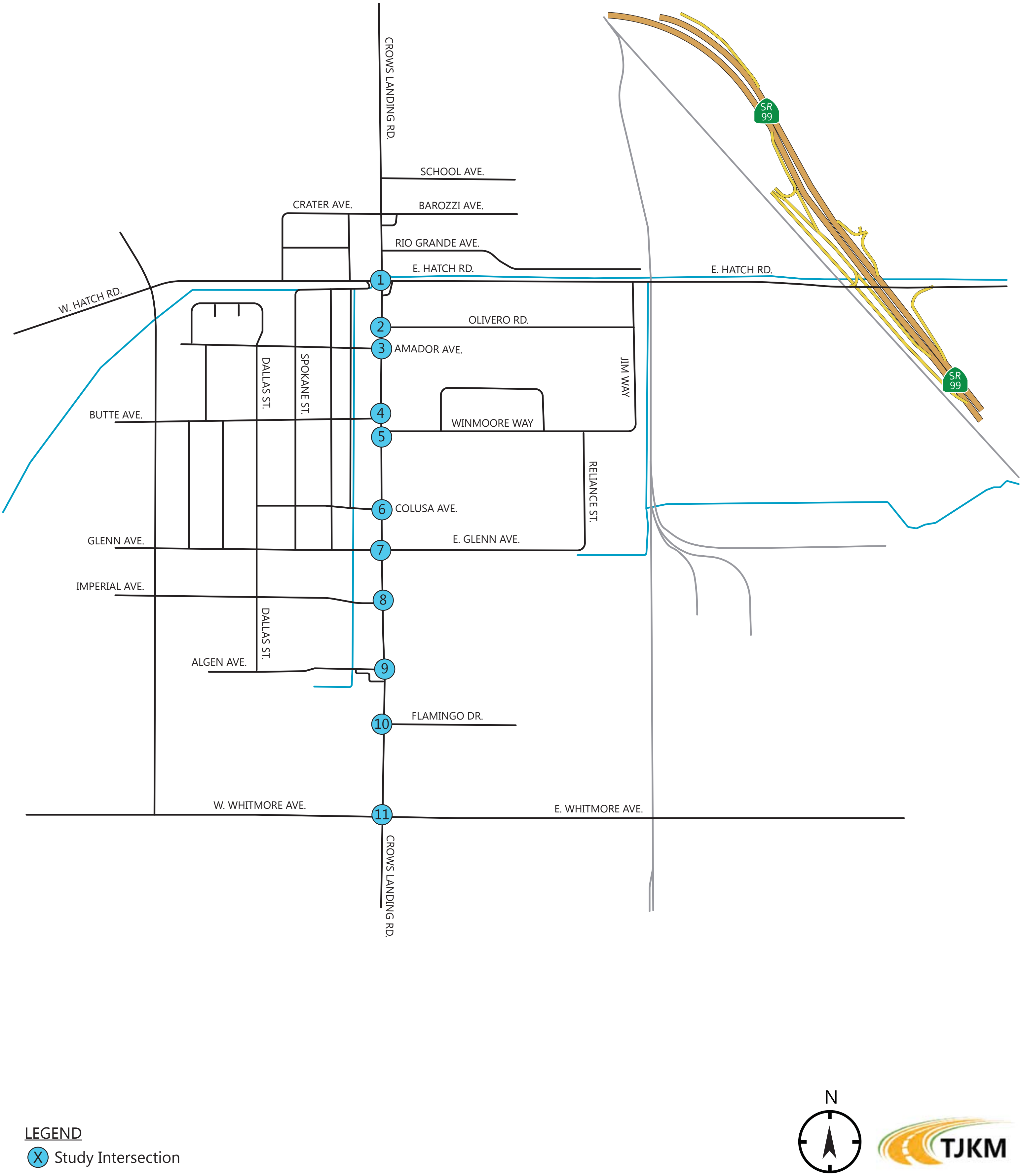
1. Crows Landing Road/Hatch Road (Signalized)
2. Crows Landing Road/Olivero Road (One-way Stop Control)
3. Crows Landing Road/Amador Avenue (One-way Stop Control)
4. Crows Landing Road/Butte Avenue (Signalized)
5. Crows Landing Road/Winmoore Way (Signalized)

6. Crows Landing Road/Colusa Avenue (One-way Stop Control)
7. Crows Landing Road/Glenn Avenue (Two-way Stop Control)
8. Crows Landing Road/Imperial Avenue (One-way Stop Control)
9. Crows Landing Road/Algen Avenue (One-way Stop Control)
10. Crows Landing Road/Flamingo Drive (One-way Stop Control)
11. Crows Landing Road/Whitmore Avenue (Signalized)

Figure 1 illustrates the study intersections and the vicinity map. This study addresses the following four traffic scenarios:

- **Existing Conditions** – This scenario evaluates the study intersections based on existing traffic volumes, lane geometries and traffic controls.
- **Existing plus Planned Roadway Improvements Conditions** – This scenario evaluates the study intersections with existing traffic volumes based on proposed roadway improvements. Rerouting of existing traffic volumes have been considered under this scenario based on the proposed roadway geometry changes.
- **Cumulative (Year 2040) Conditions** – This scenario is similar to Existing Conditions but with the projected rate of 1.15% per year for 23 years, which was applied to Existing Conditions Traffic Volumes.
- **Cumulative (Year 2040) plus Planned Roadway Improvements Conditions** – This is similar to Cumulative Conditions but with the of planned roadway improvements. Rerouting of cumulative traffic volumes have been considered under this scenario based on the proposed roadway geometry changes.

Vicinity Map



TJKM

STUDY METHODOLOGY

Level of Service Methodology

LOS is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets.

Signalized Intersections

The study intersections under traffic signal control were analyzed using the 2000 Highway Capacity Manual (HCM) Operations Methodology for signalized intersections described in Chapter 16 (HCM 2000). This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections was calculated using Synchro 9 analysis software and was correlated to a LOS designation as shown in **Appendix A**. The LOS methodology is described for signalized intersections in detail in **Appendix A**.

Unsignalized Intersections

The study intersections under stop control (Unsignalized) were analyzed using the 2000 HCM Operations Methodology for unsignalized intersections. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At the side street, all-way controlled intersections or two-way stop sign intersections, the control delay is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The weighted average delay for the entire intersections is presented for all-way stop controlled intersection. The average control delay for unsignalized intersections was calculated using Synchro 9 analysis software and was correlated to a LOS designation as shown in **Appendix A**. The LOS methodology is described for unsignalized intersections in detail in **Appendix A**.

As noted, the LOS is reported for the minor approach on unsignalized intersections. Depending on the availability of gaps, the minor approach might be operating at LOS D, E, or F while the overall intersection operates at LOS C or better. A minor approach that operates at LOS D, E, or F does not automatically translate into a need for a traffic signal. A signal warrant would still need to be met. There are many instances where only a few vehicles are experiencing LOS D, E, or F on the minor approach while the whole intersection operates at an acceptable LOS. A signal is usually not warranted under such conditions.

The justification for the installation of a traffic signal at an intersection is based on the warrants stated in the California Manual on Uniform Traffic Control Devices (MUTCD) published by Caltrans and the Federal Highway Administration (FHWA). The decision to install a signal should not be based solely upon the warrants, since the installation of traffic signals may increase certain types of collisions. Delay, congestion, approach conditions, driver confusion, future land use or other evidence of the need for right of way assignment beyond that which could be provided by stop signs must be demonstrated

Other improvement criteria considered include traffic conditions where a left-turn pocket might be required to safely accommodate projected volumes due to safety reason. For example, for safety reasons, due to higher speeds on major streets it is safer to provide left-turn pockets to channelize heavy left-turning traffic so that the flow of through traffic will not be impeded. This will also provide for safer and better traffic operations on the roadway. For this study, a left-turn pocket will be recommended when the projected left-turn volumes at a major intersection are more than 150 vehicles during the peak hour.

Significant Impact Criteria/Level of Service Standards

Stanislaus County Standards

For study intersections within Stanislaus County and not within the sphere of influence of the City of Modesto, the project's impact would be considered significant if the addition of project traffic cause any of the following to occur:

- Deterioration of an intersection or a roadway segment from LOS C or better to LOS D, LOS E or LOS F in rural areas;
- Deterioration of an intersection or a roadway segment from LOS D or better to LOS E or LOS F in urban areas

City of Modesto

For study intersections within the sphere of influence of the City of Modesto, the Project's impact would be considered significant if the addition of Project traffic cause any of the following to occur:

- Deterioration of a signalized intersection from LOS D or better to LOS E or LOS F;
- An increase in the service volume of any approach by five percent or more for a signalized intersection operating at LOS E or LOS F under baseline conditions;
- An increase in average delay of five or more seconds for a signalized intersection operation at LOS E or LOS F under baseline conditions;
- Deterioration of a controlled movement at an unsignalized intersection to LOS F and the volumes meeting at least one traffic signal warrant;
- An increase in the maximum queue by more than 2 vehicles (50 feet) when the available storage capacity is exceeded.
- Deterioration of a roadway segment from LOS D or better to LOS E or F, or worsening of LOS E or F conditions.

TRANSPORTATION SETTING

This chapter documents the existing transportation network, traffic volumes, and traffic operation analysis undertaken to assess existing conditions of the study corridor and to forecast future mobility issues. The purpose of these analyses is to provide a better understanding of current accessibility, mobility, and safety conditions in the Crows Landing Road study corridor.

Existing Transportation Network

Figure 1 shows the existing local street circulation in the project area and the study intersections. Important roadways in the project vicinity are described below:

Crows Landing Road

Crows Landing Road is a four-lane, north-south arterial connecting the City of Modesto in the north to areas in the southern part of Stanislaus County. It is classified by the County as a major roadway north of Service Road and as a Class C Expressway south of Service Road and by the City as an arterial. Crows Landing Road provides access to SR 99 from the study area. The segment of Crows Landing Road extending north from the Service Road through the Modesto area is designated on the Modesto Urban Area General Plan as a four-lane arterial. The posted speed limit in 35 miles per hour (mph).

Hatch Road

Hatch Road extends westward from Geer Road to just west of Carpenter Road. West of SR 99, it currently has two to four travel lanes. The Modesto Urban Area General Plan designates Hatch Road as a four-lane, Class C expressway. The posted speed limit is 45 mph.

Butte Avenue

Butte Avenue is a two-lane, east-west undivided roadway in the City of Modesto extending between Crows Landing Road in the east to its terminus Las Vegas Street in the west. The posted speed limit is 25 mph.

Winmoore Way

Winmoore Way is a two-lane, east-west undivided roadway in the City of Modesto extending between Jim Way in the east to Crows Landing Road in the west. The posted speed limit is 25 mph.

Whitmore Avenue

Whitmore Avenue is a two-lane east-west arterial that runs from unincorporated Stanislaus County east to Montpellier Road through downtown Ceres. It is classified as an arterial in the General Plan from the eastern edge of the Urban Growth Area to Carpenter Road and as a Major roadway by the County and provides access to SR 99. Through the Specific Plan area, Whitmore Avenue is designated as a four-lane arterial street on the Modesto Urban Area General Plan. Residential developments can be found along Whitmore Avenue and at its intersection with Crows Landing Road a mix of retail and service commercial land uses are located. The posted speed limit is 40 mph.

Existing Pedestrian Facilities

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities and services.

Pedestrian facilities consist of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

In the project study area, most of the study intersections are signalized and equipped with countdown pedestrian signal heads and cross walks. There is an existing pedestrian crossing with a pedestrian-activated rectangular rapid flashing beacons (RRFB) located at the intersection of Crows Landing Road/Amador Avenue. There are continuous sidewalks present on Crows Landing Road along the both sides within the project study area. All the existing sidewalks are approximately 6 to 12 feet wide varying along the project area.

Existing Bicycle Facilities

Bicycle facilities include the following:

- Bike Paths (Class I) – Paved trails that are separated from roadways
- Bike Lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs
- Bike Routes (Class III) – Designated roadways for bicycle use by signs or other markings which may or may not include additional pavement width for cyclists

Currently, no bike facilities are present along Crows Landing Road in the study area.

Existing Transit Facilities

Modesto Area Express (MAX)

Modesto Area Express operates bus route 42 that serve Crows Landing Road. Route 42 provides service between the Downtown Transportation Center and Community Service Agency/County Safety Center south of Whitmore Avenue at Hackett Road, and service east and west of Crows Landing Road. Route 42 provides 30-minute service from between 6:00 a.m. and 8:00 p.m. Monday through Saturday and hourly service on Sunday between about 8:30 a.m. and 6:30 p.m.

Stanislaus Regional Transit (StaRT)

Stanislaus Regional Transit operates Route 40 which is a fixed-route bus service that runs between the cities of Modesto and Patterson. In the Project vicinity, it runs along Crows Landing Road. It operates on weekdays between 5:25 am and 8:22 pm and four round trips on Saturday between 6:40 am and 7:22 pm.

Existing Traffic Volumes

The existing operations of the study intersections were evaluated for the highest one-hour volumes during weekday morning and evening peak periods. Turning movement counts for vehicles, bicycles, and pedestrians at all the study intersections were conducted during typical weekday day a.m. and p.m. peak periods (7:00-9:00a.m. and 4:00-6:00 p.m., respectively) in November 2017.

TJKM also collected 24-hour bidirectional traffic volumes for a one-day during the month of November along the following five roadway locations:

1. Crows Landing Road north of Olivero Road
2. Crows Landing Road north of Colusa Avenue
3. Crows Landing Road north of Imperial Avenue
4. Crows Landing Road north of Algen Avenue
5. Crows Landing Road north of Whitmore Avenue

Field verification of existing intersection lane configurations and traffic controls was also conducted and provided the basis for the LOS analysis for existing conditions. **Appendix B** includes all the data sheets for the collected vehicular Traffic, bicycle, and pedestrian counts. **Figure 2** illustrates the existing conditions lane geometry and traffic control at the study intersections.

Intersection Level of Service Analysis – Existing Conditions

The existing operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning and evening peak periods. TJKM collected existing intersection turning movement volumes at the study intersections during the weekday a.m. peak period (7:00-9:00 a.m.), and weekday p.m. peak period (4:00-6:00 p.m.) in November 2017.

For the intersection analysis, the Peak Hour Factors (PHF) based on the collected counts were used. The calculation of the PHF is described below.

Peak Hour Factor Calculation

The PHF is the hourly volume during the maximum-volume hour of the day divided by the peak 15-minute flow rate within the peak hour, a measure of traffic demand fluctuations within the peak hour. PHF values were calculated for the a.m., p.m., and weekend peak for all the approaches at each study intersection using the following formula:

$$PHF = \frac{V}{[4 \times V15]}$$

Where,

V = peak hour volume (vph)

V15 = volume during the peak 15 minutes of flow (vehicles/15 minutes)

The results of the Existing Conditions LOS Analysis using Synchro Software for the Existing Conditions are shown in **Table 1**. HCM 2000 Methodology was followed to analyze the study intersections. Currently all intersections operate at acceptable LOS C or better under existing conditions except for the intersections of Crows Landing Road/Hatch Road at LOS D during both the a.m. and the p.m. peak hours and the intersection of Crows Landing Road/Whitmore Avenue at LOS D during p.m. peak hour. Detailed calculations are contained in **Appendix C**.

Table 1: Intersection Level of Service - Existing Conditions

ID	Intersection	Intersection Control	A.M Peak Hour		P.M. Peak Hour	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Crows Landing Road/Hatch Road	Signalized	**38.3**	**D**	**41.0**	**D**
2	Crows landing Road/Olivero Road	One-way Stop Control	17.3	C	12.3	B
3	Crows Landing Road/Amador Avenue	One-way Stop Control	13.0	B	20.8	C
4	Crows Landing Road/Butte Avenue	Signalized	11.2	B	10.1	B
5	Crows Landing Road/Winmoore Way	Signalized	10.0	B	11.4	B
6	Crows Landing Road/Colusa Avenue	One-way Stop Control	12.2	B	14.0	B
7	Crows Landing Road/Glenn Avenue	Two-way Stop Control	16.8	C	19.8	C
8	Crows Landing Road/Imperial Avenue	One-way Stop Control	14.5	B	21.6	C
9	Crows Landing Road/Algen Avenue	One-way Stop Control	17.4	C	16.5	C
10	Crows Landing Road/Flamingo Drive	One-way Stop Control	23.5	C	18.6	C
11	Crows Landing Road/Whitmore Avenue	Signalized	32.9	C	**44.1**	**D**

Notes:

[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

The Existing Conditions LOS analysis for the purpose of this study is based on an isolated intersection analysis of traffic volumes, rather than analysis of the corridor as a whole. The standalone LOS results sometimes can be misleading if a corridor operates under forced flow, or congested, traffic conditions. Forced flow traffic operations can reduce overall vehicle throughput per hour at intersections, leading to LOS analysis results that suggest there is less corridor congestion than is actually occurring under existing field conditions. Where there is known congestion, additional analysis of field conditions becomes necessary in order to review and evaluate the extent of forced flow operations. TJKM conducted a field review of existing traffic conditions at the study intersections during the prevailing a.m. and p.m. peak periods based on collected traffic counts (7:00-9:00 a.m. and 4:00-6:00 p.m.). The purpose was to identify existing operational conditions at the study intersection that might not be reflected in the preceding existing conditions intersection LOS results. The existing operational conditions at the study intersection reflects the preceding existing conditions intersection LOS results.

Existing Lane Geometry, Traffic Control and Turning Movement Volumes

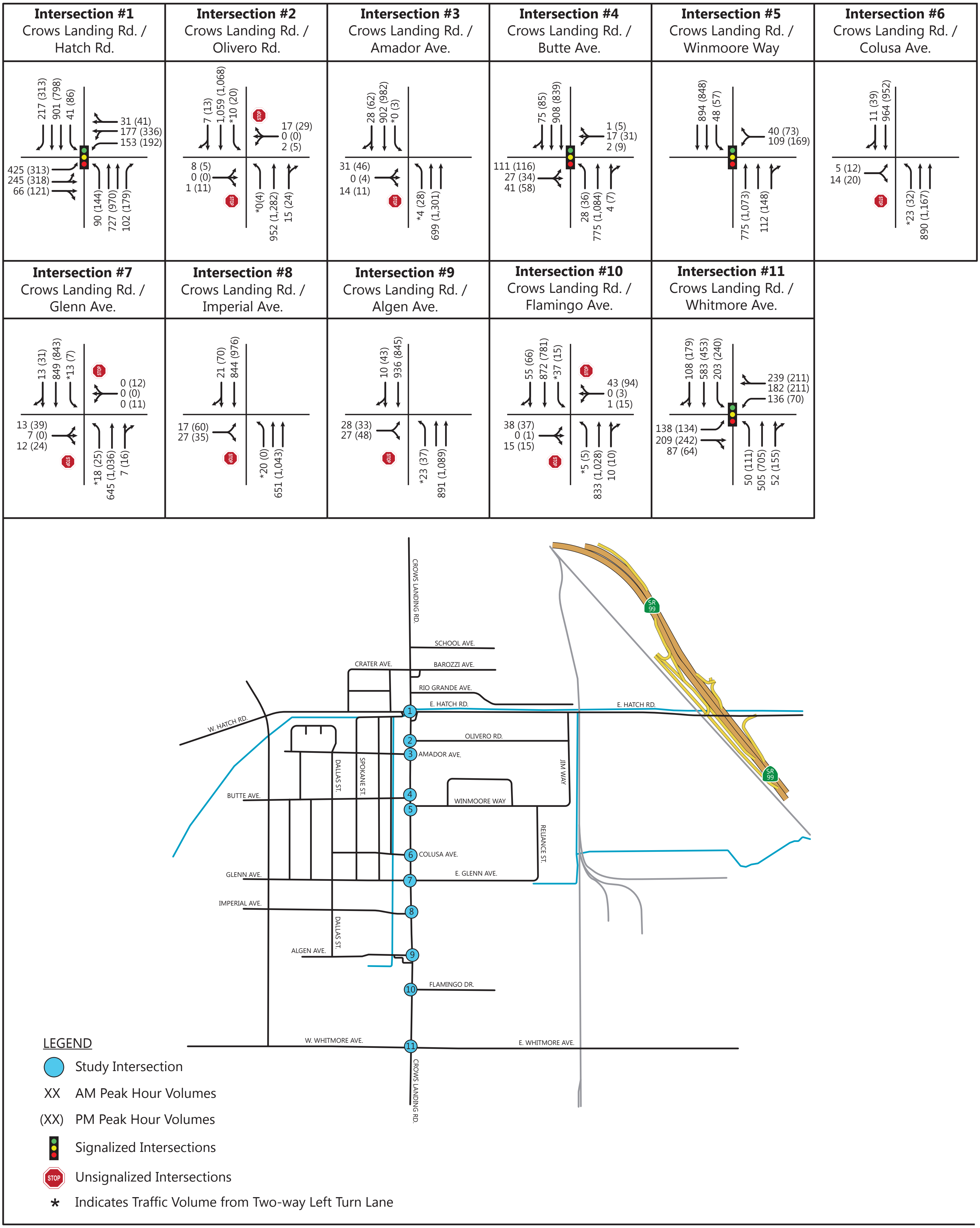


Figure 2

EXISTING PLUS PLANNED ROADWAY IMPROVEMENTS – BUILD ALTERNATIVE

This analysis scenario presents the impacts of the proposed planned improvements at the study intersection and surrounding roadway system. This scenario is similar to Existing Conditions, but with the rerouting of traffic due to the planned improvements along Crows Landing Road.

Future Improvement Concepts

Stanislaus County and the City of Modesto plan to improve the Crows Landing Road corridor between Hatch Road and Whitmore Avenue. The goal of this project is to provide a vibrant multimodal corridor through streetscape treatments including raised medians, street lighting, roadway resurfacing, bicycle facilities and improved pedestrian crossings.

Prior to this analysis, TJKM performed a field review of Crows Landing and collected intersection turning movement volumes, average daily traffic amongst five segments of the corridor, speed and vehicle classification along the one-mile project corridor. **Figure 3** illustrates planned improvements along the study corridor include the following:

- Raised medians throughout the corridor
- Class II Bicycle Lane throughout the corridor with green bike skips at the intersections
- Roadway resurfacing
- Crosswalks at each intersection
- Intersection improvements

Based on field review and collected data, TJKM recommended median island opening locations and turn pocket lengths. The following locations are detailed in **Table 2.**

Impacts due to the addition of median islands along the project corridor strategic access points or median breaks for left turning movements are evaluated under this scenario in order to minimize impact of new median on operations for all modes of transportation.

Also under this scenario, traffic operations were reviewed to provide recommendations on signal timing as well as the potential removal of one of the signalized intersections of Crows Landing Road/Butte Avenue and Crows Landing Road/Winmoore Way. Based on the initial assessment and close proximity of these two intersections TJKM recommends eliminating the intersection of Crows Landing Road/Butte Avenue for better corridor operations. The recommendation is reflected in **Figure 3**. Additionally, TJKM reviewed the potential for the installation of a rectangular rapid flashing beacon (RRFB).

Table 2: Median Island Opening Locations

Opening Location	Movement	Reason
Arco Gas Station/ Jack in the Box driveway, north of Whitmore Avenue	Full access: left turn in and out	Heavy vehicle usage at this driveway
North of Flamingo Drive	Northbound left turn	Access to *Extra Space Storage* driveway for trailer access
Algen Drive	Crows Landing Road/Amador Avenue	One-way Stop Control
Imperial Avenue	Southbound left turn lane into the Crows Landing Road Plaza; Northbound left turn lane to Imperial Avenue	Heavy vehicle usage into the shopping center
Glenn Avenue	Northbound left turn	Movement carried forth per the *City of Modesto Feasibility Study. 2015*
North of Colusa Avenue at FedEx Freight Center	Sought bound left turn access into driveway at FedEx	Large distribution center with heavy truck activity
North of Butte Avenue at Southgate Center	Southbound left turn	Heavy vehicle usage into the shopping center
Amador Avenue	Northbound left turn	One-way Stop Control
9	Crows Landing Road/Algen Avenue	One-way Stop Control
10	Crows Landing Road/Flamingo Drive	One-way Stop Control
11	Crows Landing Road/Whitmore Avenue	Signalized

Intersection Level of Service – Existing plus Planned Roadway Improvements

The intersection LOS analysis results for Existing plus Planned Roadway Improvement Conditions are summarized in **Table 3**. Detailed calculation sheets for Existing plus Planned Roadway Improvement Conditions are contained in **Appendix D**.

Under this scenario, all intersections are expected to continue operating within applicable jurisdictional standards of LOS C (Stanislaus County) and LOS D (City of Modesto) except for the following intersections:

- Crows Landing Road/Hatch Avenue (LOS D during a.m. peak hour and p.m. peak hours)
- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)
- Crows Landing Road/Whitmore Avenue (LOS D during a.m. peak hour and at LOS D during p.m. peak hour)

Figure 4 shows planned lane geometries traffic controls and projected turning movement volumes at all the study intersections for Existing plus Planned Roadway Conditions Scenario.

The results for Existing Conditions are included for comparison purposes.

Table 3: Intersection Level of Service Analysis – Existing plus Planned Roadway Improvements Conditions

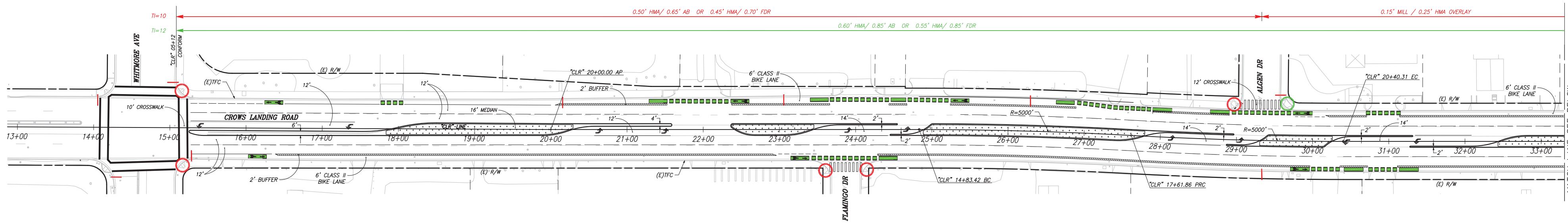
ID	Intersection	Peak Hour	Existing Conditions		Existing plus Planned Roadway Improvements	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Crows Landing Road/Hatch Road	AM	**38.3**	**D**	**38.3**	**D**
		PM	**41.0**	**D**	**41.2**	**D**
2	Crows Landing Road/Olivero Road	AM	17.3	C	12.2	B
		PM	12.3	B	11.3	B
3	Crows Landing Road/Amador Avenue	AM	13.0	B	28.5	D
		PM	20.8	C	**69.4**	**F**
4	Crows Landing Road/Butte Avenue	AM	11.2	B	-	-
		PM	10.1	B	-	-
5	Crows Landing Road/Winmoore Way	AM	10.0	B	13.3	B
		PM	11.4	B	15.9	B
6	Crows Landing Road/Colusa Avenue	AM	12.2	B	12.0	B
		PM	14.0	B	13.8	B
7	Crows Landing Road/Glenn Avenue	AM	16.8	C	11.5	A
		PM	19.8	C	13.6	B
8	Crows Landing Road/Imperial Avenue	AM	14.5	B	12.3	B
		PM	21.6	C	15.1	C
9	Crows Landing Road/Algen Avenue	AM	17.4	C	13.2	B
		PM	16.5	C	13.0	B
10	Crows Landing Road/Flamingo Drive	AM	23.5	C	12.8	B
		PM	18.6	C	12.0	B
11	Crows Landing Road/Whitmore Avenue	AM	32.9	C	32.9	C
		PM	**44.1**	**D**	**44.1**	**D**

Notes:

[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

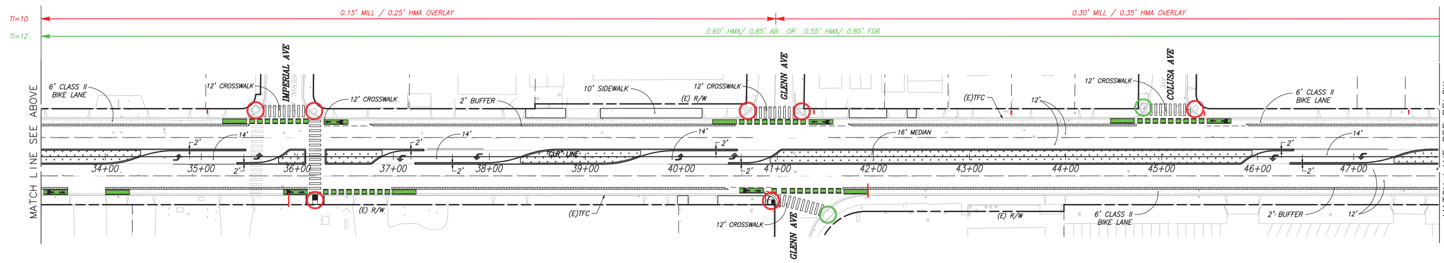


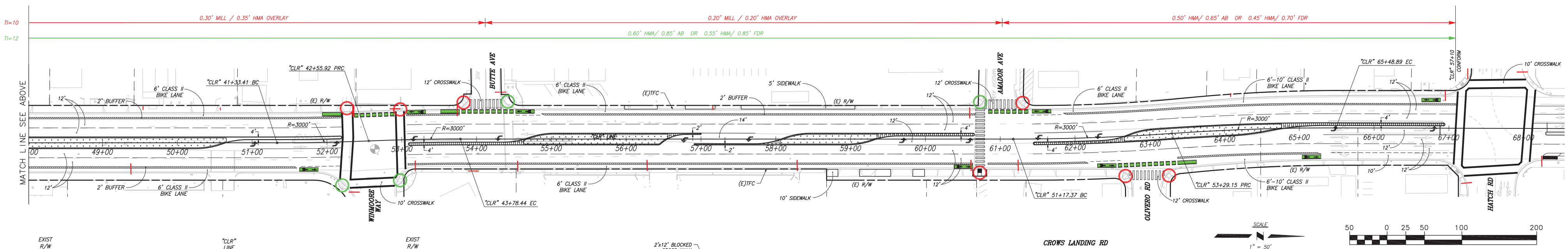
LEGEND

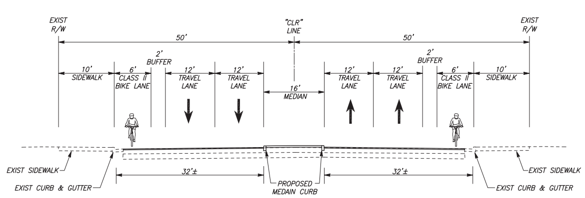
△	ANGLE POINT
∘	BC/EC/PRC
	EXISTING STREET LIGHT
	MODIFY EXISTING SIGNALIZED INTERSECTION
	EXISTING RIGHT OF WAY
	CURB RAMP MODIFICATION
	CURB RAMP FULL REPLACEMENT
	MEDIAN LANDSCAPING

ABBREVIATIONS

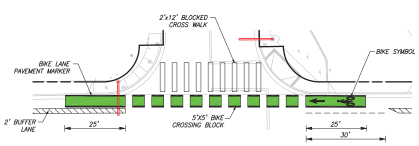
- AB – ASPHALT BASE
- BC – BEGIN CURVE
- C&G – CURB AND GUTTER
- EC – END CURVE
- EP – EDGE OF PAVEMENT
- ETW – EDGE OF TRAVEL WAY
- (E) – EXISTING
- E – EAST
- FDR – FULL DEPTH RECLAMATION
- HMA – HOT MIX ASPHALT
- LT – LEFT
- N – NORTH
- PRC – POINT OF REVERSE IN CURVE
- (P) – PROPOSED
- R – CURVE RADIUS
- RT – RIGHT
- R/W – RIGHT OF WAY
- SHLD – SHOULDER
- STD – STANDARD
- TFC – TOP FACE OF CURB
- TI – TRAFFIC INDEX



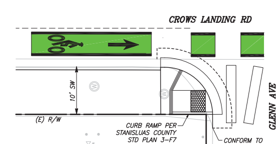




CROWS LANDING ROAD



PAVEMENT DELINEATION DETAIL



GLENN AVE CURB RAMP DETAIL

STANISLAUS COUNTY
DEPARTMENT OF PUBLIC WORKS

CROWS LANDING ROAD
CORRIDOR PROJECT

GEOMETRIC APPROVAL DRAWING

MARK THOMAS
7571 North Remington Ave, Suite 102
Fresno, California 93711

DRAWN BY: KG
CKD BY: JL
DATE: 2/23/2018
SCALE: 1"=50'

JOB NO.
FN-17111

FILE NAME
2018-01-04_GAD.dwg

Existing Plus Planned Roadway Improvements Lane Geometry, Traffic Control and Turning Movement Volumes

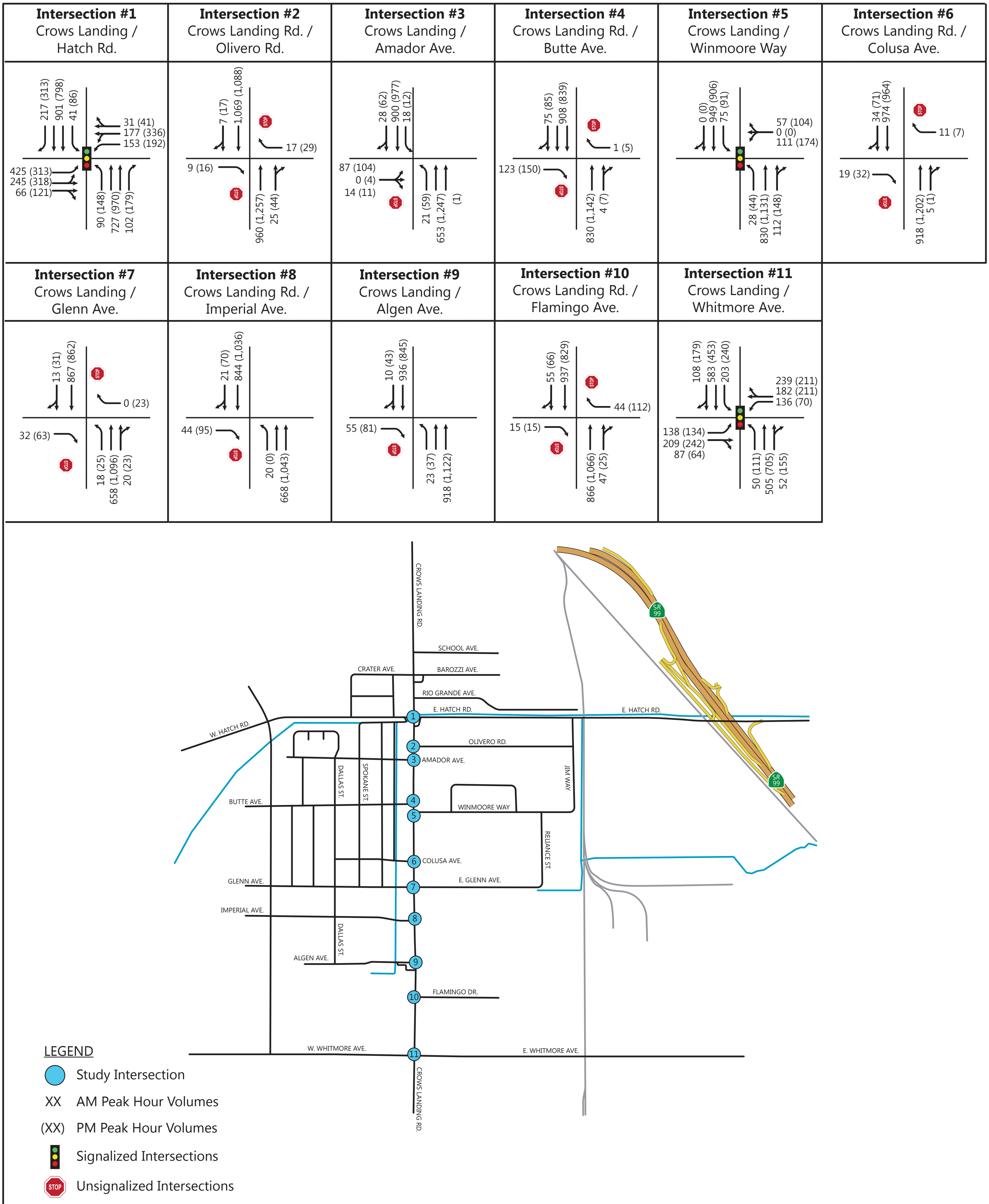


Figure 4

Existing plus Planned Improvements Conditions – Mitigations

Unsignalized Intersection Analysis

Under Existing plus Planned Roadway Improvements Conditions, the following unsignalized intersections operates at deficient LOS due to the major approach volume along Crows Landing Road:

- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)

Crows Landing Road/Amador Avenue

At the intersection of Crows Landing Road/Amador Avenue, the cause of the deficiency is the left turn movement from Amador Avenue onto northbound Crows Landing Road. The eastbound approach from Amador Avenue during the p.m. peak hour is approximately 119 vehicles, of those 104 left turns.

Signal Warrant Analysis

An assessment was made of the need for signalization at the intersections of Crows Landing Road/Amador Avenue and Crows Landing Road/Glenn Avenue. This assessment was made based on the Peak-Hour Volume Signal Warrant (Section 4C.04) described in the California Manual on Uniform Traffic Control Devices (MUTCD). This method makes no evaluation of intersection levels of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Additional analysis may include unsignalized level of service analysis and/or operational analysis such as evaluating vehicle queuing and delay. Other types of traffic control devices, signage, or geometric changes may be preferable based on existing field conditions. Based on the analysis, a traffic signal meets the criteria at both of these study intersections under Existing plus Planned Roadway Improvements Conditions.

The intersection LOS analysis results for mitigated intersections under Existing plus Planned Roadway Improvement Conditions are summarized in **Table 4**. Detailed calculation sheets for the mitigations are contained in **Appendix E**.

Table 4: Existing plus Planned Roadway Improvements Conditions – Mitigations

ID	Intersection	Peak Hour	Existing plus Planned Roadway Improvements			
			No Build Scenario		Build Scenario	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
3	Crows Landing Road/Amador Avenue	PM	**69.4**	**F**	10.9	B

Notes:

[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

CUMULATIVE (YEAR 2040) CONDITIONS – NO BUILD SCENARIO

This section details expected traffic conditions at the study intersections under Cumulative (No Build) Conditions. This analysis scenario is defined as baseline conditions without the proposed improvements in year 2040. This scenario is similar to the Existing Conditions, but with a projected growth rate of 1.15 percent per year applied over 23 years to project traffic demands for the Horizon Year 2040.

The Cumulative Conditions traffic volumes were based on the Stanislaus County Forecast Summary Report published on July 7, 2016. Based on the report, existing traffic volumes are forecasted at a growth rate of 1.15 percent annually for 23 years.

Intersection Level of Service Analysis – Cumulative Conditions

The intersection LOS analysis results for Cumulative Conditions are summarized in **Table 5**. Detailed calculation sheets for Cumulative Conditions are contained in **Appendix F**.

Under this scenario, all intersections are expected to continue operating within applicable jurisdictional standards of LOS C (Stanislaus County) and LOS D (City of Modesto) except for the following intersections:

- Crows Landing Road/Hatch Avenue (LOS E during a.m. peak hour and at LOS F during p.m. peak hour)
- Crows Landing Road/Amador Avenue (LOS E during p.m. peak hour)
- Crows Landing/Imperial Avenue (LOS E during p.m. peak hour)
- Crows Landing/Flamingo Road (LOS E during a.m. peak hour)
- Crows Landing Road/Whitmore Avenue (LOS E during a.m. peak hour and at LOS F during p.m. peak hour)

Figure 5 shows projected turning movement volumes at all of the study intersections for Cumulative Conditions.

TJKM

Table 5: Intersection Level of Service Analysis - Cumulative (Year 2040) Conditions

ID	Intersection	Intersection Control	A.M Peak Hour		P.M. Peak Hour	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Crows Landing Road/Hatch Road	Signalized	**75.1**	**E**	**81.6**	**F**
2	Crows Landing Road/Olivero Road	One-way Stop Control	25.8	D	15.1	C
3	Crows Landing Road/Amador Avenue	One-way Stop Control	16.7	C	**37.8**	**E**
4	Crows Landing Road/Butte Avenue	Signalized	12.5	B	12.1	B
5	Crows Landing Road/Winmoore Way	Signalized	12.0	B	14.7	B
6	Crows Landing Road/Colusa Avenue	One-way Stop Control	13.2	B	16.6	C
7	Crows Landing Road/Glenn Avenue	Two-way Stop Control	20.5	C	30.1	D
8	Crows Landing Road/Imperial Avenue	One-way Stop Control	18.9	C	**42.2**	**E**
9	Crows Landing Road/Algen Avenue	One-way Stop Control	25.2	D	23.9	C
10	Crows Landing Road/Flamingo Drive	One-way Stop Control	**44.7**	**E**	28.0	D
11	Crows Landing Road/Whitmore Avenue	Signalized	**66.5**	**E**	**93.7**	**F**

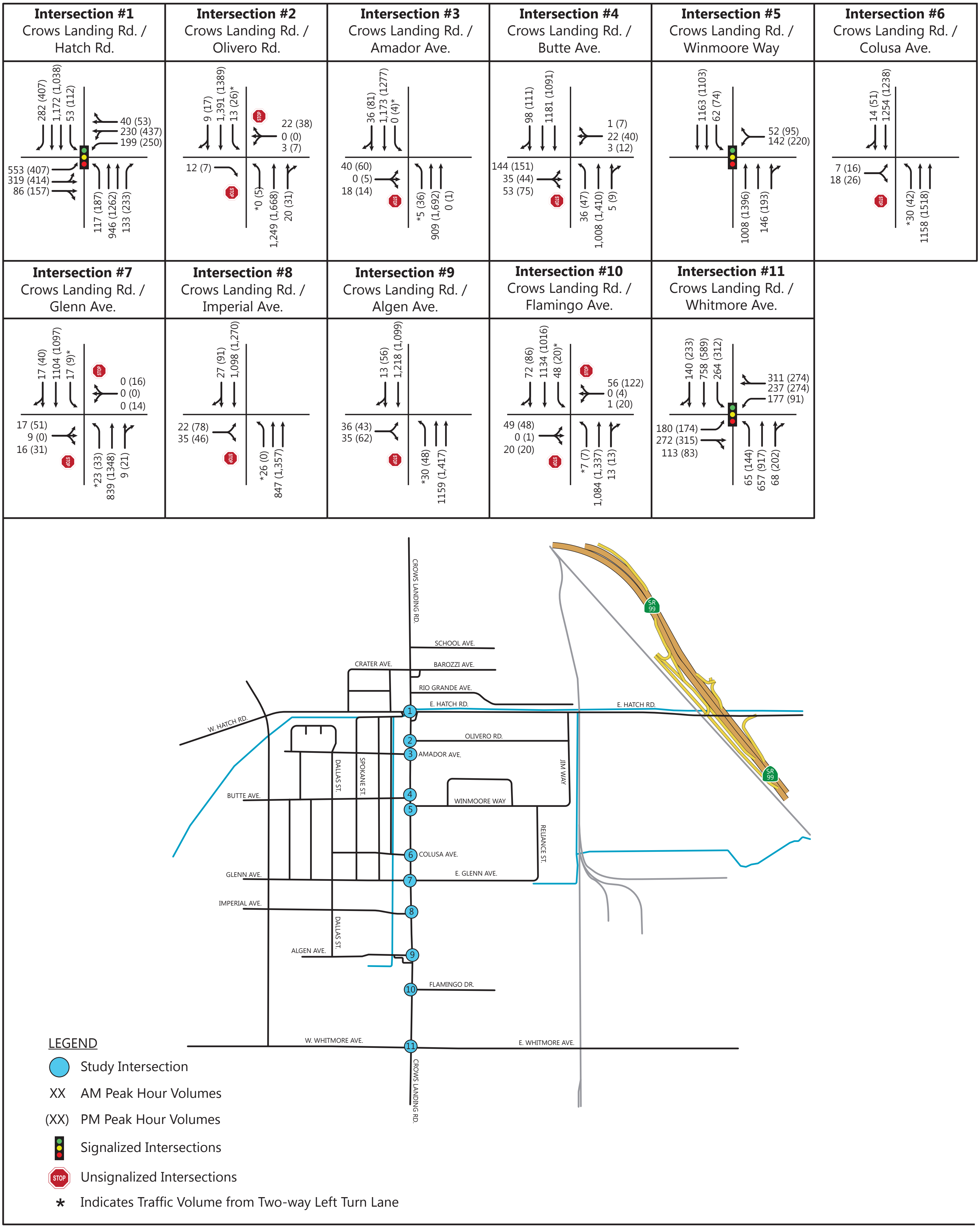
Notes:

[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

Cumulative Lane Geometry, Traffic Control and Turning Movement Volumes



CUMULATIVE PLUS PLANNED ROADWAY IMPROVEMENTS – BUILD ALTERNATIVE

This scenario is similar to the Cumulative Conditions, with the addition of planned roadway improvements. Lane geometries and traffic controls are identical to that assumed under Existing plus Project Conditions.

Figure 4 shows planned lane geometries traffic controls and projected turning movement volumes at all the study intersections for Cumulative plus Planned Roadway Conditions Scenario.

Intersection Level of Service Analysis – Cumulative plus Planned Roadway Improvements Conditions

The intersection LOS analysis results for Cumulative plus Planned Roadway Improvements Conditions are summarized in **Table 6**. Detailed calculation sheets for Cumulative plus Planned Roadway Improvements Conditions are contained in **Appendix G.**

Under this scenario, all intersections are expected to continue operating within applicable jurisdictional standards of LOS C (Stanislaus County) and LOS D (City of Modesto) except for the following intersections:

- Crows Landing Road/Hatch Avenue (LOS E during a.m. peak hour and LOS F during p.m. peak hours)
- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)
- Crows Landing Road/Whitmore Avenue (LOS E during a.m. peak hour and at LOS F during p.m. peak hour)

Figure 6 shows planned lane geometries traffic controls and projected turning movement volumes at all the study intersections for Cumulative plus Planned Roadway Improvements Conditions Scenario.

The results for Cumulative Conditions are included for comparison purposes.

Table 6: Intersection Level of Service Analysis – Cumulative plus Planned Roadway Improvements Conditions

ID	Intersection	Peak Hour	Cumulative Conditions		Cumulative plus Planned Roadway Improvements	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Crows Landing Road/Hatch Road	AM	**75.1**	**E**	**75.1**	**E**
		PM	**81.6**	**F**	**81.6**	**F**
2	Crows Landing Road/Olivero Road	AM	25.8	D	11.4	B
		PM	15.1	C	10.7	B
3	Crows Landing Road/Amador Avenue	AM	16.7	C	26.7	D
		PM	37.8	E	**159.6**	**F**
4	Crows Landing Road/Butte Avenue	AM	12.5	B	-	-
		PM	12.1	B	-	-
5	Crows Landing Road/Winmoore Way	AM	12.0	B	17.5	B
		PM	14.7	B	25.7	C
6	Crows Landing Road/Colusa Avenue	AM	13.2	B	13.8	B
		PM	16.6	C	16.9	C
7	Crows Landing Road/Glenn Avenue	AM	20.5	C	11.1	B
		PM	30.1	D	16.8	C
8	Crows Landing Road/Imperial Avenue	AM	18.9	C	14.6	B
		PM	**42.2**	**E**	21.3	C
9	Crows Landing Road/Algen Avenue	AM	25.2	D	16.3	C
		PM	23.9	C	16.1	C
10	Crows Landing Road/Flamingo Drive	AM	**44.7**	**E**	15.3	C
		PM	28.0	D	13.8	B
11	Crows Landing Road/Whitmore Avenue	AM	**66.5**	**E**	**66.5**	**E**
		PM	**93.7**	**F**	**93.7**	**F**

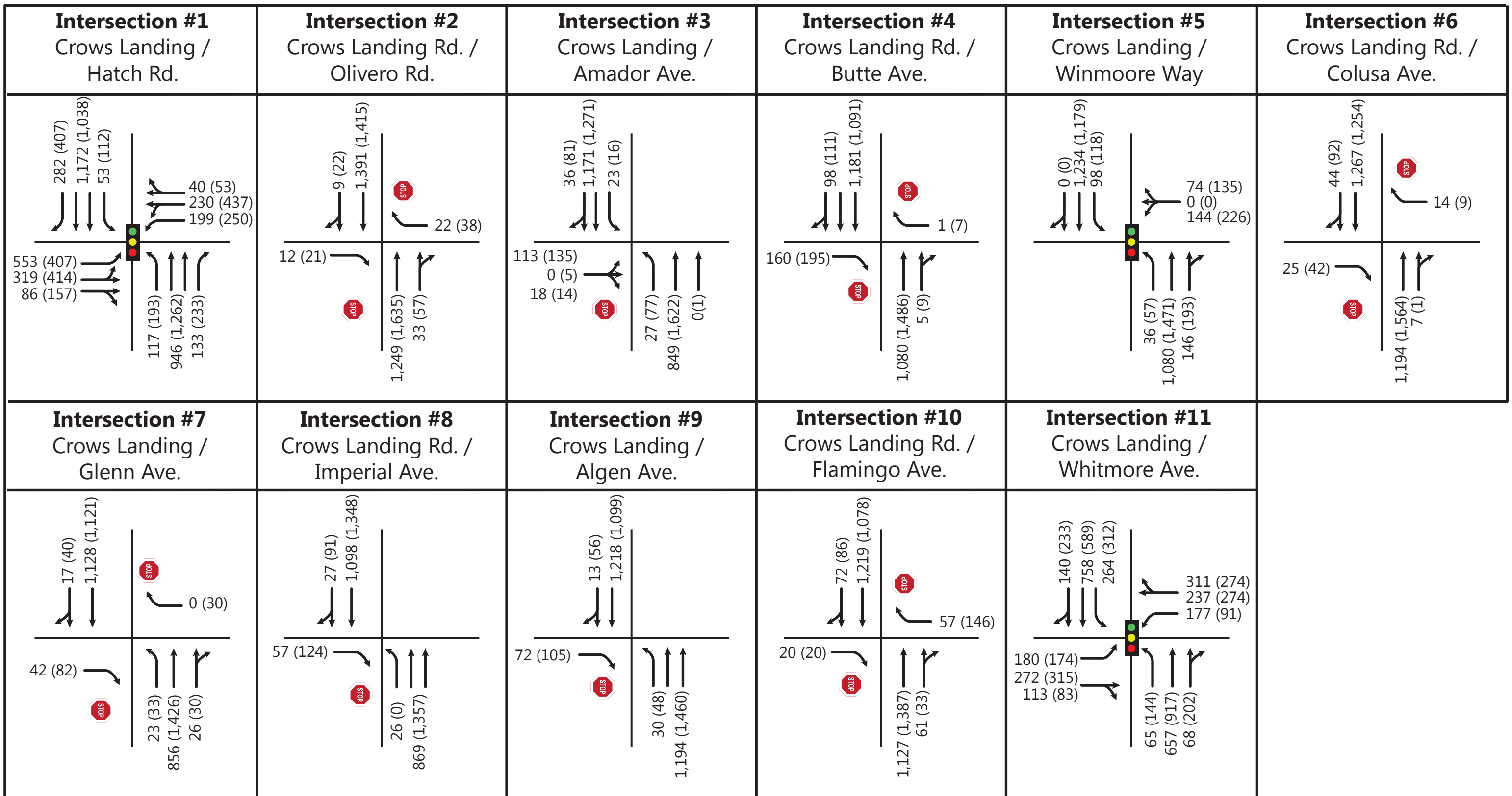
Notes:

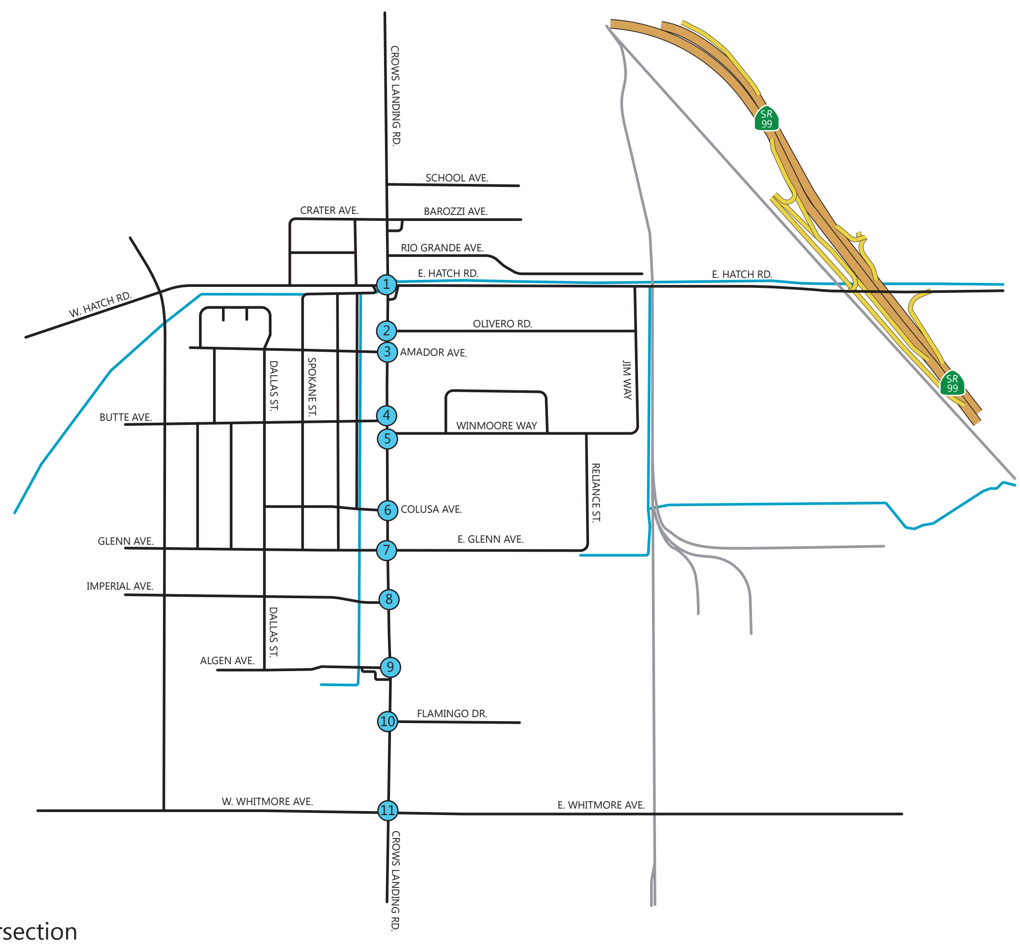
[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

Cumulative Plus Planned Roadway Improvements Lane Geometry, Traffic Control and Turning Movement Volumes





LEGEND

- Study Intersection
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes

Figure 6

Cumulative plus Planned Improvements Conditions - Mitigations

Unsignalized Intersection Analysis

Under Cumulative plus Planned Roadway Improvements Conditions, the following unsignalized intersections operates at deficient LOS due to the major approach volume along Crows Landing Road:

- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)

Crows Landing Road/Amador Avenue

At the intersection of Crows Landing Road/Amador Avenue, the cause of the deficiency is the left turn movement from Amador Avenue onto northbound Crows Landing Road. The eastbound approach from Amador Avenue during the p.m. peak hour is approximately 154 vehicles, of those 135 left turns.

Signal Warrant Analysis

An assessment was made of the need for signalization at the intersections of Crows Landing Road/Amador Avenue Crows Landing Road/Colusa Avenue and Crows Landing Road/Glenn Avenue. This assessment was made based on the Peak-Hour Volume Signal Warrant (Section 4C.04) described in the California Manual on Uniform Traffic Control Devices (MUTCD). This method makes no evaluation of intersection levels of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Additional analysis may include unsignalized level of service analysis and/or operational analysis such as evaluating vehicle queuing and delay. Other types of traffic control devices, signage, or geometric changes may be preferable based on existing field conditions. Based on the analysis, a traffic signal meets the criteria at these three study intersections under Cumulative plus Planned Roadway Improvements Conditions.

The intersection LOS analysis results for mitigated intersections under Cumulative plus Planned Roadway Improvement Conditions are summarized in **Table 7**. Detailed Calculation sheets for the mitigations are contained in **Appendix H**.

Table 7: Cumulative plus Planned Roadway Improvements Conditions – Mitigations

ID	Intersection	Peak Hour	Cumulative plus Planned Roadway Improvements			
			No Build Scenario		Build Scenario	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
3	Crows Landing Road/Amador Avenue	PM	**159.6**	**F**	15.1	B

Notes:

[1]Average intersection delay expressed in seconds per vehicle for signalized intersections. Control delay for the worst movement is presented for side-street stop controlled intersections

[2]LOS = Level of Service

Bold indicates intersections that operate at a deficient Level of Service.

IMPACTS TO BICYCLE AND PEDESTRIAN FACILITIES

Based on the review of existing and cumulative conditions, plus the planned roadway improvements along with the conceptual design of the Crows Landing Road project, the addition of bicycle and pedestrian facilities will improve access to the local businesses, schools, and centers along the corridor. There is no significant impact to the existing facilities with the proposed improvements.

TJKM reviewed additional locations for opportunities for pedestrian crossings. There is an existing pedestrian crossing with a pedestrian-activated rectangular rapid flashing beacons (RRFB) at the intersection of Crows Landing Road/Amador Avenue.

RRFB Warrant Analysis at the intersection of Crows Landing Road and Imperial Avenue

TJKM performed a warrant for a pedestrian crossing with RRFB at the intersection of Imperial Avenue and Crows Landing Road. The California Manual on Uniform Traffic Control Device (CA MUTCD) provides warrant criteria for flashing beacons at crosswalks in Section 4L.101(CA). The RRFB applications at the intersection of Crows Landing Road and Imperial Avenue is evaluated using CA MUTCD. The criteria required are presented in **Table 8**. All warrant criteria are required to be met to provide recommendation for implementation.

Table 8: Flashing Beacons at Crosswalks Warrant Criteria

Criteria	Description
A	The uncontrolled school crossing is on the "Suggested Route to School"
B	At least 40 school pedestrians use the crossing during each of any two hours (not necessarily consecutive) of a normal school day.
C	The crossing is at least 600 feet from the nearest alternate crossing controlled by traffic signals, stop signs or crossing guards.
D	The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas or 140 vehicles per hour in rural areas during the same hour the students are going to and from school during normal school hours.
E	The critical approach speeds exceeds 35 mph or the approach visibility is less than the stopping sight distance.

Source: CA MUTCD Section 4L.101(CA)

A. There is a Bret Harte Elementary School in the vicinity. However, suggested route to school is not present at this intersection.
B. The maximum two-hour counts of pedestrians entering the intersection of Crows Landing Road and Imperial Avenue was Five during a.m. peak hour and eight during p.m. peak hour on a school day. This number represents the summation of pedestrians crossing for all approaches.
C. Existing crosswalks are available on the south leg and west leg at the intersection of Crows Landing Road/Imperial Avenue.

D. During the hours the students are travelling to and from school, the hourly vehicle volume on Crows Landing Road north of Imperial Avenue is approximately 1600 and 1900 vehicles per hour.

E. Speed survey data indicates that critical approach speeds (85th percentile speeds) were 42.1 mph and 40.8 mph for northbound and southbound traffic, respectively; thus 41.5 mph in average. These speeds were significantly higher than the posted limit of 35 mph. Based on field observation, most vehicles did not slow down or stop when approaching the intersections.

A RRFB is not warranted based upon evaluation criteria provided by CA MUTCD Section 4L.101(CA). This is due to Criteria A and Criteria B (pedestrian volume) not fulfilled. **Table 9** summarizes the RRFB warrant analysis by criteria.

Table 9: RRFB Warrant Analysis Summary

Intersection	Crossings	Criteria A	Criteria B	Criteria C	Criteria D	Criteria E	Warrant Met?
Crows Landing Road and Imperial Avenue	South Leg	No	No	Yes	Yes	Yes	No

Source: TJKM, 2018

A RRFB is not warranted for the crosswalk using CA MUTCD 4L.101(CA). TJKM finds the need to perform further analysis based on engineering judgement in that the evaluation results for Criteria D and Criteria E exceeded the thresholds significantly, and would have potential impact on pedestrian safety. Also based on the field observation conducted, an additional pedestrian activated RRFB crosswalk may also be considered north of the project area at the intersection of Crows Landing Road/School Avenue.

TRAFFIC INDEX ANALYSIS

Traffic Index (TI) is a measure of the number of Equivalent Single Axle Loads (ESAL) expected on a traffic lane over the pavement design life of the facility. TI is determined by projecting the ESALs to estimate total accumulated traffic loading during the pavement design life. A method of judging the effect of increased truck traffic on pavement conditions is to compare TI values for Existing Conditions versus Cumulative Conditions.

TJKM collected 24-hour bi-directional vehicle classification traffic volumes for a one-day during the month of November along the following five roadway locations:

1. Crows Landing Road north of Olivero Road
2. Crows Landing Road north of Colusa Avenue
3. Crows Landing Road north of Imperial Avenue
4. Crows Landing Road north of Algen Avenue
5. Crows Landing Road north of Whitmore Avenue

Table 613.3A and Table 613.3C from Chapter 610 in Highway Design Manual was referenced to calculate TI. For purposes of this analysis, the daily volumes were projected by a growth rate of 1.15 percent per year for a Cumulative Year 2040.

Table 9 below summarizes the results of TI analysis for Crows Landing Road study corridor. Detailed TI analysis and calculations are provided in **Appendix I**.

Table 10: Traffic Index Analysis

ID	Roadway Segment	Direction	Existing Conditions		Cumulative Conditions	
			ESAL	TI Calculated	ESAL	TI Calculated
1	Crows Landing Road north of Olivero Road	Northbound	9,588,400	12.0	12,472,731	12.0
		Southbound	7,476,480	11.5	9,725,514	12.0
2	Crows Landing Road north of Colusa Avenue	Northbound	5,731,180	11.0	7,455,203	11.5
		Southbound	7,804,680	11.5	10,152,442	12.0
3	Crows Landing Road north of Imperial Avenue	Northbound	8,323,000	11.5	10,826,680	12.0
		Southbound	6,924,820	11.5	9,007,907	11.5
4	Crows Landing Road north of Algen Avenue	Northbound	7,700,520	11.5	10,016,949	12.0
		Southbound	7,690,300	11.5	10,003,655	12.0
5	Crows Landing Road north of Whitmore Avenue	Northbound	7,268,680	11.5	9,455,205	11.5
		Southbound	8,188,880	11.5	10,652,215	12.0

Notes:
ESAL = Equivalent Single Axle Load;
TI = Traffic Index

CONCLUSIONS

To summarize the Crows Landing Corridor Study analysis, the proposed improvements provides a street environment for all modes of travel.

Existing Conditions

Under Existing conditions, the intersections of Crows Landing Road/Hatch Road operate at an unacceptable LOS D in both the a.m. and p.m. peak hours. The intersection of Crows Landing Road/Whitmore Avenue operates at LOS D in the p.m. peak hour.

Existing plus Planned Roadway Improvements Conditions

Under Existing plus Planned Roadway Improvements Conditions, the following unsignalized intersections operates at deficient LOS due to the major approach volume along Crows Landing Road:

- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)

To mitigate, a signal warrant analysis was completed and found to improve the LOS from F to A.

Cumulative Conditions

Under Cumulative Conditions, the following intersections operate at deficient LOS:

- Crows Landing Road/Hatch Avenue (LOS E during a.m. peak hour and at LOS F during p.m. peak hour)
- Crows Landing Road/Amador Avenue (LOS E during p.m. peak hour)
- Crows Landing/Imperial Avenue (LOS E during p.m. peak hour)
- Crows Landing/Flamingo Road (LOS E during a.m. peak hour)
- Crows Landing Road/Whitmore Avenue (LOS E during a.m. peak hour and at LOS F during p.m. peak hour)

Cumulative plus Planned Roadway Improvements Conditions

Under Cumulative plus Planned Roadway Improvements Conditions, the following unsignalized intersections operates at deficient LOS due to the major approach volume along Crows Landing Road:

- Crows Landing Road/Amador Avenue (LOS F during p.m. peak hour)

To mitigate, a signal warrant analysis was completed and found to improve to acceptable LOS standards.

Bicycle and Pedestrian Facilities

The project improves the multimodal access to the corridor. There are no significant impacts to the bicycle and pedestrian facilities as a result of the project. The existing midblock crossing with a pedestrian-activated rectangular rapid flashing beacons at the intersection of Crows Landing Road/Amador Avenue provides adequate crossing along the corridor.

TJKM also conducted a RRFB warrant analysis for south leg crosswalk at the intersection of Crows Landing Road/Imperial Avenue. Based on the analysis a RRFB is not warranted for the crosswalk using CA MUTCD

4L.101(CA). TJKM finds the need to perform further analysis based on engineering judgement in that the evaluation results for Criteria D and Criteria E exceeded the thresholds significantly, and would have potential impact on pedestrian safety. Also based on the field observation conducted, an additional pedestrian activated RRFB crosswalk may also be considered north of the project area at the intersection of Crows Landing Road/School Avenue.

Appendix A – Level of Service Methodology

LEVEL OF SERVICE METHODOLOGY

LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst. Each level of service represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table A-I.

Table A-I

Level of Service Description

Facility Type	**Uninterrupted Flow**	**Interrupted Flow**
	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term “urban streets” refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.

Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

Level-of-service A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

Level-of-service B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

Level-of-service C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at level-of-service B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

Level-of-service D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. Level-of-service D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

Level-of-service E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

Level-of-service F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine level of service stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table A-II describes the functional and design categories, while Table A-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the level of service is found by comparing the speed to the criteria in Table A-IV. Level-of-service criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table A-II

Functional and Design Categories for Urban Streets

Criterion	**Functional Category**	
	Principal Arterial	**Minor Arterial**
Mobility function	Very important	Important
Access function	Very minor	Substantial
Points connected	Freeways, important activity centers, major traffic generators	Principal arterials
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city	Trips of moderate length within relatively small geographical areas

Criterion	**Design Category**			
	High-Speed	**Suburban**	**Intermediate**	**Urban**
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table A-III

Urban Street Class based on Function and Design Categories

Design Category	**Functional Category**	
	Principal Arterial	**Minor Arterial**
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table A-IV

Urban Street Levels of Service by Class

Urban Street Class	**I**	**II**	**III**	**IV**
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
Level of Service	**Average Travel Speed (mph)**			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, level of service criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A level of service designation is given to the control delay to better describe the level of operation. A description of levels of service for signalized intersections can be found in Table A-V.

Table A-V

Description of Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the level of service criteria listed in Table A-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A level of service designation is given to the expected control delay for each minor movement. Level of service is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table A-VI.

Table A-VI

Description of Level of Service for Two-Way Stop Controlled Intersections

Level of Service	Description
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

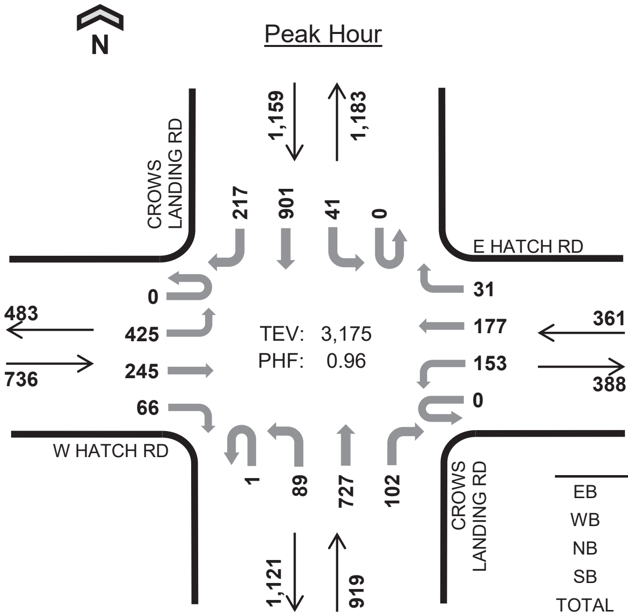
Source: *Highway Capacity Manual 2000*

Appendix B – Existing Turning Movement Counts, Average Daily Traffic

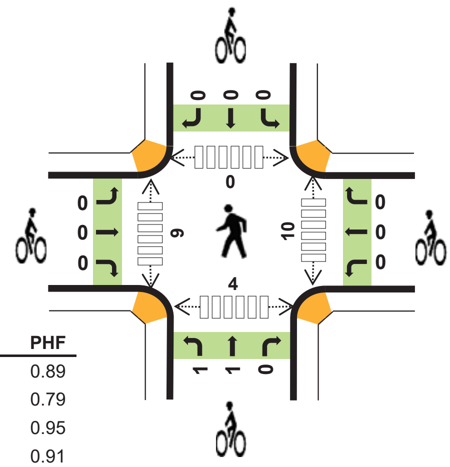
CROWS LANDING RD
W HATCH RD

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	3.4%	0.89
WB	5.0%	0.79
NB	7.8%	0.95
SB	4.6%	0.91
TOTAL	5.3%	0.96



Two-Hour Count Summaries

Interval Start		W HATCH RD Eastbound UT	LT	TH	RT	E HATCH RD Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	64	33	7	0	22	33	7	1	2	120	24	0	6	157	23	499	0
7:15 AM		0	118	62	19	0	22	28	4	0	6	147	24	0	7	174	26	637	0
7:30 AM		**0**	**123**	**74**	**10**	**0**	**37**	**39**	**8**	**0**	**13**	**186**	**22**	**0**	**8**	**199**	**35**	**754**	0
7:45 AM		**0**	**114**	**67**	**18**	**0**	**28**	**28**	**4**	**0**	**22**	**182**	**23**	**0**	**7**	**242**	**47**	**782**	2,672
8:00 AM		**0**	**110**	**54**	**11**	**0**	**48**	**60**	**6**	**1**	**24**	**179**	**37**	**0**	**11**	**217**	**73**	**831**	3,004
8:15 AM		**0**	**78**	**50**	**27**	**0**	**40**	**50**	**13**	**0**	**30**	**180**	**20**	**0**	**15**	**243**	**62**	**808**	**3,175**
8:30 AM		0	67	58	23	0	38	58	15	0	40	159	30	0	11	163	60	722	3,143
8:45 AM		0	75	65	19	0	33	39	14	0	20	156	44	0	17	188	53	723	3,084
Count Total		0	749	463	134	0	268	335	71	2	157	1,309	224	0	82	1,583	379	5,756	0
Peak Hour	**All**	**0**	**425**	**245**	**66**	**0**	**153**	**177**	**31**	**1**	**89**	**727**	**102**	**0**	**41**	**901**	**217**	**3,175**	**0**
	HV	**0**	**9**	**14**	**2**	**0**	**8**	**4**	**6**	**0**	**7**	**55**	**10**	**0**	**3**	**44**	**6**	**168**	**0**
	HV%	**-**	**2%**	**6%**	**3%**	**-**	**5%**	**2%**	**19%**	**0%**	**8%**	**8%**	**10%**	**-**	**7%**	**5%**	**3%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	2	8	30	16	*56*	0	0	0	0	*0*	0	2	1	1	*4*
7:15 AM	1	4	22	22	*49*	0	0	0	0	*0*	2	1	0	4	*7*
7:30 AM	**5**	**2**	**21**	**11**	***39***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**2**	*6*
7:45 AM	**7**	**5**	**18**	**12**	***42***	**0**	**0**	**1**	**0**	***1***	**2**	**3**	**0**	**1**	*6*
8:00 AM	**6**	**5**	**16**	**16**	***43***	**0**	**0**	**0**	**0**	***0***	**4**	**2**	**0**	**0**	*6*
8:15 AM	**7**	**6**	**17**	**14**	***44***	**0**	**0**	**1**	**0**	***1***	**4**	**0**	**0**	**1**	*5*
8:30 AM	4	8	13	17	*42*	0	0	0	0	*0*	1	1	0	1	*3*
8:45 AM	8	6	12	14	*40*	0	0	0	0	*0*	0	1	0	1	*2*
Count Total	40	44	149	122	*355*	0	0	2	0	*2*	13	14	1	11	*39*
Peak Hour	**25**	**18**	**72**	**53**	***168***	**0**	**0**	**2**	**0**	***2***	**10**	**9**	**0**	**4**	***23***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	W HATCH RD Eastbound UT	LT	TH	RT	E HATCH RD Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	1	0	0	5	2	1	0	0	27	3	0	0	15	1	56	0
7:15 AM	0	0	1	0	0	3	1	0	0	2	18	2	0	1	18	3	49	0
7:30 AM	**0**	**4**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**2**	**18**	**1**	**0**	**0**	**10**	**1**	**39**	0
7:45 AM	**0**	**2**	**5**	**0**	**0**	**3**	**2**	**0**	**0**	**1**	**11**	**6**	**0**	**1**	**8**	**3**	**42**	186
8:00 AM	**0**	**2**	**3**	**1**	**0**	**1**	**1**	**3**	**0**	**1**	**14**	**1**	**0**	**1**	**14**	**1**	**43**	173
8:15 AM	**0**	**1**	**5**	**1**	**0**	**3**	**1**	**2**	**0**	**3**	**12**	**2**	**0**	**1**	**12**	**1**	**44**	**168**
8:30 AM	0	3	0	1	0	3	4	1	0	2	10	1	0	3	10	4	42	171
8:45 AM	0	4	4	0	0	5	0	1	0	1	6	5	0	1	13	0	40	169
Count Total	0	17	20	3	0	24	11	9	0	12	116	21	0	8	100	14	355	0
Peak Hour	**0**	**9**	**14**	**2**	**0**	**8**	**4**	**6**	**0**	**7**	**55**	**10**	**0**	**3**	**44**	**6**	**168**	**0**

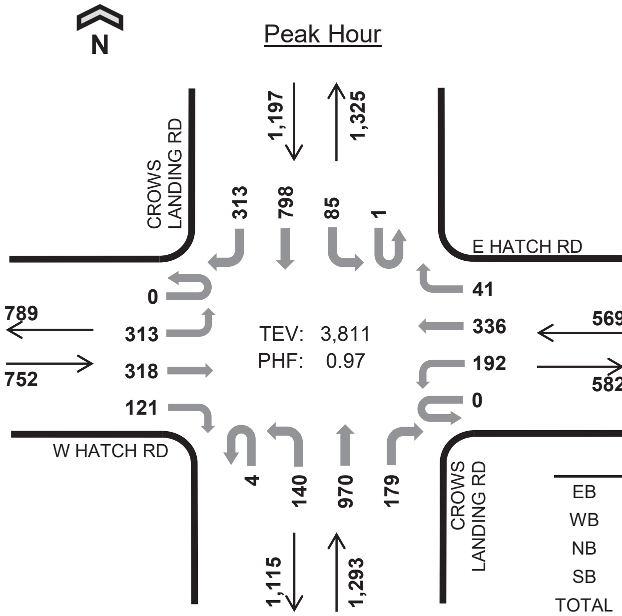
Two-Hour Count Summaries - Bikes

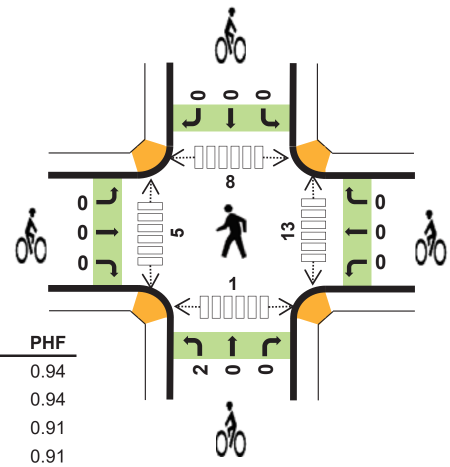
Interval Start	W HATCH RD Eastbound LT	TH	RT	E HATCH RD Westbound LT	TH	RT	CROWS LANDING RD Northbound LT	TH	RT	CROWS LANDING RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**2**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	1	1	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
W HATCH RD

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM





	HV %:	PHF
EB	1.7%	0.94
WB	1.2%	0.94
NB	3.2%	0.91
SB	3.6%	0.91
TOTAL	2.8%	0.97

Two-Hour Count Summaries

Interval Start	W HATCH RD				E HATCH RD				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	67	73	37	0	56	97	11	0	40	225	41	1	18	176	69	911	0
4:15 PM	**0**	**77**	**84**	**19**	**0**	**37**	**84**	**9**	**1**	**35**	**232**	**43**	**0**	**29**	**226**	**74**	**950**	0
4:30 PM	**0**	**86**	**80**	**35**	**0**	**52**	**70**	**15**	**2**	**27**	**224**	**32**	**1**	**25**	**192**	**77**	**918**	0
4:45 PM	**0**	**68**	**73**	**33**	**0**	**50**	**90**	**10**	**1**	**36**	**280**	**40**	**0**	**18**	**208**	**71**	**978**	3,757
5:00 PM	**0**	**82**	**81**	**34**	**0**	**53**	**92**	**7**	**0**	**42**	**234**	**64**	**0**	**13**	**172**	**91**	**965**	**3,811**
5:15 PM	0	81	87	27	0	47	88	13	1	36	219	54	2	18	166	67	906	3,767
5:30 PM	0	63	90	27	0	29	80	9	0	36	230	49	0	17	243	63	936	3,785
5:45 PM	0	60	86	27	0	48	96	9	0	46	198	51	0	20	166	71	878	3,685
Count Total	0	584	654	239	0	372	697	83	5	298	1,842	374	4	158	1,549	583	7,442	0
Peak Hour All	**0**	**313**	**318**	**121**	**0**	**192**	**336**	**41**	**4**	**140**	**970**	**179**	**1**	**85**	**798**	**313**	**3,811**	**0**
Peak Hour HV	**0**	**5**	**6**	**2**	**0**	**4**	**3**	**0**	**0**	**4**	**26**	**12**	**0**	**3**	**34**	**6**	**105**	**0**
Peak Hour HV%	**-**	**2%**	**2%**	**2%**	**-**	**2%**	**1%**	**0%**	**0%**	**3%**	**3%**	**7%**	**0%**	**4%**	**4%**	**2%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	9	10	17	*40*	1	0	0	0	*1*	1	2	2	0	*5*
4:15 PM	**4**	**5**	**9**	**11**	***29***	**0**	**0**	**0**	**0**	***0***	**3**	**2**	**3**	**0**	*8*
4:30 PM	**5**	**1**	**12**	**14**	***32***	**0**	**0**	**0**	**0**	***0***	**7**	**1**	**4**	**0**	*12*
4:45 PM	**1**	**1**	**12**	**10**	***24***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**1**	**1**	*6*
5:00 PM	**3**	**0**	**9**	**8**	***20***	**0**	**0**	**2**	**0**	***2***	**0**	**1**	**0**	**0**	*1*
5:15 PM	5	1	7	6	*19*	0	0	0	0	*0*	1	0	1	0	*2*
5:30 PM	1	2	8	13	*24*	0	0	0	0	*0*	3	4	0	0	*7*
5:45 PM	1	3	6	7	*17*	1	0	0	0	*1*	1	3	0	1	*5*
Count Total	24	22	73	86	*205*	2	0	2	0	*4*	19	14	11	2	*46*
Peak Hour	**13**	**7**	**42**	**43**	***105***	**0**	**0**	**2**	**0**	***2***	**13**	**5**	**8**	**1**	***27***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	W HATCH RD				E HATCH RD				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	2	0	0	4	5	0	0	0	6	4	0	4	11	2	40	0
4:15 PM	**0**	**1**	**2**	**1**	**0**	**3**	**2**	**0**	**0**	**1**	**7**	**1**	**0**	**1**	**8**	**2**	**29**	0
4:30 PM	**0**	**2**	**2**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**12**	**0**	**0**	**2**	**9**	**3**	**32**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**6**	**4**	**0**	**0**	**9**	**1**	**24**	125
5:00 PM	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**7**	**0**	**0**	**8**	**0**	**20**	**105**
5:15 PM	0	1	3	1	0	0	1	0	0	0	6	1	0	0	5	1	19	95
5:30 PM	0	0	1	0	0	1	1	0	0	0	8	0	0	0	12	1	24	87
5:45 PM	0	0	1	0	0	0	3	0	0	0	5	1	0	1	5	1	17	80
Count Total	0	8	13	3	0	9	13	0	0	4	51	18	0	8	67	11	205	0
Peak Hour	**0**	**5**	**6**	**2**	**0**	**4**	**3**	**0**	**0**	**4**	**26**	**12**	**0**	**3**	**34**	**6**	**105**	**0**

Two-Hour Count Summaries - Bikes

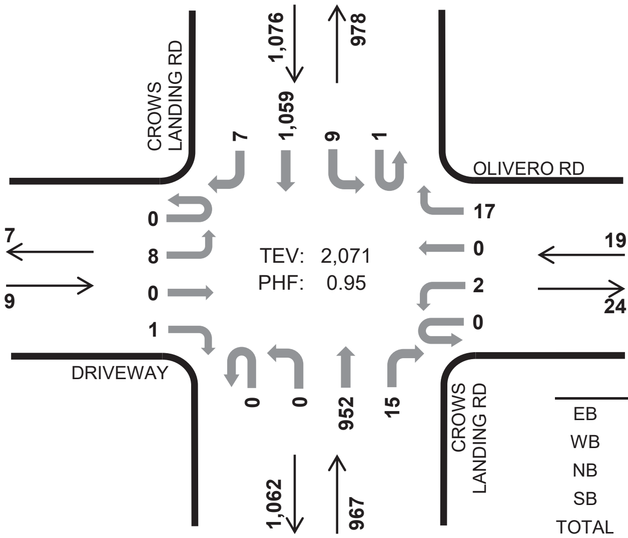
Interval Start	W HATCH RD			E HATCH RD			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	3
Count Total	0	0	2	0	0	0	2	0	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

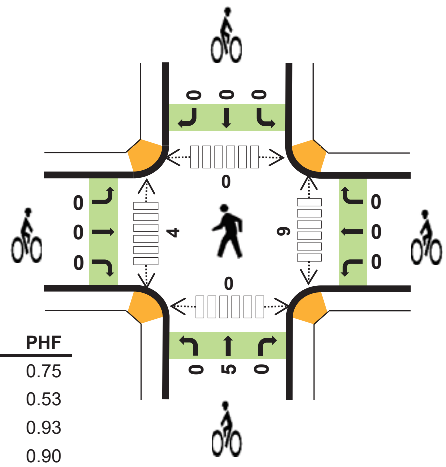
CROWS LANDING RD
OLIVERO RD

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	0.0%	0.75
WB	10.5%	0.53
NB	6.9%	0.93
SB	5.6%	0.90
TOTAL	6.2%	0.95



Two-Hour Count Summaries

Interval Start	DRIVEWAY Eastbound UT	LT	TH	RT	OLIVERO RD Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	2	0	1	0	0	0	7	0	0	148	2	0	2	176	2	340	0
7:15 AM	0	2	0	1	0	0	0	6	0	0	184	0	0	0	206	2	401	0
7:30 AM	0	2	0	1	0	0	0	6	0	0	223	1	0	1	228	1	463	0
7:45 AM	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**224**	**7**	**0**	**1**	**271**	**1**	**510**	1,714
8:00 AM	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**258**	**2**	**0**	**3**	**269**	**3**	**542**	1,916
8:15 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**236**	**4**	**1**	**3**	**291**	**3**	**543**	2,058
8:30 AM	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**8**	**0**	**0**	**234**	**2**	**0**	**2**	**228**	**0**	**476**	**2,071**
8:45 AM	0	1	0	1	0	1	0	2	0	1	235	2	0	1	229	0	473	2,034
Count Total	0	15	0	5	0	3	0	38	0	1	1,742	20	1	13	1,898	12	3,748	0
Peak Hour All	**0**	**8**	**0**	**1**	**0**	**2**	**0**	**17**	**0**	**0**	**952**	**15**	**1**	**9**	**1,059**	**7**	**2,071**	**0**
HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**67**	**0**	**0**	**0**	**59**	**1**	**129**	**0**
HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**12%**	**-**	**-**	**7%**	**0%**	**0%**	**0%**	**6%**	**14%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	3	27	19	*49*	0	0	0	0	*0*	1	0	0	0	*1*
7:15 AM	0	1	20	22	*43*	0	0	1	0	*1*	0	1	0	0	*1*
7:30 AM	0	1	21	11	*33*	0	0	0	0	*0*	2	2	0	0	*4*
7:45 AM	**0**	**1**	**18**	**11**	*30*	**0**	**0**	**2**	**0**	*2*	**1**	**1**	**0**	**0**	*2*
8:00 AM	**0**	**0**	**18**	**18**	*36*	**0**	**0**	**0**	**0**	*0*	**4**	**2**	**0**	**0**	*6*
8:15 AM	**0**	**1**	**15**	**17**	*33*	**0**	**0**	**2**	**0**	*2*	**2**	**1**	**0**	**0**	*3*
8:30 AM	**0**	**0**	**16**	**14**	*30*	**0**	**0**	**1**	**0**	*1*	**2**	**0**	**0**	**0**	*2*
8:45 AM	0	0	10	16	*26*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	7	145	128	*280*	0	0	6	0	*6*	12	7	0	0	*19*
Peak Hour	**0**	**2**	**67**	**60**	***129***	**0**	**0**	**5**	**0**	***5***	**9**	**4**	**0**	**0**	***13***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	DRIVEWAY Eastbound				OLIVERO RD Westbound				CROWS LANDING RD Northbound				CROWS LANDING RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	3	0	0	27	0	0	0	19	0	49	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	20	0	0	0	22	0	43	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	21	0	0	0	11	0	33	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**18**	**0**	**0**	**0**	**11**	**0**	**30**	155
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**18**	**0**	**36**	142
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**15**	**0**	**0**	**0**	**16**	**1**	**33**	132
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**14**	**0**	**30**	**129**
8:45 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	16	0	26	125
Count Total	0	0	0	0	0	0	0	7	0	0	145	0	0	0	127	1	280	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**67**	**0**	**0**	**0**	**59**	**1**	**129**	**0**

Two-Hour Count Summaries - Bikes

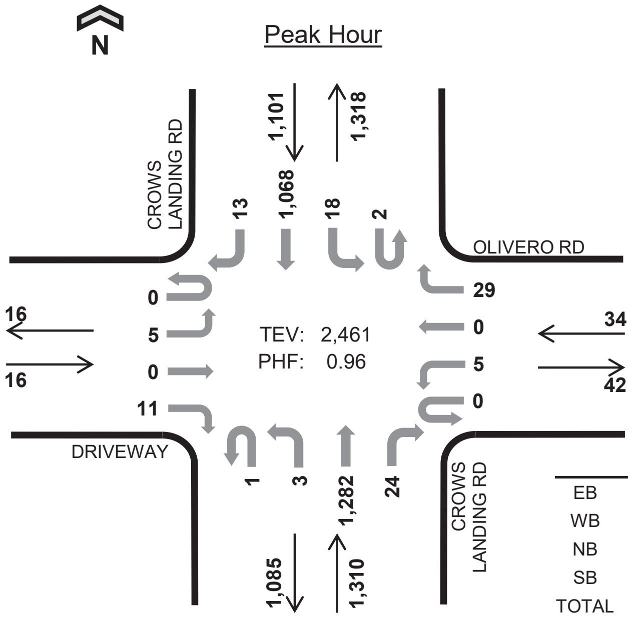
Interval Start	DRIVEWAY Eastbound			OLIVERO RD Westbound			CROWS LANDING RD Northbound			CROWS LANDING RD Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	4
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**5**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	0	0	0	0	6	0	0	0	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**5**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

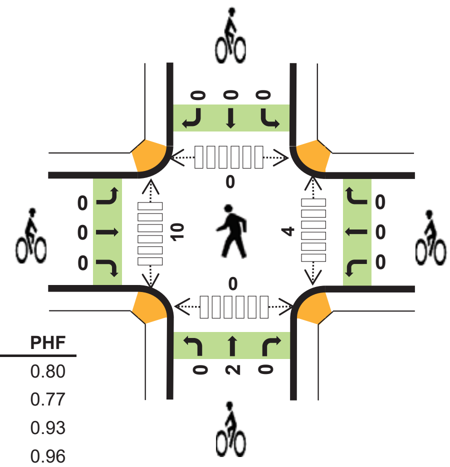
CROWS LANDING RD
OLIVERO RD

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.80
WB	0.0%	0.77
NB	3.1%	0.93
SB	3.9%	0.96
TOTAL	3.4%	0.96



Two-Hour Count Summaries

Interval Start	DRIVEWAY Eastbound UT	LT	TH	RT	OLIVERO RD Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	1	1	1	0	0	0	4	0	0	309	3	1	5	237	2	564	0
4:15 PM	**0**	**3**	**0**	**1**	**0**	**2**	**0**	**5**	**0**	**1**	**290**	**5**	**0**	**7**	**261**	**1**	**576**	0
4:30 PM	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**6**	**1**	**0**	**315**	**7**	**0**	**4**	**277**	**6**	**621**	0
4:45 PM	**0**	**1**	**0**	**2**	**0**	**2**	**0**	**8**	**0**	**2**	**332**	**5**	**1**	**5**	**266**	**2**	**626**	2,387
5:00 PM	**0**	**1**	**0**	**3**	**0**	**1**	**0**	**10**	**0**	**0**	**345**	**7**	**1**	**2**	**264**	**4**	**638**	**2,461**
5:15 PM	0	1	0	4	0	0	0	8	0	0	307	11	0	0	220	3	554	2,439
5:30 PM	0	1	0	2	0	3	1	6	0	1	296	11	2	2	259	4	588	2,406
5:45 PM	0	2	0	1	0	8	0	8	0	0	303	12	0	7	218	4	563	2,343
Count Total	0	10	1	19	0	16	1	55	1	4	2,497	61	5	32	2,002	26	4,730	0
Peak Hour All	**0**	**5**	**0**	**11**	**0**	**5**	**0**	**29**	**1**	**3**	**1,282**	**24**	**2**	**18**	**1,068**	**13**	**2,461**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**41**	**0**	**0**	**0**	**42**	**1**	**84**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**0%**	**0%**	**3%**	**0%**	**0%**	**0%**	**4%**	**8%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	9	15	*24*	0	0	0	0	*0*	2	2	0	0	*4*
4:15 PM	**0**	**0**	**10**	**12**	***22***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:30 PM	**0**	**0**	**11**	**11**	***22***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**13**	**11**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**5**	**0**	**0**	*5*
5:00 PM	**0**	**0**	**7**	**9**	***16***	**0**	**0**	**2**	**0**	***2***	**4**	**3**	**0**	**0**	*7*
5:15 PM	0	0	8	5	*13*	0	0	0	1	*1*	2	0	0	0	*2*
5:30 PM	0	0	8	10	*18*	0	0	0	1	*1*	3	3	0	0	*6*
5:45 PM	0	0	5	5	*10*	0	0	1	0	*1*	1	1	0	0	*2*
Count Total	0	0	71	78	*149*	0	0	3	2	*5*	12	16	0	0	*28*
Peak Hour	**0**	**0**	**41**	**43**	***84***	**0**	**0**	**2**	**0**	***2***	**4**	**10**	**0**	**0**	***14***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	DRIVEWAY Eastbound				OLIVERO RD Westbound				CROWS LANDING RD Northbound				CROWS LANDING RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	15	0	24	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**12**	**0**	**22**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**10**	**1**	**22**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**11**	**0**	**24**	92
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**9**	**0**	**16**	**84**
5:15 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	5	0	13	75
5:30 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	10	0	18	71
5:45 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	10	57
Count Total	0	0	0	0	0	0	0	0	0	0	71	0	0	0	77	1	149	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**41**	**0**	**0**	**0**	**42**	**1**	**84**	**0**

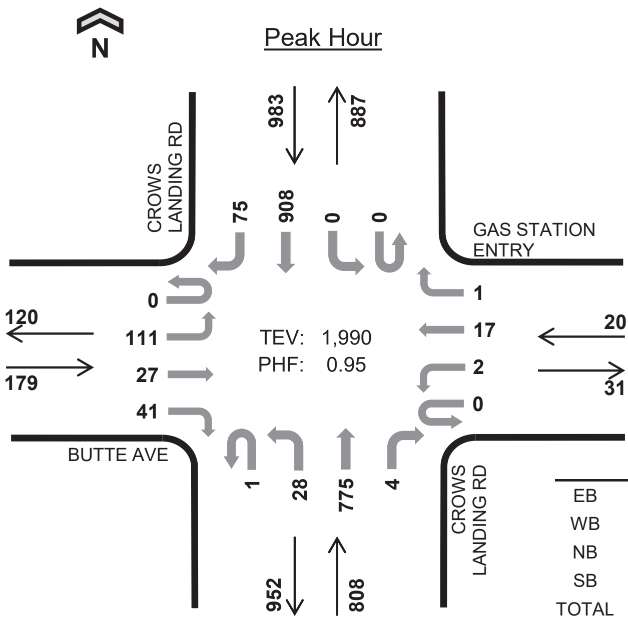
Two-Hour Count Summaries - Bikes

Interval Start	DRIVEWAY Eastbound			OLIVERO RD Westbound			CROWS LANDING RD Northbound			CROWS LANDING RD Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**2**
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	3
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	4
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	5
Count Total	0	0	0	0	0	0	0	3	0	1	1	0	5	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**

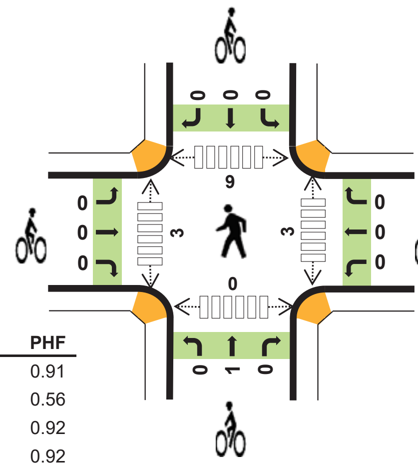
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
BUTTE AVE

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	1.7%	0.91
WB	0.0%	0.56
NB	7.4%	0.92
SB	5.7%	0.92
TOTAL	6.0%	0.95



Two-Hour Count Summaries

Interval Start	BUTTE AVE Eastbound UT	LT	TH	RT	GAS STATION ENTRY Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	23	1	2	0	0	0	0	0	0	131	0	0	0	150	5	312	0
7:15 AM	0	22	4	6	0	0	2	0	0	3	139	0	0	0	203	7	386	0
7:30 AM	0	29	1	3	0	0	0	0	0	2	187	0	0	0	206	7	435	0
7:45 AM	**0**	**26**	**6**	**7**	**0**	**0**	**2**	**0**	**0**	**8**	**188**	**1**	**0**	**0**	**254**	**14**	**506**	1,639
8:00 AM	**0**	**30**	**6**	**10**	**0**	**0**	**1**	**0**	**1**	**3**	**195**	**0**	**0**	**0**	**230**	**25**	**501**	1,828
8:15 AM	**0**	**24**	**7**	**14**	**0**	**1**	**8**	**0**	**0**	**11**	**207**	**2**	**0**	**0**	**234**	**18**	**526**	1,968
8:30 AM	**0**	**31**	**8**	**10**	**0**	**1**	**6**	**1**	**0**	**6**	**185**	**1**	**0**	**0**	**190**	**18**	**457**	**1,990**
8:45 AM	0	30	2	10	0	1	1	0	0	7	204	1	0	0	196	21	473	1,957
Count Total	0	215	35	62	0	3	20	1	1	40	1,436	5	0	0	1,663	115	3,596	0
Peak Hour All	**0**	**111**	**27**	**41**	**0**	**2**	**17**	**1**	**1**	**28**	**775**	**4**	**0**	**0**	**908**	**75**	**1,990**	**0**
Peak Hour HV	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**59**	**0**	**0**	**0**	**53**	**3**	**119**	**0**
Peak Hour HV%	**-**	**2%**	**0%**	**2%**	**-**	**0%**	**0%**	**0%**	**0%**	**4%**	**8%**	**0%**	**-**	**-**	**6%**	**4%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	5	0	22	14	*41*	0	0	0	0	*0*	0	0	1	0	*1*
7:15 AM	0	0	18	26	*44*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	1	0	21	8	*30*	0	0	0	0	*0*	0	0	2	0	*2*
7:45 AM	**1**	**0**	**12**	**11**	***24***	**0**	**0**	**0**	**0**	***0***	**1**	**2**	**0**	**0**	*3*
8:00 AM	**0**	**0**	**18**	**15**	***33***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**3**	**0**	*5*
8:15 AM	**1**	**0**	**16**	**19**	***36***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**2**	**0**	*2*
8:30 AM	**1**	**0**	**14**	**11**	***26***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**4**	**0**	*5*
8:45 AM	1	0	8	18	*27*	0	0	0	0	*0*	0	2	0	0	*2*
Count Total	10	0	129	122	*261*	0	0	1	0	*1*	3	5	13	0	*21*
Peak Hour	**3**	**0**	**60**	**56**	***119***	**0**	**0**	**1**	**0**	***1***	**3**	**3**	**9**	**0**	***15***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	BUTTE AVE Eastbound				GAS STATION ENTRY Westbound				CROWS LANDING RD Northbound				CROWS LANDING RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	5	0	0	0	0	0	0	0	0	22	0	0	0	14	0	41	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	26	0	44	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	21	0	0	0	8	0	30	0
7:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**9**	**2**	**24**	139
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**15**	**0**	**33**	131
8:15 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**15**	**0**	**0**	**0**	**18**	**1**	**36**	123
8:30 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**11**	**0**	**26**	**119**
8:45 AM	0	1	0	0	0	0	0	0	0	0	8	0	0	0	17	1	27	122
Count Total	0	9	0	1	0	0	0	0	0	1	128	0	0	0	118	4	261	0
Peak Hour	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**59**	**0**	**0**	**0**	**53**	**3**	**119**	**0**

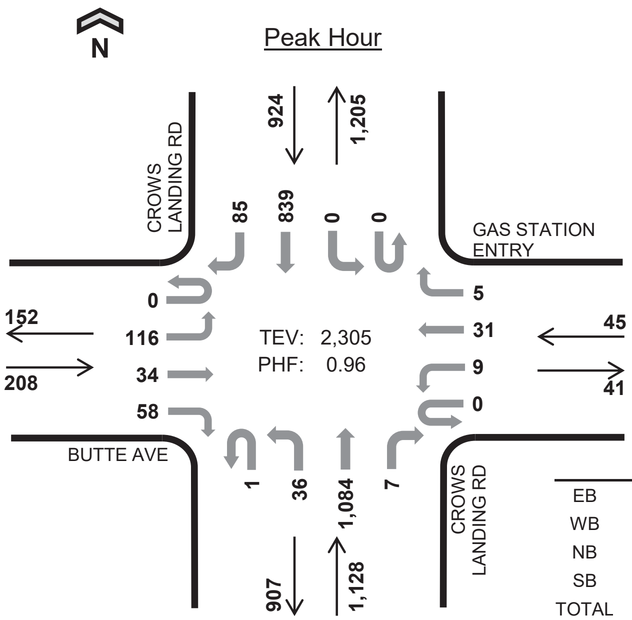
Two-Hour Count Summaries - Bikes

Interval Start	BUTTE AVE Eastbound			GAS STATION ENTRY Westbound			CROWS LANDING RD Northbound			CROWS LANDING RD Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	1
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

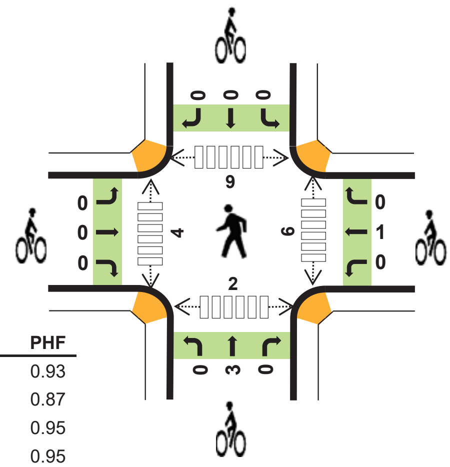
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
BUTTE AVE

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.5%	0.93
WB	0.0%	0.87
NB	3.4%	0.95
SB	3.9%	0.95
TOTAL	3.3%	0.96



Two-Hour Count Summaries

Interval Start	BUTTE AVE Eastbound UT	LT	TH	RT	GAS STATION ENTRY Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	31	10	13	0	3	8	0	0	2	266	2	0	0	204	17	556	0
4:15 PM	0	29	6	15	0	1	3	1	0	5	227	2	0	1	184	18	492	0
4:30 PM	**0**	**26**	**8**	**14**	**0**	**3**	**8**	**1**	**0**	**4**	**269**	**1**	**0**	**0**	**213**	**20**	**567**	0
4:45 PM	**0**	**26**	**10**	**12**	**0**	**2**	**10**	**1**	**0**	**11**	**282**	**3**	**0**	**0**	**211**	**32**	**600**	2,215
5:00 PM	**0**	**33**	**6**	**17**	**0**	**2**	**7**	**0**	**0**	**14**	**282**	**1**	**0**	**0**	**216**	**18**	**596**	2,255
5:15 PM	**0**	**31**	**10**	**15**	**0**	**2**	**6**	**3**	**1**	**7**	**251**	**2**	**0**	**0**	**199**	**15**	**542**	**2,305**
5:30 PM	0	30	4	11	0	0	8	0	0	4	251	1	0	0	204	23	536	2,274
5:45 PM	0	25	13	11	0	3	5	1	0	10	257	0	0	0	210	11	546	2,220
Count Total	0	231	67	108	0	16	55	7	1	57	2,085	12	0	1	1,641	154	4,435	0
Peak Hour All	**0**	**116**	**34**	**58**	**0**	**9**	**31**	**5**	**1**	**36**	**1,084**	**7**	**0**	**0**	**839**	**85**	**2,305**	**0**
Peak Hour HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	**0**	**0**	**0**	**35**	**1**	**75**	**0**
Peak Hour HV%	**-**	**1%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**0%**	**0%**	**4%**	**0%**	**-**	**-**	**4%**	**1%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	2	0	7	18	*27*	0	0	0	0	*0*	0	3	1	0	*4*
4:15 PM	0	0	10	9	*19*	0	0	0	0	*0*	1	1	2	0	*4*
4:30 PM	**0**	**0**	**12**	**10**	***22***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**2**	**0**	*3*
4:45 PM	**0**	**0**	**11**	**9**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**10**	**10**	***20***	**0**	**1**	**3**	**0**	***4***	**5**	**0**	**5**	**1**	*11*
5:15 PM	**1**	**0**	**5**	**7**	***13***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**2**	**1**	*7*
5:30 PM	0	0	7	14	*21*	0	0	0	0	*0*	0	0	1	0	*1*
5:45 PM	1	0	6	6	*13*	0	0	0	0	*0*	0	1	1	0	*2*
Count Total	4	0	68	83	*155*	0	1	3	0	*4*	7	9	14	2	*32*
Peak Hour	**1**	**0**	**38**	**36**	***75***	**0**	**1**	**3**	**0**	***4***	**6**	**4**	**9**	**2**	***21***

Project Manager: (415) 310-6469 project.manager.ca@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	BUTTE AVE Eastbound UT	LT	TH	RT	GAS STATION ENTRY Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	2	0	0	0	0	0	0	0	0	7	0	0	0	17	1	27	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	9	0	19	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**9**	**1**	**22**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**9**	**0**	**20**	88
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**10**	**0**	**20**	81
5:15 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**7**	**0**	**13**	**75**
5:30 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	13	1	21	74
5:45 PM	0	0	1	0	0	0	0	0	0	0	6	0	0	0	6	0	13	67
Count Total	0	3	1	0	0	0	0	0	0	0	68	0	0	0	80	3	155	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	**0**	**0**	**0**	**35**	**1**	**75**	**0**

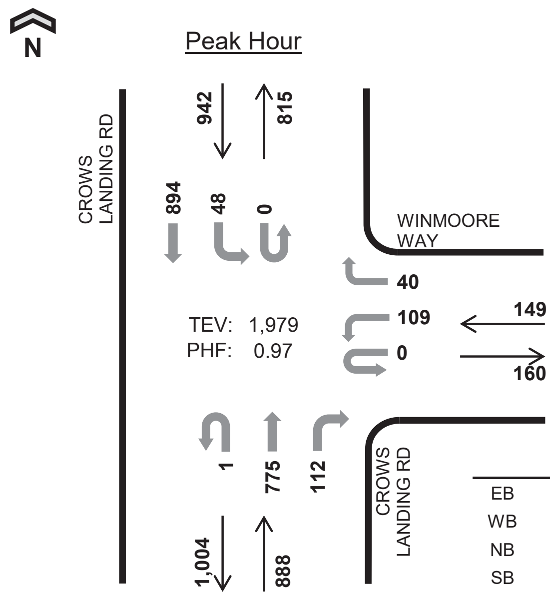
Two-Hour Count Summaries - Bikes

Interval Start	BUTTE AVE Eastbound LT	TH	RT	GAS STATION ENTRY Westbound LT	TH	RT	CROWS LANDING RD Northbound LT	TH	RT	CROWS LANDING RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**4**	4
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	0	0	1	0	0	3	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**4**	**0**

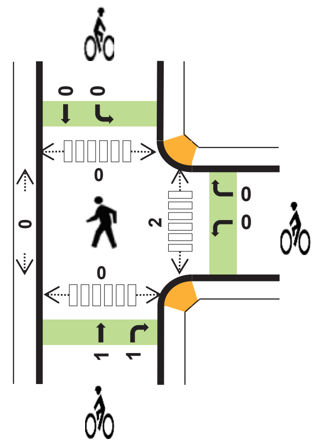
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
WINMOORE WAY

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	-	-
WB	6.0%	0.65
NB	6.1%	0.94
SB	5.7%	0.92
TOTAL	5.9%	0.97



Two-Hour Count Summaries

Interval Start	0				WINMOORE WAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	11	0	2	0	0	124	12	0	2	154	0	305	0
7:15 AM	0	0	0	0	0	8	0	4	0	0	147	14	1	3	216	0	393	0
7:30 AM	0	0	0	0	0	16	0	5	0	0	172	26	0	4	198	0	421	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**26**	**0**	**7**	**0**	**0**	**184**	**31**	**0**	**12**	**244**	**0**	**504**	1,623
8:00 AM	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**9**	**1**	**0**	**198**	**28**	**0**	**5**	**235**	**0**	**496**	1,814
8:15 AM	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**10**	**0**	**0**	**207**	**29**	**0**	**17**	**228**	**0**	**511**	1,932
8:30 AM	**0**	**0**	**0**	**0**	**0**	**43**	**0**	**14**	**0**	**0**	**186**	**24**	**0**	**14**	**187**	**0**	**468**	**1,979**
8:45 AM	0	0	0	0	0	14	0	20	0	0	194	24	0	16	195	0	463	1,938
Count Total	0	0	0	0	0	158	0	71	1	0	1,412	188	1	73	1,657	0	3,561	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**109**	**0**	**40**	**1**	**0**	**775**	**112**	**0**	**48**	**894**	**0**	**1,979**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**7**	**0**	**0**	**51**	**3**	**0**	**5**	**49**	**0**	**117**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**2%**	**-**	**18%**	**0%**	**-**	**7%**	**3%**	**-**	**10%**	**5%**	**-**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	22	15	*37*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	1	17	24	*42*	0	0	0	0	*0*	1	0	0	0	*1*
7:30 AM	0	4	18	8	*30*	0	0	0	0	*0*	1	0	0	0	*1*
7:45 AM	**0**	**2**	**12**	**10**	***24***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:00 AM	**0**	**1**	**16**	**16**	***33***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**3**	**15**	**16**	***34***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	*1*
8:30 AM	**0**	**3**	**11**	**12**	***26***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:45 AM	0	2	8	18	*28*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	16	119	119	*254*	0	0	2	0	*2*	4	0	0	0	*4*
Peak Hr	**0**	**9**	**54**	**54**	***117***	**0**	**0**	**2**	**0**	***2***	**2**	**0**	**0**	**0**	***2***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				WINMOORE WAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	22	0	0	1	14	0	37	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	17	0	0	0	24	0	42	0
7:30 AM	0	0	0	0	0	2	0	2	0	0	17	1	0	0	8	0	30	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**11**	**1**	**0**	**0**	**10**	**0**	**24**	133
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**15**	**1**	**0**	**0**	**16**	**0**	**33**	129
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**14**	**1**	**0**	**4**	**12**	**0**	**34**	121
8:30 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**11**	**0**	**0**	**1**	**11**	**0**	**26**	**117**
8:45 AM	0	0	0	0	0	0	0	2	0	0	8	0	0	1	17	0	28	121
Count Total	0	0	0	0	0	4	0	12	0	0	115	4	0	7	112	0	254	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**7**	**0**	**0**	**51**	**3**	**0**	**5**	**49**	**0**	**117**	**0**

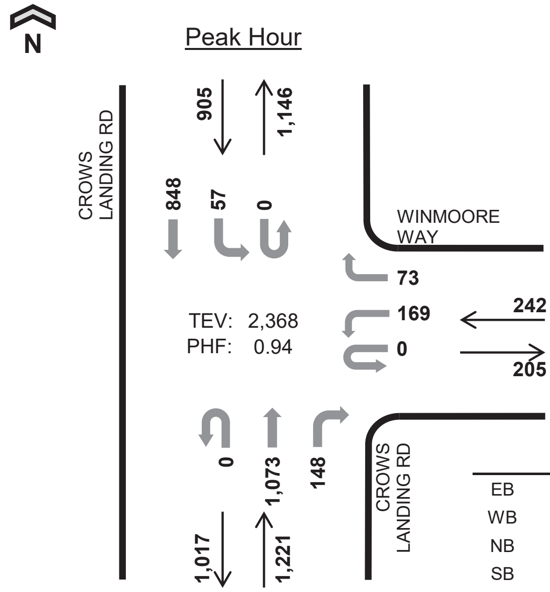
Two-Hour Count Summaries - Bikes

Interval Start	0			WINMOORE WAY			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	1
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	0	0	0	1	1	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**

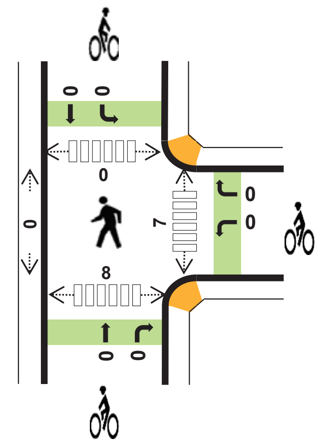
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
WINMOORE WAY

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	-	-
WB	3.3%	0.85
NB	2.9%	0.93
SB	3.9%	0.97
TOTAL	3.3%	0.94



Two-Hour Count Summaries

Interval Start	0				WINMOORE WAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	48	0	20	0	0	260	32	0	12	214	0	586	0
4:15 PM	0	0	0	0	0	38	0	14	0	0	213	45	0	14	189	0	513	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**43**	**0**	**13**	**0**	**0**	**264**	**33**	**0**	**14**	**213**	**0**	**580**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**55**	**0**	**16**	**0**	**0**	**291**	**39**	**0**	**16**	**212**	**0**	**629**	2,308
5:00 PM	**0**	**0**	**0**	**0**	**0**	**36**	**0**	**31**	**0**	**0**	**268**	**43**	**0**	**17**	**216**	**0**	**611**	2,333
5:15 PM	**0**	**0**	**0**	**0**	**0**	**35**	**0**	**13**	**0**	**0**	**250**	**33**	**0**	**10**	**207**	**0**	**548**	**2,368**
5:30 PM	0	0	0	0	0	39	0	11	0	0	252	37	0	5	212	0	556	2,344
5:45 PM	0	0	0	0	0	42	0	15	0	0	259	31	0	8	219	0	574	2,289
Count Total	0	0	0	0	0	336	0	133	0	0	2,057	293	0	96	1,682	0	4,597	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**169**	**0**	**73**	**0**	**0**	**1,073**	**148**	**0**	**57**	**848**	**0**	**2,368**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**3**	**0**	**0**	**34**	**1**	**0**	**5**	**30**	**0**	**78**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**3%**	**-**	**4%**	**-**	**-**	**3%**	**1%**	**-**	**9%**	**4%**	**-**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	3	8	18	*29*	0	0	0	0	*0*	2	0	0	2	*4*
4:15 PM	0	1	11	9	*21*	0	0	0	0	*0*	0	0	0	1	*1*
4:30 PM	**0**	**2**	**10**	**9**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
4:45 PM	**0**	**2**	**10**	**9**	***21***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**1**	*3*
5:00 PM	**0**	**0**	**10**	**10**	***20***	**0**	**0**	**0**	**0**	***0***	**5**	**0**	**0**	**3**	*8*
5:15 PM	**0**	**4**	**5**	**7**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
5:30 PM	0	4	8	12	*24*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	6	6	*12*	0	0	0	0	*0*	2	0	1	0	*3*
Count Total	0	16	68	80	*164*	0	0	0	0	*0*	11	0	1	11	*23*
Peak Hr	**0**	**8**	**35**	**35**	***78***	**0**	**0**	**0**	**0**	***0***	**7**	**0**	**0**	**8**	***15***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0 Eastbound UT	LT	TH	RT	WINMOORE WAY Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	2	0	1	0	0	6	2	0	2	16	0	29	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	9	2	0	1	8	0	21	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**10**	**0**	**0**	**0**	**9**	**0**	**21**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**10**	**0**	**0**	**2**	**7**	**0**	**21**	92
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**1**	**9**	**0**	**20**	83
5:15 PM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**4**	**1**	**0**	**2**	**5**	**0**	**16**	**78**
5:30 PM	0	0	0	0	0	3	0	1	0	0	6	2	0	0	12	0	24	81
5:45 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	12	72
Count Total	0	0	0	0	0	10	0	6	0	0	61	7	0	8	72	0	164	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**3**	**0**	**0**	**34**	**1**	**0**	**5**	**30**	**0**	**78**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	0 Eastbound LT	TH	RT	WINMOORE WAY Westbound LT	TH	RT	CROWS LANDING RD Northbound LT	TH	RT	CROWS LANDING RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

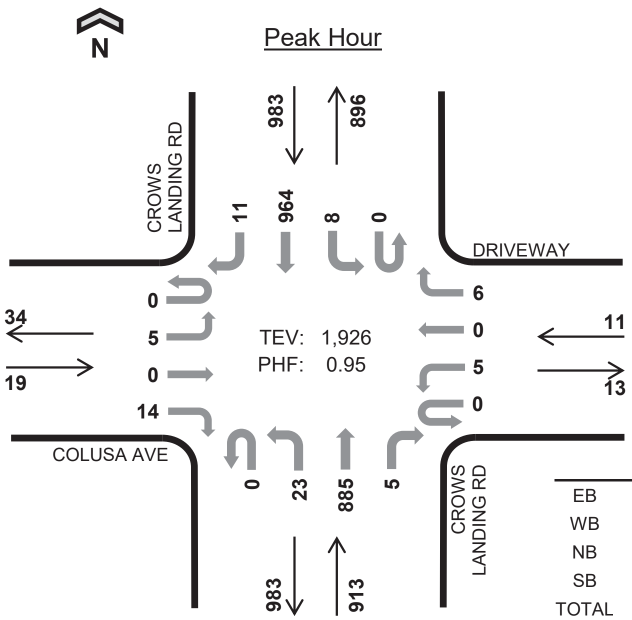
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
COLUSA AVE

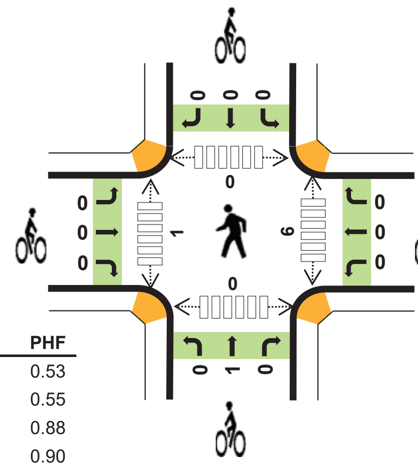
idax

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	0.0%	0.53
WB	27.3%	0.55
NB	6.8%	0.88
SB	4.9%	0.90
TOTAL	5.9%	0.95



Two-Hour Count Summaries

Interval Start		COLUSA AVE Eastbound UT	LT	TH	RT	DRIVEWAY Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	3	0	6	0	1	0	2	0	1	141	1	0	1	167	2	325	0
7:15 AM		0	2	0	4	0	1	0	0	0	2	162	0	0	3	212	0	386	0
7:30 AM		**0**	**0**	**0**	**3**	**0**	**2**	**0**	**3**	**0**	**5**	**199**	**0**	**0**	**3**	**211**	**0**	**426**	0
7:45 AM		**0**	**1**	**0**	**8**	**0**	**1**	**0**	**1**	**0**	**3**	**208**	**1**	**0**	**2**	**272**	**0**	**497**	1,634
8:00 AM		**0**	**1**	**0**	**2**	**0**	**2**	**0**	**1**	**0**	**7**	**228**	**4**	**0**	**0**	**245**	**6**	**496**	1,805
8:15 AM		**0**	**3**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**8**	**250**	**0**	**0**	**3**	**236**	**5**	**507**	**1,926**
8:30 AM		0	1	0	4	0	0	0	1	0	3	192	0	0	0	207	6	414	1,914
8:45 AM		0	2	0	5	0	0	0	2	0	6	212	0	0	0	202	4	433	1,850
Count Total		0	13	0	33	0	7	0	11	0	35	1,592	6	0	12	1,752	23	3,484	0
Peak Hour	**All**	**0**	**5**	**0**	**14**	**0**	**5**	**0**	**6**	**0**	**23**	**885**	**5**	**0**	**8**	**964**	**11**	**1,926**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**59**	**1**	**0**	**1**	**46**	**1**	**113**	**0**
	HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**50%**	**-**	**9%**	**7%**	**20%**	**-**	**13%**	**5%**	**9%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	22	15	*37*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	1	1	18	24	*44*	0	0	1	0	*1*	1	0	0	0	*1*
7:30 AM	**0**	**2**	**18**	**10**	***30***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	*2*
7:45 AM	**0**	**0**	**11**	**9**	***20***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**0**	*3*
8:00 AM	**0**	**0**	**19**	**16**	***35***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**1**	**14**	**13**	***28***	**0**	**0**	**1**	**0**	***1***	**2**	**0**	**0**	**0**	*2*
8:30 AM	0	0	10	10	*20*	0	0	1	0	*1*	3	0	0	0	*3*
8:45 AM	2	1	10	13	*26*	0	0	0	0	*0*	2	3	0	0	*5*
Count Total	3	5	122	110	*240*	0	0	3	0	*3*	12	4	0	1	*17*
Peak Hour	**0**	**3**	**62**	**48**	***113***	**0**	**0**	**1**	**0**	***1***	**6**	**1**	**0**	**0**	*7*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	COLUSA AVE				DRIVEWAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	22	0	0	1	14	0	37	0
7:15 AM	0	0	0	1	0	1	0	0	0	1	17	0	0	3	21	0	44	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**16**	**0**	**0**	**1**	**9**	**0**	**30**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**9**	**0**	**20**	131
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**1**	**0**	**0**	**15**	**1**	**35**	129
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**14**	**0**	**0**	**0**	**13**	**0**	**28**	**113**
8:30 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10	0	20	103
8:45 AM	0	0	0	2	0	0	0	1	0	1	9	0	0	0	13	0	26	109
Count Total	0	0	0	3	0	1	0	4	0	4	117	1	0	5	104	1	240	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**59**	**1**	**0**	**1**	**46**	**1**	**113**	**0**

Two-Hour Count Summaries - Bikes

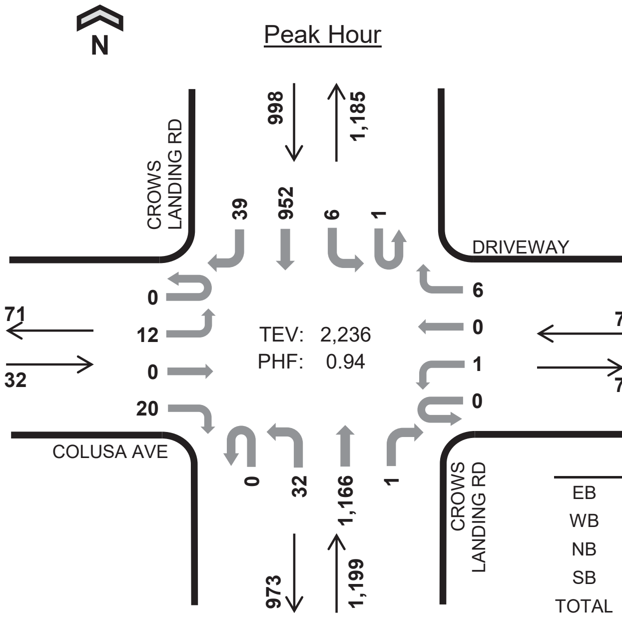
Interval Start	COLUSA AVE			DRIVEWAY			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	0	0	0	3	0	0	0	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

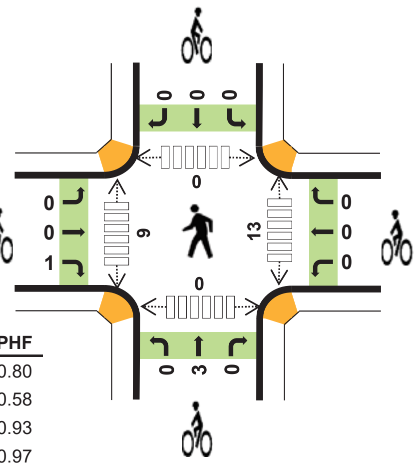
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
COLUSA AVE

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour





	HV %:	PHF
EB	0.0%	0.80
WB	28.6%	0.58
NB	2.6%	0.93
SB	3.4%	0.97
TOTAL	3.0%	0.94

Two-Hour Count Summaries

Interval Start	COLUSA AVE				DRIVEWAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	5	0	4	0	0	0	1	0	7	266	0	0	0	232	7	522	0
4:15 PM	0	2	0	3	0	0	0	4	0	2	248	2	0	2	215	11	489	0
4:30 PM	**0**	**4**	**0**	**6**	**0**	**0**	**0**	**1**	**0**	**10**	**313**	**0**	**1**	**1**	**246**	**10**	**592**	0
4:45 PM	**0**	**3**	**0**	**6**	**0**	**1**	**0**	**2**	**0**	**4**	**290**	**0**	**0**	**1**	**242**	**11**	**560**	2,163
5:00 PM	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**11**	**307**	**0**	**0**	**1**	**239**	**8**	**573**	2,214
5:15 PM	**0**	**3**	**0**	**5**	**0**	**0**	**0**	**1**	**0**	**7**	**256**	**1**	**0**	**3**	**225**	**10**	**511**	**2,236**
5:30 PM	0	6	0	6	0	3	0	0	1	3	284	0	1	2	239	5	550	2,194
5:45 PM	0	2	0	5	0	1	0	0	1	8	235	1	1	1	235	8	498	2,132
Count Total	0	27	0	38	0	5	0	11	2	52	2,199	4	3	11	1,873	70	4,295	0
Peak Hour All	**0**	**12**	**0**	**20**	**0**	**1**	**0**	**6**	**0**	**32**	**1,166**	**1**	**1**	**6**	**952**	**39**	**2,236**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**30**	**1**	**0**	**6**	**28**	**0**	**67**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**33%**	**-**	**0%**	**3%**	**100%**	**0%**	**100%**	**3%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	0	7	15	*24*	0	0	0	0	*0*	4	1	2	0	*7*
4:15 PM	0	2	10	10	*22*	0	0	0	0	*0*	2	0	0	0	*2*
4:30 PM	**0**	**1**	**12**	**9**	***22***	**0**	**0**	**0**	**0**	***0***	**5**	**0**	**0**	**0**	*5*
4:45 PM	**0**	**0**	**6**	**7**	***13***	**1**	**0**	**0**	**0**	***1***	**4**	**0**	**0**	**0**	*4*
5:00 PM	**0**	**1**	**8**	**10**	***19***	**0**	**0**	**3**	**0**	***3***	**2**	**5**	**0**	**0**	*7*
5:15 PM	**0**	**0**	**5**	**8**	***13***	**0**	**0**	**0**	**0**	***0***	**2**	**4**	**0**	**0**	*6*
5:30 PM	0	1	8	12	*21*	0	0	0	0	*0*	3	2	0	0	*5*
5:45 PM	0	0	7	7	*14*	0	0	0	0	*0*	2	1	0	0	*3*
Count Total	2	5	63	78	*148*	1	0	3	0	*4*	24	13	2	0	*39*
Peak Hour	**0**	**2**	**31**	**34**	***67***	**1**	**0**	**3**	**0**	***4***	**13**	**9**	**0**	**0**	***22***

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	COLUSA AVE				DRIVEWAY				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	2	0	0	0	0	0	0	7	0	0	0	15	0	24	0
4:15 PM	0	0	0	0	0	0	0	2	0	0	9	1	0	2	8	0	22	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**12**	**0**	**0**	**1**	**8**	**0**	**22**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**1**	**6**	**0**	**13**	81
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**0**	**0**	**1**	**9**	**0**	**19**	76
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**3**	**5**	**0**	**13**	**67**
5:30 PM	0	0	0	0	0	1	0	0	0	0	8	0	0	1	11	0	21	66
5:45 PM	0	0	0	0	0	0	0	0	0	0	6	1	0	1	6	0	14	67
Count Total	0	0	0	2	0	1	0	4	0	0	60	3	0	10	68	0	148	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**30**	**1**	**0**	**6**	**28**	**0**	**67**	**0**

Two-Hour Count Summaries - Bikes

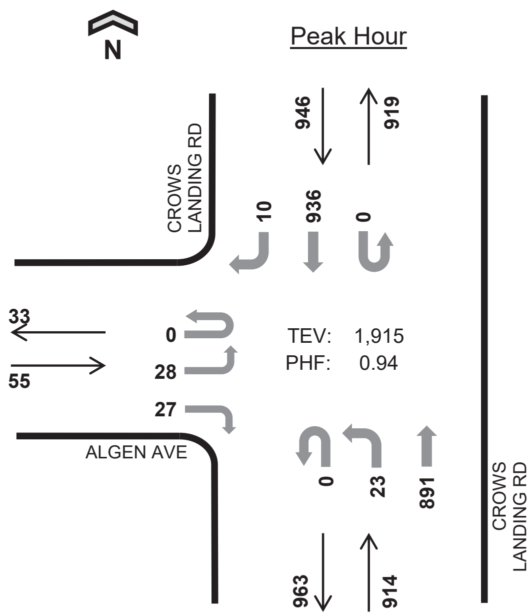
Interval Start	COLUSA AVE			DRIVEWAY			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	4
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	1	0	0	0	0	3	0	0	0	0	4	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**4**	**0**

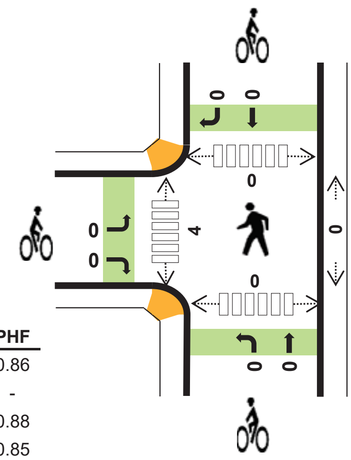
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
ALGEN AVE

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour





	HV %:	PHF
EB	1.8%	0.86
WB	-	-
NB	6.8%	0.88
SB	4.8%	0.85
TOTAL	5.6%	0.94

Two-Hour Count Summaries

Interval Start	ALGEN AVE Eastbound UT	LT	TH	RT	0 Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	5	0	6	0	0	0	0	0	2	120	0	0	0	172	1	306	0
7:15 AM	0	5	0	12	0	0	0	0	0	2	145	0	0	0	213	0	377	0
7:30 AM	**0**	**6**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**5**	**200**	**0**	**0**	**0**	**211**	**1**	**431**	0
7:45 AM	**0**	**6**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**3**	**214**	**0**	**0**	**0**	**275**	**3**	**509**	1,623
8:00 AM	**0**	**10**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**7**	**224**	**0**	**0**	**0**	**226**	**3**	**476**	1,793
8:15 AM	**0**	**6**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**8**	**253**	**0**	**0**	**0**	**224**	**3**	**499**	**1,915**
8:30 AM	0	4	0	6	0	0	0	0	0	4	174	0	0	0	196	7	391	1,875
8:45 AM	0	6	0	4	0	0	0	0	0	3	197	0	0	0	176	2	388	1,754
Count Total	0	48	0	55	0	0	0	0	0	34	1,527	0	0	0	1,693	20	3,377	0
Peak Hour All	**0**	**28**	**0**	**27**	**0**	**0**	**0**	**0**	**0**	**23**	**891**	**0**	**0**	**0**	**936**	**10**	**1,915**	**0**
Peak Hour HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**61**	**0**	**0**	**0**	**45**	**0**	**108**	**0**
Peak Hour HV%	**-**	**4%**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**4%**	**7%**	**-**	**-**	**-**	**5%**	**0%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	18	12	*30*	1	0	0	0	*1*	0	0	0	0	*0*
7:15 AM	0	0	15	24	*39*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	**0**	**0**	**18**	**9**	***27***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**11**	**10**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**1**	**0**	**19**	**14**	***34***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
8:15 AM	**0**	**0**	**14**	**12**	***26***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	8	12	*20*	0	0	0	0	*0*	0	4	0	0	*4*
8:45 AM	0	0	8	11	*19*	0	0	0	1	*1*	0	1	0	0	*1*
Count Total	1	0	111	104	*216*	1	0	0	1	*2*	0	9	0	0	*9*
Peak Hr	**1**	**0**	**62**	**45**	***108***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	***4***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	ALGEN AVE				0				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	12	0	30	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	15	0	0	0	24	0	39	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**0**	**9**	**0**	**27**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**10**	**0**	**21**	117
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**18**	**0**	**0**	**0**	**14**	**0**	**34**	121
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**12**	**0**	**26**	**108**
8:30 AM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	12	0	20	101
8:45 AM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	11	0	19	99
Count Total	0	1	0	0	0	0	0	0	0	1	110	0	0	0	104	0	216	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**61**	**0**	**0**	**0**	**45**	**0**	**108**	**0**

Two-Hour Count Summaries - Bikes

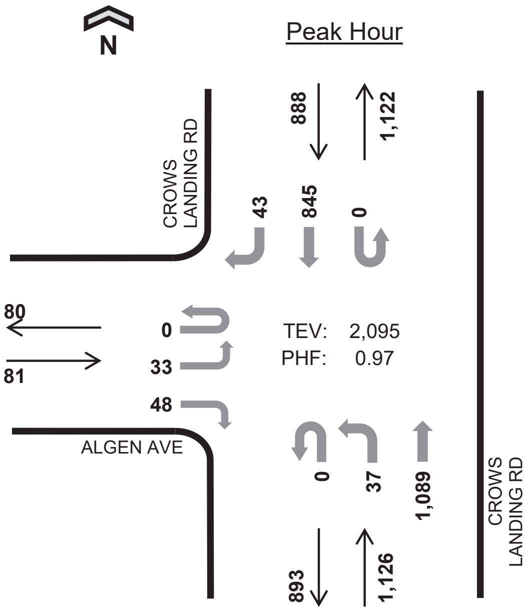
Interval Start	ALGEN AVE			0			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Count Total	1	0	0	0	0	0	0	0	0	0	0	1	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

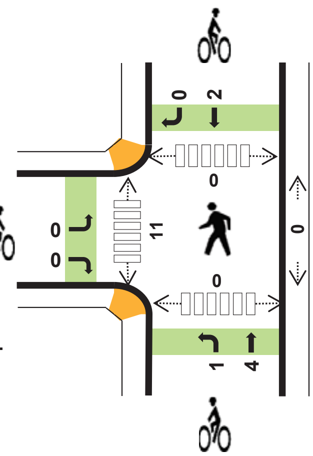
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
ALGEN AVE

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour





	HV %:	PHF
EB	2.5%	0.81
WB	-	-
NB	2.5%	0.92
SB	3.0%	0.94
TOTAL	2.7%	0.97

Two-Hour Count Summaries

Interval Start	ALGEN AVE Eastbound UT	LT	TH	RT	0 Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	6	0	6	0	0	0	0	0	13	252	0	0	0	199	7	483	0
4:15 PM	0	5	0	10	0	0	0	0	0	7	256	0	0	0	204	10	492	0
4:30 PM	0	10	0	10	0	0	0	0	0	7	291	0	0	0	199	9	526	0
4:45 PM	**0**	**10**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**9**	**264**	**0**	**0**	**0**	**212**	**12**	**522**	2,023
5:00 PM	**0**	**6**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**11**	**295**	**0**	**0**	**0**	**206**	**12**	**542**	2,082
5:15 PM	**0**	**10**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**13**	**259**	**0**	**0**	**0**	**202**	**7**	**502**	2,092
5:30 PM	**0**	**7**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**4**	**271**	**0**	**0**	**0**	**225**	**12**	**529**	**2,095**
5:45 PM	0	3	0	8	0	0	0	0	0	5	225	0	0	0	210	9	460	2,033
Count Total	0	57	0	82	0	0	0	0	0	69	2,113	0	0	0	1,657	78	4,056	0
Peak Hour All	**0**	**33**	**0**	**48**	**0**	**0**	**0**	**0**	**0**	**37**	**1,089**	**0**	**0**	**0**	**845**	**43**	**2,095**	**0**
Peak Hour HV	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**0**	**26**	**1**	**57**	**0**
Peak Hour HV%	**-**	**3%**	**-**	**2%**	**-**	**-**	**-**	**-**	**-**	**0%**	**3%**	**-**	**-**	**-**	**3%**	**2%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	9	12	*21*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	2	0	11	8	*21*	0	0	0	1	*1*	0	3	0	0	*3*
4:30 PM	0	0	13	8	*21*	0	0	0	0	*0*	0	4	0	0	*4*
4:45 PM	**2**	**0**	**6**	**3**	***11***	**0**	**0**	**1**	**1**	***2***	**0**	**8**	**0**	**0**	*8*
5:00 PM	**0**	**0**	**9**	**7**	***16***	**0**	**0**	**3**	**1**	***4***	**0**	**1**	**0**	**0**	*1*
5:15 PM	**0**	**0**	**5**	**3**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:30 PM	**0**	**0**	**8**	**14**	***22***	**0**	**0**	**1**	**0**	***1***	**0**	**1**	**0**	**0**	*1*
5:45 PM	0	0	7	6	*13*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	4	0	68	61	*133*	0	0	5	3	*8*	0	18	0	0	*18*
Peak Hr	**2**	**0**	**28**	**27**	***57***	**0**	**0**	**5**	**2**	***7***	**0**	**11**	**0**	**0**	*11*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	ALGEN AVE Eastbound UT	LT	TH	RT	0 Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	12	0	21	0
4:15 PM	0	0	0	2	0	0	0	0	0	0	11	0	0	0	8	0	21	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	13	0	0	0	7	1	21	0
4:45 PM	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**3**	**0**	**11**	74
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**6**	**1**	**16**	69
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**3**	**0**	**8**	56
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**14**	**0**	**22**	**57**
5:45 PM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	6	0	13	59
Count Total	0	1	0	3	0	0	0	0	0	0	68	0	0	0	59	2	133	0
Peak Hour	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**0**	**26**	**1**	**57**	**0**

Two-Hour Count Summaries - Bikes

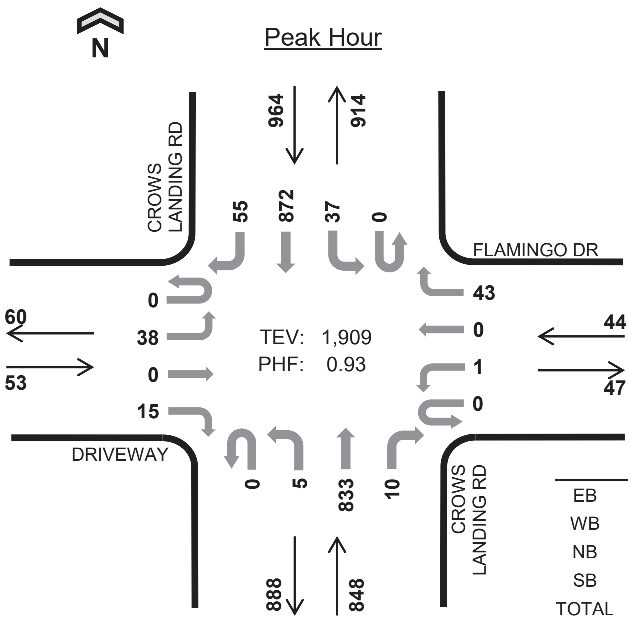
Interval Start	ALGEN AVE Eastbound LT	TH	RT	0 Westbound LT	TH	RT	CROWS LANDING RD Northbound LT	TH	RT	CROWS LANDING RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**2**	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**4**	7
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	6
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**7**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Count Total	0	0	0	0	0	0	1	4	0	0	3	0	8	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**2**	**0**	**7**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

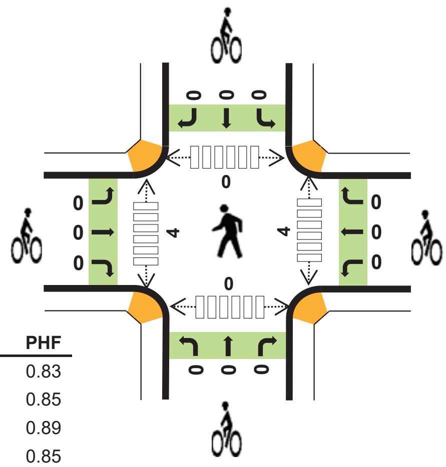
CROWS LANDING RD
FLAMINGO DR

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	0.0%	0.83
WB	18.2%	0.85
NB	6.5%	0.89
SB	4.6%	0.85
TOTAL	5.6%	0.93



Two-Hour Count Summaries

Interval Start	DRIVEWAY Eastbound UT	LT	TH	RT	FLAMINGO DR Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	5	0	4	0	0	0	7	0	1	103	4	1	2	163	8	298	0
7:15 AM	0	6	0	3	0	0	0	2	0	0	144	0	0	13	192	13	373	0
7:30 AM	**0**	**11**	**0**	**1**	**0**	**0**	**0**	**7**	**0**	**1**	**191**	**1**	**0**	**9**	**196**	**16**	**433**	0
7:45 AM	**0**	**9**	**0**	**5**	**0**	**1**	**0**	**12**	**0**	**1**	**197**	**5**	**0**	**8**	**267**	**10**	**515**	1,619
8:00 AM	**0**	**8**	**0**	**8**	**0**	**0**	**0**	**11**	**0**	**2**	**211**	**2**	**0**	**9**	**209**	**13**	**473**	1,794
8:15 AM	**0**	**10**	**0**	**1**	**0**	**0**	**0**	**13**	**0**	**1**	**234**	**2**	**0**	**11**	**200**	**16**	**488**	**1,909**
8:30 AM	0	10	0	2	0	0	0	12	0	3	164	6	0	8	180	13	398	1,874
8:45 AM	0	10	0	7	0	2	0	7	0	1	184	5	0	6	160	11	393	1,752
Count Total	0	69	0	31	0	3	0	71	0	10	1,428	25	1	66	1,567	100	3,371	0
Peak Hour All	**0**	**38**	**0**	**15**	**0**	**1**	**0**	**43**	**0**	**5**	**833**	**10**	**0**	**37**	**872**	**55**	**1,909**	**0**
HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**53**	**2**	**0**	**11**	**33**	**0**	**107**	**0**
HV%	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**19%**	**-**	**0%**	**6%**	**20%**	**-**	**30%**	**4%**	**0%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	4	17	13	*34*	0	0	0	0	*0*	1	0	0	0	*1*
7:15 AM	0	1	14	23	*38*	0	0	0	0	*0*	1	0	0	0	*1*
7:30 AM	**0**	**2**	**16**	**9**	***27***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
7:45 AM	**0**	**0**	**13**	**10**	***23***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:00 AM	**0**	**2**	**15**	**13**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	*3*
8:15 AM	**0**	**4**	**11**	**12**	***27***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**0**	*3*
8:30 AM	0	4	7	12	*23*	0	0	0	0	*0*	0	3	0	0	*3*
8:45 AM	0	1	7	10	*18*	0	0	0	0	*0*	2	1	0	0	*3*
Count Total	0	18	100	102	*220*	0	0	0	0	*0*	8	8	0	0	*16*
Peak Hour	**0**	**8**	**55**	**44**	***107***	**0**	**0**	**0**	**0**	***0***	**4**	**4**	**0**	**0**	*8*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	DRIVEWAY				FLAMINGO DR				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	4	0	0	14	3	0	1	12	0	34	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	14	0	0	2	21	0	38	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**15**	**1**	**0**	**1**	**8**	**0**	**27**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**1**	**0**	**2**	**8**	**0**	**23**	122
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**15**	**0**	**0**	**4**	**9**	**0**	**30**	118
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**11**	**0**	**0**	**4**	**8**	**0**	**27**	**107**
8:30 AM	0	0	0	0	0	0	0	4	0	0	5	2	0	1	11	0	23	103
8:45 AM	0	0	0	0	0	1	0	0	0	0	6	1	0	1	8	1	18	98
Count Total	0	0	0	0	0	1	0	17	0	0	92	8	0	16	85	1	220	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**53**	**2**	**0**	**11**	**33**	**0**	**107**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	DRIVEWAY			FLAMINGO DR			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

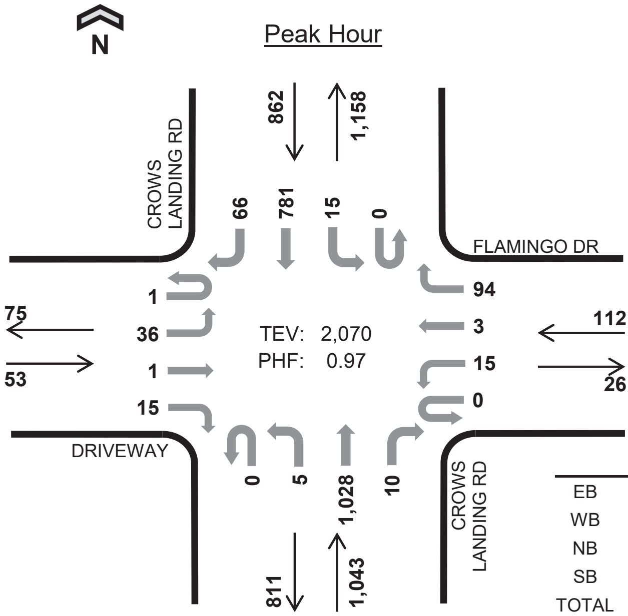
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
FLAMINGO DR

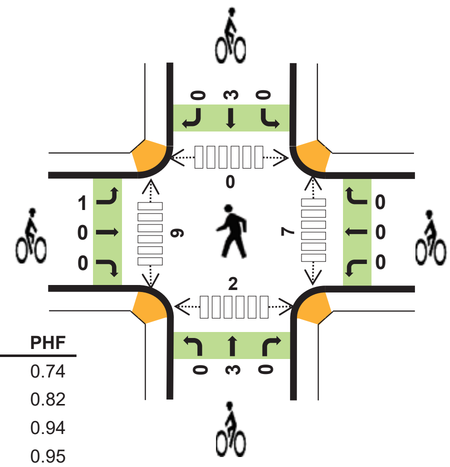
idax

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.74
WB	0.9%	0.82
NB	3.5%	0.94
SB	3.2%	0.95
TOTAL	3.2%	0.97



Two-Hour Count Summaries

Interval Start		DRIVEWAY				FLAMINGO DR				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	7	0	5	0	1	0	27	0	1	240	7	0	6	179	11	484	0
4:15 PM		**0**	**7**	**0**	**2**	**0**	**6**	**0**	**19**	**0**	**0**	**244**	**1**	**0**	**6**	**189**	**20**	**494**	0
4:30 PM		**0**	**10**	**0**	**8**	**0**	**4**	**1**	**29**	**0**	**1**	**275**	**2**	**0**	**3**	**187**	**15**	**535**	0
4:45 PM		**0**	**10**	**1**	**1**	**0**	**4**	**1**	**18**	**0**	**3**	**237**	**4**	**0**	**4**	**210**	**12**	**505**	2,018
5:00 PM		**1**	**9**	**0**	**4**	**0**	**1**	**1**	**28**	**0**	**1**	**272**	**3**	**0**	**2**	**195**	**19**	**536**	**2,070**
5:15 PM		0	8	0	7	0	0	1	11	0	5	245	1	0	2	196	17	493	2,069
5:30 PM		0	10	0	4	0	1	0	10	0	6	264	1	0	4	216	15	531	2,065
5:45 PM		0	12	0	10	0	5	0	20	0	4	202	0	0	5	185	20	463	2,023
Count Total		1	73	1	41	0	22	4	162	0	21	1,979	19	0	32	1,557	129	4,041	0
Peak Hour	**All**	**1**	**36**	**1**	**15**	**0**	**15**	**3**	**94**	**0**	**5**	**1,028**	**10**	**0**	**15**	**781**	**66**	**2,070**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**36**	**1**	**0**	**4**	**24**	**0**	**66**	**0**
	HV%	**0%**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**1%**	**-**	**0%**	**4%**	**10%**	**-**	**27%**	**3%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	8	11	*19*	0	0	0	0	*0*	2	0	0	1	*3*
4:15 PM	**0**	**0**	**12**	**11**	***23***	**0**	**0**	**0**	**0**	***0***	**2**	**3**	**0**	**1**	*6*
4:30 PM	**0**	**1**	**11**	**5**	***17***	**0**	**0**	**0**	**1**	***1***	**0**	**3**	**0**	**0**	*3*
4:45 PM	**0**	**0**	**6**	**5**	***11***	**1**	**0**	**0**	**1**	***2***	**3**	**1**	**0**	**1**	*5*
5:00 PM	**0**	**0**	**8**	**7**	***15***	**0**	**0**	**3**	**1**	***4***	**2**	**2**	**0**	**0**	*4*
5:15 PM	0	0	6	2	*8*	0	0	0	0	*0*	2	1	0	1	*4*
5:30 PM	0	0	11	14	*25*	0	1	0	0	*1*	1	2	0	0	*3*
5:45 PM	1	1	7	6	*15*	0	0	0	0	*0*	1	0	0	0	*1*
Count Total	1	2	69	61	*133*	1	1	3	3	*8*	13	12	0	4	*29*
Peak Hour	**0**	**1**	**37**	**28**	***66***	**1**	**0**	**3**	**3**	***7***	**7**	**9**	**0**	**2**	***18***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	DRIVEWAY Eastbound UT	LT	TH	RT	FLAMINGO DR Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	2	9	0	19	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**2**	**9**	**0**	**23**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**11**	**0**	**0**	**1**	**4**	**0**	**17**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**4**	**0**	**11**	70
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**7**	**0**	**15**	**66**
5:15 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	8	51
5:30 PM	0	0	0	0	0	0	0	0	0	1	10	0	0	1	13	0	25	59
5:45 PM	0	0	0	1	0	0	0	1	0	1	6	0	0	0	6	0	15	63
Count Total	0	0	0	1	0	0	0	2	0	2	66	1	0	7	54	0	133	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**36**	**1**	**0**	**4**	**24**	**0**	**66**	**0**

Two-Hour Count Summaries - Bikes

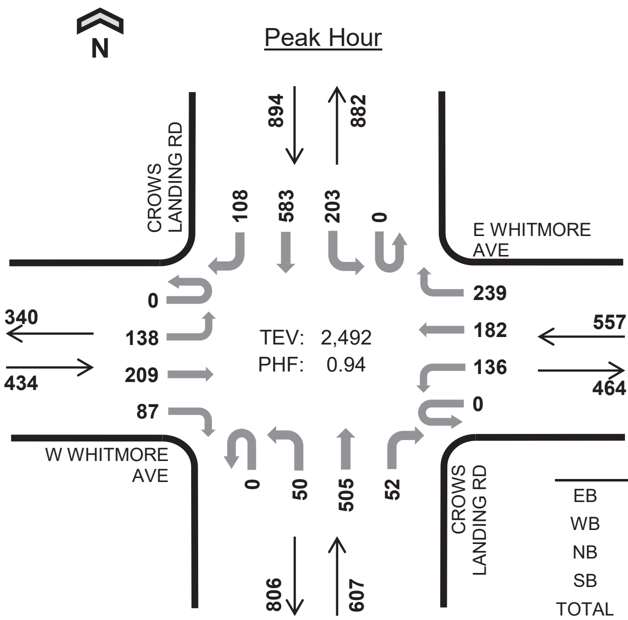
Interval Start	DRIVEWAY Eastbound LT	TH	RT	FLAMINGO DR Westbound LT	TH	RT	CROWS LANDING RD Northbound LT	TH	RT	CROWS LANDING RD Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	0
4:45 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**4**	**7**
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	7
5:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	7
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Count Total	1	0	0	0	0	1	0	3	0	0	3	0	8	0
Peak Hour	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**	**0**	**7**	**0**

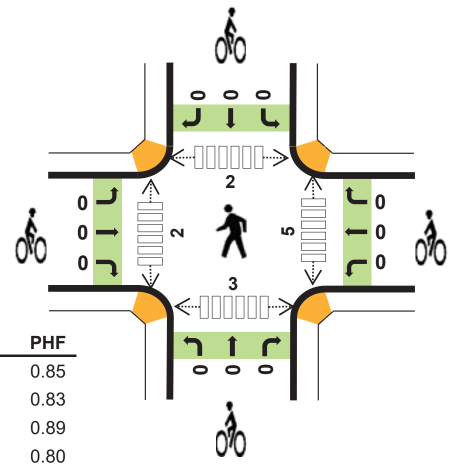
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

CROWS LANDING RD
W WHITMORE AVE

Date: 11-09-2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour





	HV %:	PHF
EB	2.5%	0.85
WB	5.6%	0.83
NB	7.1%	0.89
SB	3.8%	0.80
TOTAL	4.8%	0.94

Two-Hour Count Summaries

Interval Start		W WHITMORE AVE Eastbound UT	LT	TH	RT	E WHITMORE AVE Westbound UT	LT	TH	RT	CROWS LANDING RD Northbound UT	LT	TH	RT	CROWS LANDING RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	24	39	14	0	19	32	21	0	6	63	9	0	42	112	14	395	0
7:15 AM		0	22	78	26	0	33	32	29	0	12	93	14	0	42	152	13	546	0
7:30 AM		**0**	**35**	**68**	**24**	**0**	**34**	**32**	**51**	**0**	**12**	**121**	**16**	**0**	**48**	**135**	**16**	**592**	0
7:45 AM		**0**	**33**	**45**	**13**	**0**	**45**	**56**	**66**	**0**	**6**	**113**	**9**	**0**	**69**	**185**	**25**	**665**	2,198
8:00 AM		**0**	**24**	**45**	**28**	**0**	**30**	**45**	**59**	**0**	**17**	**132**	**11**	**0**	**50**	**129**	**34**	**604**	2,407
8:15 AM		**0**	**46**	**51**	**22**	**0**	**27**	**49**	**63**	**0**	**15**	**139**	**16**	**0**	**36**	**134**	**33**	**631**	**2,492**
8:30 AM		0	30	49	17	0	17	37	31	0	20	139	19	0	58	123	18	558	2,458
8:45 AM		0	32	43	15	0	22	40	57	0	10	103	15	0	35	127	16	515	2,308
Count Total		0	246	418	159	0	227	323	377	0	98	903	109	0	380	1,097	169	4,506	0
Peak Hour	**All**	**0**	**138**	**209**	**87**	**0**	**136**	**182**	**239**	**0**	**50**	**505**	**52**	**0**	**203**	**583**	**108**	**2,492**	**0**
	HV	**0**	**6**	**5**	**0**	**0**	**10**	**8**	**13**	**0**	**2**	**37**	**4**	**0**	**8**	**24**	**2**	**119**	**0**
	HV%	**-**	**4%**	**2%**	**0%**	**-**	**7%**	**4%**	**5%**	**-**	**4%**	**7%**	**8%**	**-**	**4%**	**4%**	**2%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	2	5	14	13	*34*	0	0	0	0	*0*	1	0	0	0	*1*
7:15 AM	2	6	14	22	*44*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	**3**	**8**	**14**	**7**	***32***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
7:45 AM	**2**	**10**	**9**	**10**	***31***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:00 AM	**2**	**7**	**13**	**8**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:15 AM	**4**	**6**	**7**	**9**	***26***	**0**	**0**	**0**	**0**	***0***	**3**	**2**	**2**	**2**	***9***
8:30 AM	2	5	8	12	*27*	0	0	0	0	*0*	1	2	2	0	*5*
8:45 AM	1	8	6	9	*24*	0	0	0	0	*0*	3	0	1	0	*4*
Count Total	18	55	85	90	*248*	0	0	0	0	*0*	10	4	6	3	*23*
Peak Hour	**11**	**31**	**43**	**34**	***119***	**0**	**0**	**0**	**0**	***0***	**5**	**2**	**2**	**3**	***12***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	W WHITMORE AVE				E WHITMORE AVE				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	2	0	0	0	1	1	3	0	1	11	2	0	4	8	1	34	0
7:15 AM	0	0	2	0	0	4	0	2	0	1	12	1	0	4	15	3	44	0
7:30 AM	**0**	**2**	**1**	**0**	**0**	**3**	**2**	**3**	**0**	**1**	**13**	**0**	**0**	**4**	**3**	**0**	**32**	0
7:45 AM	**0**	**1**	**1**	**0**	**0**	**3**	**3**	**4**	**0**	**0**	**8**	**1**	**0**	**0**	**9**	**1**	**31**	141
8:00 AM	**0**	**1**	**1**	**0**	**0**	**3**	**2**	**2**	**0**	**1**	**10**	**2**	**0**	**1**	**6**	**1**	**30**	137
8:15 AM	**0**	**2**	**2**	**0**	**0**	**1**	**1**	**4**	**0**	**0**	**6**	**1**	**0**	**3**	**6**	**0**	**26**	**119**
8:30 AM	0	0	2	0	0	2	2	1	0	1	4	3	0	5	6	1	27	114
8:45 AM	0	0	1	0	0	4	2	2	0	0	5	1	0	0	9	0	24	107
Count Total	0	8	10	0	0	21	13	21	0	5	69	11	0	21	62	7	248	0
Peak Hour	**0**	**6**	**5**	**0**	**0**	**10**	**8**	**13**	**0**	**2**	**37**	**4**	**0**	**8**	**24**	**2**	**119**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	W WHITMORE AVE			E WHITMORE AVE			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

www.idaxdata.com

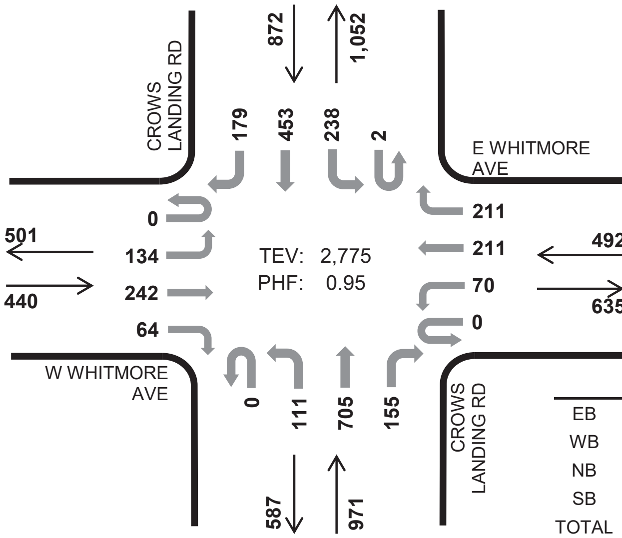
CROWS LANDING RD
W WHITMORE AVE

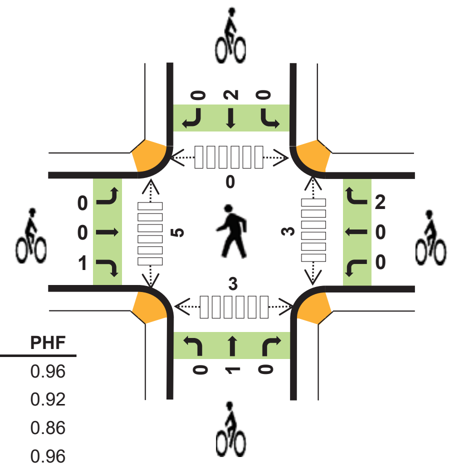
idax

Date: 11-09-2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

N

Peak Hour





	HV %:	PHF
EB	2.3%	0.96
WB	2.0%	0.92
NB	3.0%	0.86
SB	2.9%	0.96
TOTAL	2.7%	0.95

Two-Hour Count Summaries

Interval Start	W WHITMORE AVE				E WHITMORE AVE				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	28	61	16	0	12	53	41	0	30	183	27	0	62	87	34	634	0
4:15 PM	0	20	59	25	0	9	49	59	0	19	164	19	1	58	99	45	626	0
4:30 PM	0	37	73	12	0	16	48	41	0	25	208	41	1	66	109	41	718	0
4:45 PM	**0**	**32**	**70**	**13**	**0**	**17**	**54**	**53**	**0**	**35**	**160**	**40**	**0**	**62**	**126**	**38**	**700**	2,678
5:00 PM	**0**	**32**	**55**	**16**	**0**	**12**	**53**	**37**	**0**	**22**	**213**	**46**	**1**	**62**	**109**	**42**	**700**	2,744
5:15 PM	**0**	**33**	**59**	**17**	**0**	**17**	**52**	**64**	**0**	**25**	**148**	**27**	**0**	**52**	**114**	**39**	**647**	2,765
5:30 PM	**0**	**37**	**58**	**18**	**0**	**24**	**52**	**57**	**0**	**29**	**184**	**42**	**1**	**62**	**104**	**60**	**728**	**2,775**
5:45 PM	0	23	52	15	1	6	54	45	0	21	153	28	0	64	110	52	624	2,699
Count Total	0	242	487	132	1	113	415	397	0	206	1,413	270	4	488	858	351	5,377	0
Peak Hour All	**0**	**134**	**242**	**64**	**0**	**70**	**211**	**211**	**0**	**111**	**705**	**155**	**2**	**238**	**453**	**179**	**2,775**	**0**
Peak Hour HV	**0**	**2**	**8**	**0**	**0**	**1**	**1**	**8**	**0**	**4**	**21**	**4**	**0**	**2**	**21**	**2**	**74**	**0**
Peak Hour HV%	**-**	**1%**	**3%**	**0%**	**-**	**1%**	**0%**	**4%**	**-**	**4%**	**3%**	**3%**	**0%**	**1%**	**5%**	**1%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	2	7	9	*23*	0	0	0	0	*0*	5	0	1	2	*8*
4:15 PM	3	5	10	9	*27*	0	0	0	0	*0*	0	0	2	1	*3*
4:30 PM	1	4	13	4	*22*	0	0	0	0	*0*	0	1	0	3	*4*
4:45 PM	**4**	**2**	**7**	**4**	***17***	**1**	**0**	**0**	**1**	***2***	**1**	**1**	**0**	**0**	***2***
5:00 PM	**2**	**2**	**7**	**7**	***18***	**0**	**2**	**1**	**1**	***4***	**0**	**2**	**0**	**2**	***4***
5:15 PM	**2**	**2**	**7**	**5**	***16***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**0**	**0**	***3***
5:30 PM	**2**	**4**	**8**	**9**	***23***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**1**	***2***
5:45 PM	2	3	6	7	*18*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	21	24	65	54	*164*	1	2	1	2	*6*	8	6	3	9	*26*
Peak Hour	**10**	**10**	**29**	**25**	***74***	**1**	**2**	**1**	**2**	***6***	**3**	**5**	**0**	**3**	***11***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	W WHITMORE AVE				E WHITMORE AVE				CROWS LANDING RD				CROWS LANDING RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	3	0	0	1	0	1	0	1	5	1	0	2	6	1	23	0
4:15 PM	0	1	2	0	0	1	1	3	0	1	8	1	0	2	6	1	27	0
4:30 PM	0	1	0	0	0	1	1	2	0	1	8	4	0	3	1	0	22	0
4:45 PM	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**6**	**0**	**0**	**1**	**3**	**0**	**17**	89
5:00 PM	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**5**	**1**	**0**	**1**	**5**	**1**	**18**	84
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**4**	**2**	**0**	**0**	**4**	**1**	**16**	73
5:30 PM	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**3**	**0**	**1**	**6**	**1**	**0**	**0**	**9**	**0**	**23**	**74**
5:45 PM	0	0	1	1	0	0	0	3	0	1	3	2	0	1	5	1	18	75
Count Total	0	6	14	1	0	4	3	17	0	8	45	12	0	10	39	5	164	0
Peak Hour	**0**	**2**	**8**	**0**	**0**	**1**	**1**	**8**	**0**	**4**	**21**	**4**	**0**	**2**	**21**	**2**	**74**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	W WHITMORE AVE			E WHITMORE AVE			CROWS LANDING RD			CROWS LANDING RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	2
5:00 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**1**	**0**	**4**	6
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	6
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	1	0	0	2	0	1	0	0	2	0	6	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**2**	**0**	**6**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Turning Movement Count

NB / SB Street:	Crows Landing Rd	WB / EB Street	Amador Ave	Date:	7/20/2017

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Bikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
7:00	0	0	8	169	0	0	0	0	0	0	0	0	0	0	0	137	0	0	0	0	5	0	9	0
7:15	0	0	3	232	0	0	0	0	0	0	0	0	0	0	0	149	1	0	0	0	3	0	9	0
7:30	0	6	4	254	0	0	0	0	0	0	0	0	0	0	0	201	1	0	0	1	4	0	10	0
7:45	0	0	10	210	0	0	0	0	0	0	0	0	0	0	0	155	0	0	0	1	2	0	6	0
8:00	0	0	2	217	0	0	0	0	0	0	0	0	0	0	0	176	1	0	0	2	8	0	10	0
8:15	0	4	12	221	0	0	0	0	0	0	0	0	0	0	0	167	2	0	1	0	0	0	5	0
8:30	0	1	5	175	0	0	0	0	0	0	0	0	0	0	0	182	0	0	0	0	2	0	5	0
8:45	0	1	4	199	0	0	0	0	0	0	0	0	0	1	0	155	0	0	0	2	4	0	7	0

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Biikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
16:00	3	0	25	225	0	0	0	0	0	0	0	0	0	0	0	309	3	0	0	0	4	0	14	3
16:15	2	1	13	215	0	0	0	0	0	0	0	0	0	0	0	253	5	0	2	0	4	0	9	0
16:30	0	5	23	286	0	0	0	0	0	0	0	0	0	0	0	373	6	0	0	2	2	4	13	0
16:45	0	2	11	217	1	0	0	0	0	0	0	0	0	0	1	311	8	0	0	0	2	0	15	0
17:00	0	3	14	243	0	0	0	0	0	0	0	0	0	0	0	338	6	0	0	0	2	0	8	0
17:15	0	2	14	236	2	0	0	0	0	0	0	0	0	0	0	279	8	0	0	3	5	0	10	0
17:30	0	0	21	242	3	0	0	0	0	0	0	0	0	0	0	327	1	0	0	1	6	0	10	1
17:45	0	1	17	201	1	0	0	0	0	0	0	0	0	0	0	252	4	0	0	3	6	0	12	0

Turning Movement Count

NB / SB Street:	Crows Landing Rd	WB / EB Street	Glenn Ave	Date:	7/25/2017

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Bikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
7:00	0	0	3	158	1	0	0	0	0	0	0	0	0	0	0	118	4	0	0	1	2	0	2	0
7:15	0	0	4	205	4	0	0	0	0	0	0	0	1	0	1	150	3	0	0	2	6	5	3	0
7:30	0	0	2	243	1	0	0	0	0	0	0	0	0	0	2	179	4	0	0	0	2	2	3	0
7:45	0	0	5	207	2	0	0	0	0	0	0	0	0	0	3	147	7	0	0	0	3	0	4	0
8:00	0	0	2	194	6	0	0	0	0	0	0	0	0	0	1	169	4	0	0	0	1	0	3	0
8:15	0	0	7	184	7	0	0	0	0	0	0	0	0	0	1	157	4	0	0	1	6	0	6	0
8:30	0	0	1	155	2	0	0	0	0	0	0	0	0	0	1	173	5	0	0	0	4	4	9	0
8:45	0	0	5	181	1	0	0	0	0	0	0	0	0	0	1	160	10	0	0	0	6	1	4	0

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Biikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
16:00	0	0	5	222	3	0	0	0	3	0	1	0	0	1	1	268	11	0	0	2	13	0	4	0
16:15	1	0	3	225	6	0	0	0	3	0	4	0	1	1	3	248	11	0	0	0	8	0	3	0
16:30	2	1	7	215	4	0	2	0	7	0	2	0	1	0	2	257	6	0	1	2	9	0	6	0
16:45	0	0	7	207	1	0	0	2	2	0	4	0	1	0	3	234	6	0	0	0	6	0	8	0
17:00	0	1	10	199	4	0	0	0	5	0	5	0	0	0	5	270	5	0	0	1	4	0	10	0
17:15	0	1	8	213	1	2	0	0	4	0	1	0	1	1	6	242	6	0	0	0	6	0	12	0
17:30	1	1	6	224	1	0	0	0	1	0	1	0	3	0	2	290	8	0	0	0	8	0	9	1
17:45	0	5	9	201	3	0	0	0	3	0	3	0	0	0	3	201	11	0	0	0	12	0	4	0

Turning Movement Count

NB / SB Street:	Crows Landing Rd	WB / EB Street	Imperial Ave	Date:	8/2/2017

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Bikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
7:00	0	0	7	159	0	0	0	0	0	0	0	0	0	0	0	121	8	0	0	0	7	0	13	0
7:15	0	1	7	217	0	0	0	0	0	0	0	0	0	0	0	160	6	0	0	0	8	0	4	0
7:30	0	0	2	236	0	0	0	0	0	0	0	0	0	0	0	174	6	0	0	0	8	0	3	0
7:45	0	2	4	213	0	0	0	0	0	0	0	0	0	0	0	151	5	0	0	0	6	0	4	0
8:00	0	2	8	178	0	0	0	0	0	0	0	0	0	0	0	166	3	0	0	0	5	0	6	0
8:15	0	0	3	163	0	0	0	0	0	0	0	0	0	0	0	166	4	0	0	0	4	0	1	0
8:30	0	0	9	178	0	0	0	0	0	0	0	0	0	0	0	188	6	0	0	0	7	0	2	0
8:45	0	0	6	161	0	0	0	0	0	0	0	0	0	0	0	172	2	0	0	0	8	0	2	0

Time	SB Bikes	SB Peds	SB Right	SB Thru	SB Left	SB U trn	WB Bikes	WB Peds	WB Right	WB Thru	WB Left	WB U Trns	NB Biikes	NB Peds	NB Right	NB Thru	NB Left	NB UTrn	EB Bikes	EB Peds	EB Right	EB Thru	EB Left	EB U Trn
16:00	0	0	17	134	0	0	0	0	0	0	0	0	0	0	0	254	0	0	0	1	7	0	13	0
16:15	1	1	19	288	0	0	0	0	0	0	0	0	1	0	0	244	0	0	0	2	9	0	16	0
16:30	0	2	26	232	0	0	0	0	0	0	0	0	2	0	0	263	0	0	0	0	13	0	17	0
16:45	1	2	7	216	0	0	0	0	0	0	0	0	1	0	0	305	0	0	0	1	6	0	7	0
17:00	0	3	18	240	0	0	0	0	0	0	0	0	0	0	0	231	0	0	0	0	7	0	20	0
17:15	0	1	25	235	0	0	0	0	0	0	0	0	1	0	0	244	0	0	0	7	6	0	16	0
17:30	2	1	23	184	0	0	0	0	0	0	0	0	0	0	0	295	0	0	0	0	0	0	0	0
17:45	2	1	42	223	0	0	0	0	0	0	0	0	0	0	0	196	0	0	0	0	0	0	0	0

Vehicle Classification Report Summary

IDAX DATA SOLUTIONS

Location: Crows Landing Rd N/O Olivero Rd

Count Direction: Northbound / Southbound

Date Range: 11/9/2017 to 11/9/2017

Site Code: 01

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
	Study Total													
Northbound	257	10,132	3,332	20	644	387	0	14	206	127	7	4	176	15,306
Percent	1.7%	66.2%	21.8%	0.1%	4.2%	2.5%	0.0%	0.1%	1.3%	0.8%	0.0%	0.0%	1.1%	100%
Southbound	123	10,318	3,140	18	547	179	0	59	178	109	5	2	119	14,797
Percent	0.8%	69.7%	21.2%	0.1%	3.7%	1.2%	0.0%	0.4%	1.2%	0.7%	0.0%	0.0%	0.8%	100%
Total	380	20,450	6,472	38	1,191	566	0	73	384	236	12	6	295	30,103
Percent	1.3%	67.9%	21.5%	0.1%	4.0%	1.9%	0.0%	0.2%	1.3%	0.8%	0.0%	0.0%	1.0%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Location: Crows Landing Rd N/O Olivero Rd
Date Range: 11/9/2017 to 11/9/2017
Site Code: 01

Thursday, November 9, 2017
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	2	37	9	1	2	0	0	0	8	0	0	0	1	**60**
2:00 AM	3	58	13	2	7	2	0	0	11	0	0	0	0	**96**
3:00 AM	5	136	31	2	6	5	0	0	5	1	1	0	0	**192**
4:00 AM	1	131	42	1	13	1	0	1	7	0	1	0	0	**198**
5:00 AM	7	202	89	1	19	5	0	0	14	0	0	0	1	**338**
6:00 AM	3	347	133	1	44	10	0	2	10	3	0	0	5	**558**
7:00 AM	8	601	187	3	41	15	0	2	9	4	0	0	7	**877**
8:00 AM	8	640	219	1	37	18	0	3	7	18	0	0	10	**961**
9:00 AM	10	496	218	2	44	16	0	1	13	4	0	0	5	**809**
10:00 AM	3	573	189	1	52	10	0	9	4	6	0	0	6	**853**
11:00 AM	1	615	189	1	30	13	0	2	9	5	1	0	11	**877**
12:00 PM	7	695	199	0	45	16	0	2	7	12	0	0	9	**992**
1:00 PM	11	724	198	0	32	11	0	6	11	9	0	0	12	**1,014**
2:00 PM	5	769	194	0	24	11	0	10	7	7	1	1	10	**1,039**
3:00 PM	7	688	210	0	32	12	0	6	4	8	0	0	11	**978**
4:00 PM	11	679	258	2	31	9	0	3	5	9	0	0	9	**1,016**
5:00 PM	10	702	222	0	26	3	0	4	2	8	0	0	2	**979**
6:00 PM	4	629	165	0	20	4	0	4	4	7	0	1	8	**846**
7:00 PM	3	489	117	0	15	4	0	1	10	2	0	0	5	**646**
8:00 PM	5	384	97	0	11	6	0	2	7	2	0	0	4	**518**
9:00 PM	4	312	77	0	6	5	0	1	9	1	0	0	1	**416**
10:00 PM	2	246	50	0	6	1	0	0	9	3	0	0	1	**318**
11:00 PM	3	165	34	0	4	2	0	0	6	0	1	0	1	**216**
Total	**123**	**10,318**	**3,140**	**18**	**547**	**179**	**0**	**59**	**178**	**109**	**5**	**2**	**119**	**14,797**
Percent	**0.8%**	**69.7%**	**21.2%**	**0.1%**	**3.7%**	**1.2%**	**0.0%**	**0.4%**	**1.2%**	**0.7%**	**0.0%**	**0.0%**	**0.8%**	

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Olivero Rd
Date Range: 11/9/2017 to 11/9/2017
Site Code: 01

Total Study Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	**3**
1:00 AM	0	31	13	2	8	1	0	0	5	0	0	0	0	**60**
2:00 AM	2	45	13	1	7	4	0	0	9	0	2	0	0	**83**
3:00 AM	1	64	16	2	5	5	0	0	10	0	0	0	0	**103**
4:00 AM	2	128	46	1	19	9	0	0	11	1	2	0	0	**219**
5:00 AM	5	222	99	1	23	19	0	0	15	2	1	0	3	**390**
6:00 AM	12	273	129	2	41	31	0	1	23	2	0	2	2	**518**
7:00 AM	25	469	192	1	48	34	0	1	15	4	0	0	17	**806**
8:00 AM	19	596	205	3	36	22	0	1	8	9	0	1	24	**924**
9:00 AM	17	579	216	1	39	23	0	1	7	13	1	0	15	**912**
10:00 AM	11	547	239	1	53	26	0	1	11	8	0	0	8	**905**
11:00 AM	26	673	259	2	45	28	0	0	5	5	0	0	8	**1,051**
12:00 PM	11	645	253	0	42	19	0	2	3	7	0	0	9	**991**
1:00 PM	26	617	253	1	44	12	0	0	13	7	0	1	13	**987**
2:00 PM	22	704	227	2	50	23	0	2	14	3	0	0	7	**1,054**
3:00 PM	22	803	228	0	43	23	0	0	7	11	0	0	12	**1,149**
4:00 PM	11	808	220	0	23	28	0	1	9	16	0	0	15	**1,131**
5:00 PM	25	789	208	0	26	18	0	1	13	18	0	0	27	**1,125**
6:00 PM	7	637	180	0	38	22	0	3	3	11	0	0	10	**911**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	383	88	0	13	7	0	0	1	2	0	0	2	**496**
9:00 PM	5	307	72	0	13	7	0	0	8	3	1	0	2	**418**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	3	153	27	0	3	7	0	0	7	0	0	0	0	**200**
Total	**252**	**9,476**	**3,183**	**20**	**619**	**368**	**0**	**14**	**197**	**122**	**7**	**4**	**174**	**14,436**
Percent	**1.7%**	**65.6%**	**22.0%**	**0.1%**	**4.3%**	**2.5%**	**0.0%**	**0.1%**	**1.4%**	**0.8%**	**0.0%**	**0.0%**	**1.2%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O Olivero Rd
Date Range: 11/9/2017 to 11/9/2017
Site Code: 01

Total Study Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	2	37	9	1	2	0	0	0	8	0	0	0	1	**60**
2:00 AM	3	58	13	2	7	2	0	0	11	0	0	0	0	**96**
3:00 AM	5	136	31	2	6	5	0	0	5	1	1	0	0	**192**
4:00 AM	1	131	42	1	13	1	0	1	7	0	1	0	0	**198**
5:00 AM	7	202	89	1	19	5	0	0	14	0	0	0	1	**338**
6:00 AM	3	347	133	1	44	10	0	2	10	3	0	0	5	**558**
7:00 AM	8	601	187	3	41	15	0	2	9	4	0	0	7	**877**
8:00 AM	8	640	219	1	37	18	0	3	7	18	0	0	10	**961**
9:00 AM	10	496	218	2	44	16	0	1	13	4	0	0	5	**809**
10:00 AM	3	573	189	1	52	10	0	9	4	6	0	0	6	**853**
11:00 AM	1	615	189	1	30	13	0	2	9	5	1	0	11	**877**
12:00 PM	7	695	199	0	45	16	0	2	7	12	0	0	9	**992**
1:00 PM	11	724	198	0	32	11	0	6	11	9	0	0	12	**1,014**
2:00 PM	5	769	194	0	24	11	0	10	7	7	1	1	10	**1,039**
3:00 PM	7	688	210	0	32	12	0	6	4	8	0	0	11	**978**
4:00 PM	11	679	258	2	31	9	0	3	5	9	0	0	9	**1,016**
5:00 PM	10	702	222	0	26	3	0	4	2	8	0	0	2	**979**
6:00 PM	4	629	165	0	20	4	0	4	4	7	0	1	8	**846**
7:00 PM	3	489	117	0	15	4	0	1	10	2	0	0	5	**646**
8:00 PM	5	384	97	0	11	6	0	2	7	2	0	0	4	**518**
9:00 PM	4	312	77	0	6	5	0	1	9	1	0	0	1	**416**
10:00 PM	2	246	50	0	6	1	0	0	9	3	0	0	1	**318**
11:00 PM	3	165	34	0	4	2	0	0	6	0	1	0	1	**216**
Total	**123**	**10,318**	**3,140**	**18**	**547**	**179**	**0**	**59**	**178**	**109**	**5**	**2**	**119**	**14,797**
Percent	**0.8%**	**69.7%**	**21.2%**	**0.1%**	**3.7%**	**1.2%**	**0.0%**	**0.4%**	**1.2%**	**0.7%**	**0.0%**	**0.0%**	**0.8%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O Olivero Rd
Date Range: 11/9/2017 to 11/9/2017
Site Code: 01

IDAX DATA SOLUTIONS

3-Day (Tuesday - Thursday) Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	**3**
1:00 AM	0	31	13	2	8	1	0	0	5	0	0	0	0	**60**
2:00 AM	2	45	13	1	7	4	0	0	9	0	2	0	0	**83**
3:00 AM	1	64	16	2	5	5	0	0	10	0	0	0	0	**103**
4:00 AM	2	128	46	1	19	9	0	0	11	1	2	0	0	**219**
5:00 AM	5	222	99	1	23	19	0	0	15	2	1	0	3	**390**
6:00 AM	12	273	129	2	41	31	0	1	23	2	0	2	2	**518**
7:00 AM	25	469	192	1	48	34	0	1	15	4	0	0	17	**806**
8:00 AM	19	596	205	3	36	22	0	1	8	9	0	1	24	**924**
9:00 AM	17	579	216	1	39	23	0	1	7	13	1	0	15	**912**
10:00 AM	11	547	239	1	53	26	0	1	11	8	0	0	8	**905**
11:00 AM	26	673	259	2	45	28	0	0	5	5	0	0	8	**1,051**
12:00 PM	11	645	253	0	42	19	0	2	3	7	0	0	9	**991**
1:00 PM	26	617	253	1	44	12	0	0	13	7	0	1	13	**987**
2:00 PM	22	704	227	2	50	23	0	2	14	3	0	0	7	**1,054**
3:00 PM	22	803	228	0	43	23	0	0	7	11	0	0	12	**1,149**
4:00 PM	11	808	220	0	23	28	0	1	9	16	0	0	15	**1,131**
5:00 PM	25	789	208	0	26	18	0	1	13	18	0	0	27	**1,125**
6:00 PM	7	637	180	0	38	22	0	3	3	11	0	0	10	**911**
7:00 PM	3	467	112	0	20	14	0	0	4	4	0	0	1	**625**
8:00 PM	0	383	88	0	13	7	0	0	1	2	0	0	2	**496**
9:00 PM	5	307	72	0	13	7	0	0	8	3	1	0	2	**418**
10:00 PM	2	189	37	0	5	5	0	0	5	1	0	0	1	**245**
11:00 PM	3	153	27	0	3	7	0	0	7	0	0	0	0	**200**
Total	**257**	**10,132**	**3,332**	**20**	**644**	**387**	**0**	**14**	**206**	**127**	**7**	**4**	**176**	**15,306**
Percent	**1.7%**	**66.2%**	**21.8%**	**0.1%**	**4.2%**	**2.5%**	**0.0%**	**0.1%**	**1.3%**	**0.8%**	**0.0%**	**0.0%**	**1.1%**	

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Olivero Rd
Date Range: 11/9/2017 to 11/9/2017
Site Code: 01

3-Day (Tuesday - Thursday) Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 AM	2	37	9	1	2	0	0	0	8	0	0	0	1	**60**
2:00 AM	3	58	13	2	7	2	0	0	11	0	0	0	0	**96**
3:00 AM	5	136	31	2	6	5	0	0	5	1	1	0	0	**192**
4:00 AM	1	131	42	1	13	1	0	1	7	0	1	0	0	**198**
5:00 AM	7	202	89	1	19	5	0	0	14	0	0	0	1	**338**
6:00 AM	3	347	133	1	44	10	0	2	10	3	0	0	5	**558**
7:00 AM	8	601	187	3	41	15	0	2	9	4	0	0	7	**877**
8:00 AM	8	640	219	1	37	18	0	3	7	18	0	0	10	**961**
9:00 AM	10	496	218	2	44	16	0	1	13	4	0	0	5	**809**
10:00 AM	3	573	189	1	52	10	0	9	4	6	0	0	6	**853**
11:00 AM	1	615	189	1	30	13	0	2	9	5	1	0	11	**877**
12:00 PM	7	695	199	0	45	16	0	2	7	12	0	0	9	**992**
1:00 PM	11	724	198	0	32	11	0	6	11	9	0	0	12	**1,014**
2:00 PM	5	769	194	0	24	11	0	10	7	7	1	1	10	**1,039**
3:00 PM	7	688	210	0	32	12	0	6	4	8	0	0	11	**978**
4:00 PM	11	679	258	2	31	9	0	3	5	9	0	0	9	**1,016**
5:00 PM	10	702	222	0	26	3	0	4	2	8	0	0	2	**979**
6:00 PM	4	629	165	0	20	4	0	4	4	7	0	1	8	**846**
7:00 PM	3	489	117	0	15	4	0	1	10	2	0	0	5	**646**
8:00 PM	5	384	97	0	11	6	0	2	7	2	0	0	4	**518**
9:00 PM	4	312	77	0	6	5	0	1	9	1	0	0	1	**416**
10:00 PM	2	246	50	0	6	1	0	0	9	3	0	0	1	**318**
11:00 PM	3	165	34	0	4	2	0	0	6	0	1	0	1	**216**
Total	**123**	**10,318**	**3,140**	**18**	**547**	**179**	**0**	**59**	**178**	**109**	**5**	**2**	**119**	**14,797**
Percent	**0.8%**	**69.7%**	**21.2%**	**0.1%**	**3.7%**	**1.2%**	**0.0%**	**0.4%**	**1.2%**	**0.7%**	**0.0%**	**0.0%**	**0.8%**	

Vehicle Classification Report Summary

Location: Crows Landing Rd N/O Colusa Ave

Count Direction: Northbound / Southbound

Date Range: 11/9/2017 to 11/9/2017

Site Code: 02

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Study Total														
Northbound	151	9,720	2,659	22	710	202	0	32	173	43	10	2	47	13,771
Percent	1.1%	70.6%	19.3%	0.2%	5.2%	1.5%	0.0%	0.2%	1.3%	0.3%	0.1%	0.0%	0.3%	100%
Southbound	101	10,222	2,563	25	710	230	0	43	303	44	15	2	49	14,307
Percent	0.7%	71.4%	17.9%	0.2%	5.0%	1.6%	0.0%	0.3%	2.1%	0.3%	0.1%	0.0%	0.3%	100%
Total	252	19,942	5,222	47	1,420	432	0	75	476	87	25	4	96	28,078
Percent	0.9%	71.0%	18.6%	0.2%	5.1%	1.5%	0.0%	0.3%	1.7%	0.3%	0.1%	0.0%	0.3%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Location: Crows Landing Rd N/O Colusa Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 02

Thursday, November 9, 2017
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	65	10	0	2	0	0	0	5	0	0	0	0	**82**
1:00 AM	0	32	11	0	3	0	0	0	11	0	1	0	1	**59**
2:00 AM	1	56	13	1	1	4	0	0	12	0	0	0	0	**88**
3:00 AM	1	111	28	3	6	1	0	1	9	0	0	0	1	**161**
4:00 AM	0	108	38	1	9	3	0	1	4	4	2	0	0	**170**
5:00 AM	2	223	79	1	13	4	0	1	16	0	0	0	2	**341**
6:00 AM	2	443	105	1	29	10	0	2	14	3	0	0	1	**610**
7:00 AM	7	661	129	0	44	18	0	4	17	7	1	0	7	**895**
8:00 AM	6	687	161	1	48	15	0	5	21	2	0	0	3	**949**
9:00 AM	3	483	162	1	59	20	0	4	23	1	1	0	2	**759**
10:00 AM	7	538	164	2	61	12	0	3	13	2	2	0	1	**805**
11:00 AM	8	568	171	2	53	22	0	1	19	2	0	1	2	**849**
12:00 PM	7	613	203	1	78	27	0	3	18	2	1	0	3	**956**
1:00 PM	8	638	171	2	72	31	0	2	19	6	3	1	4	**957**
2:00 PM	10	743	194	1	49	19	0	4	20	2	0	0	3	**1,045**
3:00 PM	6	717	187	2	57	12	0	4	14	0	0	0	1	**1,000**
4:00 PM	10	721	197	3	44	8	0	3	6	3	1	0	3	**999**
5:00 PM	7	720	169	1	24	7	0	3	9	3	1	0	6	**950**
6:00 PM	4	603	145	1	20	2	0	1	12	3	1	0	3	**795**
7:00 PM	3	463	67	0	14	7	0	1	6	1	0	0	3	**565**
8:00 PM	4	343	60	0	11	1	0	0	14	1	0	0	2	**436**
9:00 PM	3	308	41	0	5	3	0	0	6	1	0	0	0	**367**
10:00 PM	1	230	34	1	7	2	0	0	7	1	0	0	1	**284**
11:00 PM	1	148	24	0	1	2	0	0	8	0	1	0	0	**185**
Total	**101**	**10,222**	**2,563**	**25**	**710**	**230**	**0**	**43**	**303**	**44**	**15**	**2**	**49**	**14,307**
Percent	**0.7%**	**71.4%**	**17.9%**	**0.2%**	**5.0%**	**1.6%**	**0.0%**	**0.3%**	**2.1%**	**0.3%**	**0.1%**	**0.0%**	**0.3%**	

Location: Crows Landing Rd N/O Colusa Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 02

Total Study Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	33	4	0	0	0	0	0	1	0	0	0	1	**39**
1:00 AM	0	40	15	1	2	0	0	0	3	1	0	0	0	**62**
2:00 AM	0	41	15	2	3	2	0	0	9	0	2	0	0	**74**
3:00 AM	1	58	21	2	9	2	0	0	9	2	0	0	0	**104**
4:00 AM	0	111	34	1	21	6	0	0	8	1	2	0	2	**186**
5:00 AM	4	195	67	1	20	11	0	1	10	4	2	0	4	**319**
6:00 AM	13	278	91	3	38	12	0	1	18	2	0	1	3	**460**
7:00 AM	8	497	124	2	61	19	0	1	13	6	0	0	6	**737**
8:00 AM	7	616	165	3	55	21	0	2	8	3	0	1	2	**883**
9:00 AM	14	605	169	3	52	16	0	2	15	3	0	0	3	**882**
10:00 AM	14	498	187	1	63	15	0	1	12	4	1	0	2	**798**
11:00 AM	13	626	208	1	44	14	0	2	5	2	1	0	5	**921**
12:00 PM	12	650	194	0	47	10	0	5	6	1	0	0	1	**926**
1:00 PM	9	557	164	0	59	14	0	3	10	3	2	0	3	**824**
2:00 PM	8	660	178	1	46	10	0	6	7	0	0	0	3	**919**
3:00 PM	13	773	220	0	44	11	0	3	4	4	0	0	4	**1,076**
4:00 PM	6	812	211	0	44	8	0	4	3	2	0	0	4	**1,094**
5:00 PM	12	836	198	0	43	7	0	1	1	4	0	0	1	**1,103**
6:00 PM	6	609	145	0	20	5	0	0	2	1	0	0	2	**790**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	0	272	71	0	9	2	0	0	3	0	0	0	0	**357**
9:00 PM	4	265	48	0	10	2	0	0	14	0	0	0	0	**343**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	1	131	23	0	1	3	0	0	5	0	0	0	0	**164**
Total	**145**	**9,163**	**2,552**	**21**	**691**	**190**	**0**	**32**	**166**	**43**	**10**	**2**	**46**	**13,061**
Percent	**1.1%**	**70.2%**	**19.5%**	**0.2%**	**5.3%**	**1.5%**	**0.0%**	**0.2%**	**1.3%**	**0.3%**	**0.1%**	**0.0%**	**0.4%**	

Note: Average only condsidered on days with 24-hours of data.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Colusa Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 02

Total Study Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	65	10	0	2	0	0	0	5	0	0	0	0	**82**
1:00 AM	0	32	11	0	3	0	0	0	11	0	1	0	1	**59**
2:00 AM	1	56	13	1	1	4	0	0	12	0	0	0	0	**88**
3:00 AM	1	111	28	3	6	1	0	1	9	0	0	0	1	**161**
4:00 AM	0	108	38	1	9	3	0	1	4	4	2	0	0	**170**
5:00 AM	2	223	79	1	13	4	0	1	16	0	0	0	2	**341**
6:00 AM	2	443	105	1	29	10	0	2	14	3	0	0	1	**610**
7:00 AM	7	661	129	0	44	18	0	4	17	7	1	0	7	**895**
8:00 AM	6	687	161	1	48	15	0	5	21	2	0	0	3	**949**
9:00 AM	3	483	162	1	59	20	0	4	23	1	1	0	2	**759**
10:00 AM	7	538	164	2	61	12	0	3	13	2	2	0	1	**805**
11:00 AM	8	568	171	2	53	22	0	1	19	2	0	1	2	**849**
12:00 PM	7	613	203	1	78	27	0	3	18	2	1	0	3	**956**
1:00 PM	8	638	171	2	72	31	0	2	19	6	3	1	4	**957**
2:00 PM	10	743	194	1	49	19	0	4	20	2	0	0	3	**1,045**
3:00 PM	6	717	187	2	57	12	0	4	14	0	0	0	1	**1,000**
4:00 PM	10	721	197	3	44	8	0	3	6	3	1	0	3	**999**
5:00 PM	7	720	169	1	24	7	0	3	9	3	1	0	6	**950**
6:00 PM	4	603	145	1	20	2	0	1	12	3	1	0	3	**795**
7:00 PM	3	463	67	0	14	7	0	1	6	1	0	0	3	**565**
8:00 PM	4	343	60	0	11	1	0	0	14	1	0	0	2	**436**
9:00 PM	3	308	41	0	5	3	0	0	6	1	0	0	0	**367**
10:00 PM	1	230	34	1	7	2	0	0	7	1	0	0	1	**284**
11:00 PM	1	148	24	0	1	2	0	0	8	0	1	0	0	**185**
Total	**101**	**10,222**	**2,563**	**25**	**710**	**230**	**0**	**43**	**303**	**44**	**15**	**2**	**49**	**14,307**
Percent	**0.7%**	**71.4%**	**17.9%**	**0.2%**	**5.0%**	**1.6%**	**0.0%**	**0.3%**	**2.1%**	**0.3%**	**0.1%**	**0.0%**	**0.3%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O Colusa Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 02

3-Day (Tuesday - Thursday) Average
Northbound

	FHWA Vehicle Classification													Total
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	33	4	0	0	0	0	0	1	0	0	0	1	**39**
1:00 AM	0	40	15	1	2	0	0	0	3	1	0	0	0	**62**
2:00 AM	0	41	15	2	3	2	0	0	9	0	2	0	0	**74**
3:00 AM	1	58	21	2	9	2	0	0	9	2	0	0	0	**104**
4:00 AM	0	111	34	1	21	6	0	0	8	1	2	0	2	**186**
5:00 AM	4	195	67	1	20	11	0	1	10	4	2	0	4	**319**
6:00 AM	13	278	91	3	38	12	0	1	18	2	0	1	3	**460**
7:00 AM	8	497	124	2	61	19	0	1	13	6	0	0	6	**737**
8:00 AM	7	616	165	3	55	21	0	2	8	3	0	1	2	**883**
9:00 AM	14	605	169	3	52	16	0	2	15	3	0	0	3	**882**
10:00 AM	14	498	187	1	63	15	0	1	12	4	1	0	2	**798**
11:00 AM	13	626	208	1	44	14	0	2	5	2	1	0	5	**921**
12:00 PM	12	650	194	0	47	10	0	5	6	1	0	0	1	**926**
1:00 PM	9	557	164	0	59	14	0	3	10	3	2	0	3	**824**
2:00 PM	8	660	178	1	46	10	0	6	7	0	0	0	3	**919**
3:00 PM	13	773	220	0	44	11	0	3	4	4	0	0	4	**1,076**
4:00 PM	6	812	211	0	44	8	0	4	3	2	0	0	4	**1,094**
5:00 PM	12	836	198	0	43	7	0	1	1	4	0	0	1	**1,103**
6:00 PM	6	609	145	0	20	5	0	0	2	1	0	0	2	**790**
7:00 PM	5	398	88	1	12	9	0	0	2	0	0	0	1	**516**
8:00 PM	0	272	71	0	9	2	0	0	3	0	0	0	0	**357**
9:00 PM	4	265	48	0	10	2	0	0	14	0	0	0	0	**343**
10:00 PM	1	159	19	0	7	3	0	0	5	0	0	0	0	**194**
11:00 PM	1	131	23	0	1	3	0	0	5	0	0	0	0	**164**
Total	**151**	**9,720**	**2,659**	**22**	**710**	**202**	**0**	**32**	**173**	**43**	**10**	**2**	**47**	**13,771**
Percent	**1.1%**	**70.6%**	**19.3%**	**0.2%**	**5.2%**	**1.5%**	**0.0%**	**0.2%**	**1.3%**	**0.3%**	**0.1%**	**0.0%**	**0.3%**	

Location: Crows Landing Rd N/O Colusa Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 02

3-Day (Tuesday - Thursday) Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	65	10	0	2	0	0	0	5	0	0	0	0	**82**
1:00 AM	0	32	11	0	3	0	0	0	11	0	1	0	1	**59**
2:00 AM	1	56	13	1	1	4	0	0	12	0	0	0	0	**88**
3:00 AM	1	111	28	3	6	1	0	1	9	0	0	0	1	**161**
4:00 AM	0	108	38	1	9	3	0	1	4	4	2	0	0	**170**
5:00 AM	2	223	79	1	13	4	0	1	16	0	0	0	2	**341**
6:00 AM	2	443	105	1	29	10	0	2	14	3	0	0	1	**610**
7:00 AM	7	661	129	0	44	18	0	4	17	7	1	0	7	**895**
8:00 AM	6	687	161	1	48	15	0	5	21	2	0	0	3	**949**
9:00 AM	3	483	162	1	59	20	0	4	23	1	1	0	2	**759**
10:00 AM	7	538	164	2	61	12	0	3	13	2	2	0	1	**805**
11:00 AM	8	568	171	2	53	22	0	1	19	2	0	1	2	**849**
12:00 PM	7	613	203	1	78	27	0	3	18	2	1	0	3	**956**
1:00 PM	8	638	171	2	72	31	0	2	19	6	3	1	4	**957**
2:00 PM	10	743	194	1	49	19	0	4	20	2	0	0	3	**1,045**
3:00 PM	6	717	187	2	57	12	0	4	14	0	0	0	1	**1,000**
4:00 PM	10	721	197	3	44	8	0	3	6	3	1	0	3	**999**
5:00 PM	7	720	169	1	24	7	0	3	9	3	1	0	6	**950**
6:00 PM	4	603	145	1	20	2	0	1	12	3	1	0	3	**795**
7:00 PM	3	463	67	0	14	7	0	1	6	1	0	0	3	**565**
8:00 PM	4	343	60	0	11	1	0	0	14	1	0	0	2	**436**
9:00 PM	3	308	41	0	5	3	0	0	6	1	0	0	0	**367**
10:00 PM	1	230	34	1	7	2	0	0	7	1	0	0	1	**284**
11:00 PM	1	148	24	0	1	2	0	0	8	0	1	0	0	**185**
Total	**101**	**10,222**	**2,563**	**25**	**710**	**230**	**0**	**43**	**303**	**44**	**15**	**2**	**49**	**14,307**
Percent	**0.7%**	**71.4%**	**17.9%**	**0.2%**	**5.0%**	**1.6%**	**0.0%**	**0.3%**	**2.1%**	**0.3%**	**0.1%**	**0.0%**	**0.3%**	

Vehicle Classification Report Summary

Location: Crows Landing Rd N/O Imperial Ave

Count Direction: Northbound / Southbound

Date Range: 11/9/2017 to 11/9/2017

Site Code: 03

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Study Total														
Northbound	76	8,799	2,769	19	788	377	0	41	240	63	20	3	79	13,274
Percent	0.6%	66.3%	20.9%	0.1%	5.9%	2.8%	0.0%	0.3%	1.8%	0.5%	0.2%	0.0%	0.6%	100%
Southbound	47	9,159	3,166	30	1,127	184	0	27	326	44	26	4	28	14,168
Percent	0.3%	64.6%	22.3%	0.2%	8.0%	1.3%	0.0%	0.2%	2.3%	0.3%	0.2%	0.0%	0.2%	100%
Total	123	17,958	5,935	49	1,915	561	0	68	566	107	46	7	107	27,442
Percent	0.4%	65.4%	21.6%	0.2%	7.0%	2.0%	0.0%	0.2%	2.1%	0.4%	0.2%	0.0%	0.4%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Imperial Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 03

Thursday, November 9, 2017
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	72	16	0	6	2	0	0	9	1	2	0	0	108
1:00 AM	0	27	11	0	5	1	0	1	11	1	1	0	0	58
2:00 AM	0	56	8	1	8	2	0	0	7	2	0	0	3	87
3:00 AM	1	100	29	3	8	4	0	1	5	1	0	0	0	152
4:00 AM	0	104	39	2	18	5	0	1	8	4	2	0	0	183
5:00 AM	0	195	94	2	35	10	0	0	15	5	0	0	2	358
6:00 AM	1	384	132	1	51	10	0	2	17	1	1	0	1	601
7:00 AM	3	636	172	2	52	8	0	3	22	1	0	0	1	900
8:00 AM	1	656	176	4	64	12	0	1	22	0	0	0	0	936
9:00 AM	7	439	181	1	72	11	0	4	23	0	2	0	0	740
10:00 AM	4	485	178	3	81	13	0	2	15	0	1	0	2	784
11:00 AM	6	530	186	1	62	12	0	2	18	0	1	1	3	822
12:00 PM	6	519	233	2	95	11	0	1	21	1	3	0	1	893
1:00 PM	6	607	212	3	87	13	0	2	23	3	4	1	1	962
2:00 PM	1	705	244	0	71	10	0	2	20	2	0	1	0	1,056
3:00 PM	0	653	223	1	84	4	0	1	18	2	2	0	0	988
4:00 PM	0	590	279	1	90	6	0	1	9	1	2	0	1	980
5:00 PM	4	647	231	1	71	7	0	1	7	2	1	0	1	973
6:00 PM	2	517	192	0	71	13	0	0	14	5	1	0	2	817
7:00 PM	1	361	131	1	45	12	0	0	7	1	0	0	1	560
8:00 PM	1	285	74	0	26	6	0	1	12	4	1	1	4	415
9:00 PM	2	257	57	0	11	2	0	0	4	4	1	0	2	340
10:00 PM	1	207	37	1	9	5	0	1	11	2	0	0	3	277
11:00 PM	0	127	31	0	5	5	0	0	8	1	1	0	0	178
Total	**47**	**9,159**	**3,166**	**30**	**1,127**	**184**	**0**	**27**	**326**	**44**	**26**	**4**	**28**	**14,168**
Percent	**0.3%**	**64.6%**	**22.3%**	**0.2%**	**8.0%**	**1.3%**	**0.0%**	**0.2%**	**2.3%**	**0.3%**	**0.2%**	**0.0%**	**0.2%**	

Location: **Crows Landing Rd N/O Imperial Ave**
Date Range: **11/9/2017 to 11/9/2017**
Site Code: **03**

Total Study Average
Northbound

	FHWA Vehicle Classification													Total
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	69	8	0	5	3	0	0	6	0	0	0	1	**92**
1:00 AM	1	36	14	1	5	2	0	0	3	1	0	0	0	**63**
2:00 AM	0	43	11	2	5	3	0	0	8	1	2	0	1	**76**
3:00 AM	2	51	15	2	6	4	0	2	7	1	0	0	1	**91**
4:00 AM	0	98	31	1	19	8	0	0	7	4	4	0	1	**173**
5:00 AM	0	201	64	1	20	19	0	2	13	1	3	0	2	**326**
6:00 AM	2	257	100	2	34	21	0	4	21	1	0	0	8	**450**
7:00 AM	5	473	139	3	58	22	0	2	11	8	0	0	8	**729**
8:00 AM	2	558	191	3	70	34	0	2	11	5	1	0	4	**881**
9:00 AM	6	514	176	0	56	33	0	4	13	2	2	0	8	**814**
10:00 AM	7	464	172	1	52	30	0	3	22	5	0	0	5	**761**
11:00 AM	4	542	225	1	60	14	0	3	12	8	2	0	6	**877**
12:00 PM	5	543	210	0	51	24	0	5	12	3	0	0	3	**856**
1:00 PM	5	499	157	0	61	19	0	2	14	3	3	1	6	**770**
2:00 PM	4	571	206	2	45	33	0	2	13	1	0	1	3	**881**
3:00 PM	5	757	211	0	43	22	0	2	9	7	2	0	7	**1,065**
4:00 PM	4	776	235	0	57	13	0	2	5	6	1	1	5	**1,105**
5:00 PM	7	771	217	0	52	13	0	3	8	1	0	0	5	**1,077**
6:00 PM	5	514	133	0	31	22	0	2	8	1	0	0	0	**716**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	1	257	69	0	11	10	0	0	3	0	0	0	2	**353**
9:00 PM	4	220	51	0	13	7	0	0	11	2	0	0	1	**309**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	2	120	25	0	3	4	0	0	10	0	0	0	1	**165**
Total	**71**	**8,334**	**2,660**	**19**	**757**	**360**	**0**	**40**	**227**	**61**	**20**	**3**	**78**	**12,630**
Percent	**0.6%**	**66.0%**	**21.1%**	**0.2%**	**6.0%**	**2.9%**	**0.0%**	**0.3%**	**1.8%**	**0.5%**	**0.2%**	**0.0%**	**0.6%**	

Note: Average only condsidered on days with 24-hours of data.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Imperial Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 03

Total Study Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	72	16	0	6	2	0	0	9	1	2	0	0	**108**
1:00 AM	0	27	11	0	5	1	0	1	11	1	1	0	0	**58**
2:00 AM	0	56	8	1	8	2	0	0	7	2	0	0	3	**87**
3:00 AM	1	100	29	3	8	4	0	1	5	1	0	0	0	**152**
4:00 AM	0	104	39	2	18	5	0	1	8	4	2	0	0	**183**
5:00 AM	0	195	94	2	35	10	0	0	15	5	0	0	2	**358**
6:00 AM	1	384	132	1	51	10	0	2	17	1	1	0	1	**601**
7:00 AM	3	636	172	2	52	8	0	3	22	1	0	0	1	**900**
8:00 AM	1	656	176	4	64	12	0	1	22	0	0	0	0	**936**
9:00 AM	7	439	181	1	72	11	0	4	23	0	2	0	0	**740**
10:00 AM	4	485	178	3	81	13	0	2	15	0	1	0	2	**784**
11:00 AM	6	530	186	1	62	12	0	2	18	0	1	1	3	**822**
12:00 PM	6	519	233	2	95	11	0	1	21	1	3	0	1	**893**
1:00 PM	6	607	212	3	87	13	0	2	23	3	4	1	1	**962**
2:00 PM	1	705	244	0	71	10	0	2	20	2	0	1	0	**1,056**
3:00 PM	0	653	223	1	84	4	0	1	18	2	2	0	0	**988**
4:00 PM	0	590	279	1	90	6	0	1	9	1	2	0	1	**980**
5:00 PM	4	647	231	1	71	7	0	1	7	2	1	0	1	**973**
6:00 PM	2	517	192	0	71	13	0	0	14	5	1	0	2	**817**
7:00 PM	1	361	131	1	45	12	0	0	7	1	0	0	1	**560**
8:00 PM	1	285	74	0	26	6	0	1	12	4	1	1	4	**415**
9:00 PM	2	257	57	0	11	2	0	0	4	4	1	0	2	**340**
10:00 PM	1	207	37	1	9	5	0	1	11	2	0	0	3	**277**
11:00 PM	0	127	31	0	5	5	0	0	8	1	1	0	0	**178**
Total	**47**	**9,159**	**3,166**	**30**	**1,127**	**184**	**0**	**27**	**326**	**44**	**26**	**4**	**28**	**14,168**
Percent	**0.3%**	**64.6%**	**22.3%**	**0.2%**	**8.0%**	**1.3%**	**0.0%**	**0.2%**	**2.3%**	**0.3%**	**0.2%**	**0.0%**	**0.2%**	

Note: Average only condsidered on days with 24-hours of data.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Imperial Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 03

3-Day (Tuesday - Thursday) Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	69	8	0	5	3	0	0	6	0	0	0	1	**92**
1:00 AM	1	36	14	1	5	2	0	0	3	1	0	0	0	**63**
2:00 AM	0	43	11	2	5	3	0	0	8	1	2	0	1	**76**
3:00 AM	2	51	15	2	6	4	0	2	7	1	0	0	1	**91**
4:00 AM	0	98	31	1	19	8	0	0	7	4	4	0	1	**173**
5:00 AM	0	201	64	1	20	19	0	2	13	1	3	0	2	**326**
6:00 AM	2	257	100	2	34	21	0	4	21	1	0	0	8	**450**
7:00 AM	5	473	139	3	58	22	0	2	11	8	0	0	8	**729**
8:00 AM	2	558	191	3	70	34	0	2	11	5	1	0	4	**881**
9:00 AM	6	514	176	0	56	33	0	4	13	2	2	0	8	**814**
10:00 AM	7	464	172	1	52	30	0	3	22	5	0	0	5	**761**
11:00 AM	4	542	225	1	60	14	0	3	12	8	2	0	6	**877**
12:00 PM	5	543	210	0	51	24	0	5	12	3	0	0	3	**856**
1:00 PM	5	499	157	0	61	19	0	2	14	3	3	1	6	**770**
2:00 PM	4	571	206	2	45	33	0	2	13	1	0	1	3	**881**
3:00 PM	5	757	211	0	43	22	0	2	9	7	2	0	7	**1,065**
4:00 PM	4	776	235	0	57	13	0	2	5	6	1	1	5	**1,105**
5:00 PM	7	771	217	0	52	13	0	3	8	1	0	0	5	**1,077**
6:00 PM	5	514	133	0	31	22	0	2	8	1	0	0	0	**716**
7:00 PM	5	343	85	0	22	11	0	1	4	1	0	0	1	**473**
8:00 PM	1	257	69	0	11	10	0	0	3	0	0	0	2	**353**
9:00 PM	4	220	51	0	13	7	0	0	11	2	0	0	1	**309**
10:00 PM	0	122	24	0	9	6	0	0	9	1	0	0	0	**171**
11:00 PM	2	120	25	0	3	4	0	0	10	0	0	0	1	**165**
Total	**76**	**8,799**	**2,769**	**19**	**788**	**377**	**0**	**41**	**240**	**63**	**20**	**3**	**79**	**13,274**
Percent	**0.6%**	**66.3%**	**20.9%**	**0.1%**	**5.9%**	**2.8%**	**0.0%**	**0.3%**	**1.8%**	**0.5%**	**0.2%**	**0.0%**	**0.6%**	

Location: Crows Landing Rd N/O Imperial Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 03

3-Day (Tuesday - Thursday) Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	72	16	0	6	2	0	0	9	1	2	0	0	**108**
1:00 AM	0	27	11	0	5	1	0	1	11	1	1	0	0	**58**
2:00 AM	0	56	8	1	8	2	0	0	7	2	0	0	3	**87**
3:00 AM	1	100	29	3	8	4	0	1	5	1	0	0	0	**152**
4:00 AM	0	104	39	2	18	5	0	1	8	4	2	0	0	**183**
5:00 AM	0	195	94	2	35	10	0	0	15	5	0	0	2	**358**
6:00 AM	1	384	132	1	51	10	0	2	17	1	1	0	1	**601**
7:00 AM	3	636	172	2	52	8	0	3	22	1	0	0	1	**900**
8:00 AM	1	656	176	4	64	12	0	1	22	0	0	0	0	**936**
9:00 AM	7	439	181	1	72	11	0	4	23	0	2	0	0	**740**
10:00 AM	4	485	178	3	81	13	0	2	15	0	1	0	2	**784**
11:00 AM	6	530	186	1	62	12	0	2	18	0	1	1	3	**822**
12:00 PM	6	519	233	2	95	11	0	1	21	1	3	0	1	**893**
1:00 PM	6	607	212	3	87	13	0	2	23	3	4	1	1	**962**
2:00 PM	1	705	244	0	71	10	0	2	20	2	0	1	0	**1,056**
3:00 PM	0	653	223	1	84	4	0	1	18	2	2	0	0	**988**
4:00 PM	0	590	279	1	90	6	0	1	9	1	2	0	1	**980**
5:00 PM	4	647	231	1	71	7	0	1	7	2	1	0	1	**973**
6:00 PM	2	517	192	0	71	13	0	0	14	5	1	0	2	**817**
7:00 PM	1	361	131	1	45	12	0	0	7	1	0	0	1	**560**
8:00 PM	1	285	74	0	26	6	0	1	12	4	1	1	4	**415**
9:00 PM	2	257	57	0	11	2	0	0	4	4	1	0	2	**340**
10:00 PM	1	207	37	1	9	5	0	1	11	2	0	0	3	**277**
11:00 PM	0	127	31	0	5	5	0	0	8	1	1	0	0	**178**
Total	**47**	**9,159**	**3,166**	**30**	**1,127**	**184**	**0**	**27**	**326**	**44**	**26**	**4**	**28**	**14,168**
Percent	**0.3%**	**64.6%**	**22.3%**	**0.2%**	**8.0%**	**1.3%**	**0.0%**	**0.2%**	**2.3%**	**0.3%**	**0.2%**	**0.0%**	**0.2%**	

Vehicle Classification Report Summary

Location: Crows Landing Rd N/O Algen Ave

Count Direction: Northbound / Southbound

Date Range: 11/9/2017 to 11/9/2017

Site Code: 04

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Study Total														
Northbound	57	8,057	2,896	25	846	149	0	30	298	38	21	1	61	12,479
Percent	0.5%	64.6%	23.2%	0.2%	6.8%	1.2%	0.0%	0.2%	2.4%	0.3%	0.2%	0.0%	0.5%	100%
Southbound	36	8,582	2,789	23	773	138	0	34	360	21	27	5	14	12,802
Percent	0.3%	67.0%	21.8%	0.2%	6.0%	1.1%	0.0%	0.3%	2.8%	0.2%	0.2%	0.0%	0.1%	100%
Total	93	16,639	5,685	48	1,619	287	0	64	658	59	48	6	75	25,281
Percent	0.4%	65.8%	22.5%	0.2%	6.4%	1.1%	0.0%	0.3%	2.6%	0.2%	0.2%	0.0%	0.3%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O Algen Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 04

Thursday, November 9, 2017
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	60	16	0	4	2	0	0	10	0	2	0	0	**94**
1:00 AM	0	22	12	0	3	0	0	0	12	0	1	0	0	**50**
2:00 AM	2	47	9	1	4	2	0	0	12	0	0	0	0	**77**
3:00 AM	0	93	33	2	5	2	0	1	7	1	0	0	0	**144**
4:00 AM	0	101	33	2	20	1	0	1	10	1	2	0	0	**171**
5:00 AM	0	200	92	1	25	3	0	1	20	3	0	0	0	**345**
6:00 AM	3	376	117	1	47	7	0	3	17	0	1	0	2	**574**
7:00 AM	2	602	175	1	56	6	0	2	22	1	0	0	2	**869**
8:00 AM	0	585	171	2	58	12	0	1	19	2	0	0	0	**850**
9:00 AM	1	389	154	1	50	14	0	5	22	0	2	0	2	**640**
10:00 AM	4	435	159	3	63	11	0	2	11	1	1	0	1	**691**
11:00 AM	4	494	176	1	42	11	0	2	19	1	0	2	0	**752**
12:00 PM	3	544	179	0	63	9	0	2	22	3	2	1	1	**829**
1:00 PM	5	554	187	3	53	10	0	3	23	2	3	1	0	**844**
2:00 PM	0	620	211	1	47	9	0	4	21	0	0	1	1	**915**
3:00 PM	1	586	209	0	58	1	0	3	16	1	3	0	0	**878**
4:00 PM	3	571	220	2	51	8	0	1	9	0	2	0	0	**867**
5:00 PM	1	619	199	1	37	6	0	1	13	2	1	0	0	**880**
6:00 PM	2	497	142	0	26	9	0	1	15	0	3	0	2	**697**
7:00 PM	1	371	109	0	21	4	0	0	12	0	1	0	0	**519**
8:00 PM	3	273	64	0	20	3	0	1	18	1	1	0	1	**385**
9:00 PM	1	227	58	0	6	2	0	0	8	1	1	0	1	**305**
10:00 PM	0	197	33	1	6	4	0	0	14	1	0	0	1	**257**
11:00 PM	0	119	31	0	8	2	0	0	8	0	1	0	0	**169**
Total	**36**	**8,582**	**2,789**	**23**	**773**	**138**	**0**	**34**	**360**	**21**	**27**	**5**	**14**	**12,802**
Percent	**0.3%**	**67.0%**	**21.8%**	**0.2%**	**6.0%**	**1.1%**	**0.0%**	**0.3%**	**2.8%**	**0.2%**	**0.2%**	**0.0%**	**0.1%**	

Location: Crows Landing Rd N/O Algen Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 04

DATA SOLUTIONS

Total Study Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	63	9	0	3	0	0	0	6	0	0	0	0	**81**
1:00 AM	0	32	10	2	5	0	0	0	5	0	0	0	0	**54**
2:00 AM	0	32	15	2	4	3	0	0	11	0	2	0	0	**69**
3:00 AM	2	47	16	2	8	2	0	1	9	0	0	0	0	**87**
4:00 AM	0	87	29	2	17	7	0	0	10	1	4	0	0	**157**
5:00 AM	3	158	59	1	18	12	0	3	17	0	3	0	2	**276**
6:00 AM	1	228	93	4	25	13	0	3	27	1	2	0	4	**401**
7:00 AM	6	434	160	3	60	8	0	4	26	1	1	0	3	**706**
8:00 AM	2	531	209	4	85	11	0	0	11	4	0	0	7	**864**
9:00 AM	2	475	177	1	57	9	0	3	20	2	3	0	3	**752**
10:00 AM	4	422	175	1	61	14	0	0	24	3	2	0	3	**709**
11:00 AM	9	478	229	1	50	10	0	1	10	3	1	0	7	**799**
12:00 PM	3	512	206	0	48	10	0	3	14	4	0	0	2	**802**
1:00 PM	4	469	177	0	56	4	0	3	18	1	1	0	6	**739**
2:00 PM	4	550	216	2	46	10	0	1	15	2	0	0	1	**847**
3:00 PM	3	679	231	0	64	3	0	0	12	4	2	0	8	**1,006**
4:00 PM	3	709	257	0	76	8	0	2	9	3	0	1	4	**1,072**
5:00 PM	5	762	221	0	46	5	0	2	5	5	0	0	6	**1,057**
6:00 PM	5	483	146	0	41	5	0	1	6	1	0	0	2	**690**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	1	218	75	0	15	2	0	1	6	1	0	0	0	**319**
9:00 PM	0	180	50	0	18	5	0	1	12	0	0	0	1	**267**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	0	95	26	0	12	2	0	0	10	2	0	0	0	**147**
Total	**57**	**7,644**	**2,786**	**25**	**815**	**143**	**0**	**29**	**283**	**38**	**21**	**1**	**59**	**11,901**
Percent	**0.5%**	**64.2%**	**23.4%**	**0.2%**	**6.8%**	**1.2%**	**0.0%**	**0.2%**	**2.4%**	**0.3%**	**0.2%**	**0.0%**	**0.5%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O Algen Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 04

Total Study Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	60	16	0	4	2	0	0	10	0	2	0	0	**94**
1:00 AM	0	22	12	0	3	0	0	0	12	0	1	0	0	**50**
2:00 AM	2	47	9	1	4	2	0	0	12	0	0	0	0	**77**
3:00 AM	0	93	33	2	5	2	0	1	7	1	0	0	0	**144**
4:00 AM	0	101	33	2	20	1	0	1	10	1	2	0	0	**171**
5:00 AM	0	200	92	1	25	3	0	1	20	3	0	0	0	**345**
6:00 AM	3	376	117	1	47	7	0	3	17	0	1	0	2	**574**
7:00 AM	2	602	175	1	56	6	0	2	22	1	0	0	2	**869**
8:00 AM	0	585	171	2	58	12	0	1	19	2	0	0	0	**850**
9:00 AM	1	389	154	1	50	14	0	5	22	0	2	0	2	**640**
10:00 AM	4	435	159	3	63	11	0	2	11	1	1	0	1	**691**
11:00 AM	4	494	176	1	42	11	0	2	19	1	0	2	0	**752**
12:00 PM	3	544	179	0	63	9	0	2	22	3	2	1	1	**829**
1:00 PM	5	554	187	3	53	10	0	3	23	2	3	1	0	**844**
2:00 PM	0	620	211	1	47	9	0	4	21	0	0	1	1	**915**
3:00 PM	1	586	209	0	58	1	0	3	16	1	3	0	0	**878**
4:00 PM	3	571	220	2	51	8	0	1	9	0	2	0	0	**867**
5:00 PM	1	619	199	1	37	6	0	1	13	2	1	0	0	**880**
6:00 PM	2	497	142	0	26	9	0	1	15	0	3	0	2	**697**
7:00 PM	1	371	109	0	21	4	0	0	12	0	1	0	0	**519**
8:00 PM	3	273	64	0	20	3	0	1	18	1	1	0	1	**385**
9:00 PM	1	227	58	0	6	2	0	0	8	1	1	0	1	**305**
10:00 PM	0	197	33	1	6	4	0	0	14	1	0	0	1	**257**
11:00 PM	0	119	31	0	8	2	0	0	8	0	1	0	0	**169**
Total	**36**	**8,582**	**2,789**	**23**	**773**	**138**	**0**	**34**	**360**	**21**	**27**	**5**	**14**	**12,802**
Percent	**0.3%**	**67.0%**	**21.8%**	**0.2%**	**6.0%**	**1.1%**	**0.0%**	**0.3%**	**2.8%**	**0.2%**	**0.2%**	**0.0%**	**0.1%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O Algen Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 04

3-Day (Tuesday - Thursday) Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	63	9	0	3	0	0	0	6	0	0	0	0	**81**
1:00 AM	0	32	10	2	5	0	0	0	5	0	0	0	0	**54**
2:00 AM	0	32	15	2	4	3	0	0	11	0	2	0	0	**69**
3:00 AM	2	47	16	2	8	2	0	1	9	0	0	0	0	**87**
4:00 AM	0	87	29	2	17	7	0	0	10	1	4	0	0	**157**
5:00 AM	3	158	59	1	18	12	0	3	17	0	3	0	2	**276**
6:00 AM	1	228	93	4	25	13	0	3	27	1	2	0	4	**401**
7:00 AM	6	434	160	3	60	8	0	4	26	1	1	0	3	**706**
8:00 AM	2	531	209	4	85	11	0	0	11	4	0	0	7	**864**
9:00 AM	2	475	177	1	57	9	0	3	20	2	3	0	3	**752**
10:00 AM	4	422	175	1	61	14	0	0	24	3	2	0	3	**709**
11:00 AM	9	478	229	1	50	10	0	1	10	3	1	0	7	**799**
12:00 PM	3	512	206	0	48	10	0	3	14	4	0	0	2	**802**
1:00 PM	4	469	177	0	56	4	0	3	18	1	1	0	6	**739**
2:00 PM	4	550	216	2	46	10	0	1	15	2	0	0	1	**847**
3:00 PM	3	679	231	0	64	3	0	0	12	4	2	0	8	**1,006**
4:00 PM	3	709	257	0	76	8	0	2	9	3	0	1	4	**1,072**
5:00 PM	5	762	221	0	46	5	0	2	5	5	0	0	6	**1,057**
6:00 PM	5	483	146	0	41	5	0	1	6	1	0	0	2	**690**
7:00 PM	0	297	89	0	21	3	0	1	5	0	0	0	2	**418**
8:00 PM	1	218	75	0	15	2	0	1	6	1	0	0	0	**319**
9:00 PM	0	180	50	0	18	5	0	1	12	0	0	0	1	**267**
10:00 PM	0	116	21	0	10	3	0	0	10	0	0	0	0	**160**
11:00 PM	0	95	26	0	12	2	0	0	10	2	0	0	0	**147**
Total	**57**	**8,057**	**2,896**	**25**	**846**	**149**	**0**	**30**	**298**	**38**	**21**	**1**	**61**	**12,479**
Percent	**0.5%**	**64.6%**	**23.2%**	**0.2%**	**6.8%**	**1.2%**	**0.0%**	**0.2%**	**2.4%**	**0.3%**	**0.2%**	**0.0%**	**0.5%**	

Location: Crows Landing Rd N/O Algen Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 04

3-Day (Tuesday - Thursday) Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	60	16	0	4	2	0	0	10	0	2	0	0	**94**
1:00 AM	0	22	12	0	3	0	0	0	12	0	1	0	0	**50**
2:00 AM	2	47	9	1	4	2	0	0	12	0	0	0	0	**77**
3:00 AM	0	93	33	2	5	2	0	1	7	1	0	0	0	**144**
4:00 AM	0	101	33	2	20	1	0	1	10	1	2	0	0	**171**
5:00 AM	0	200	92	1	25	3	0	1	20	3	0	0	0	**345**
6:00 AM	3	376	117	1	47	7	0	3	17	0	1	0	2	**574**
7:00 AM	2	602	175	1	56	6	0	2	22	1	0	0	2	**869**
8:00 AM	0	585	171	2	58	12	0	1	19	2	0	0	0	**850**
9:00 AM	1	389	154	1	50	14	0	5	22	0	2	0	2	**640**
10:00 AM	4	435	159	3	63	11	0	2	11	1	1	0	1	**691**
11:00 AM	4	494	176	1	42	11	0	2	19	1	0	2	0	**752**
12:00 PM	3	544	179	0	63	9	0	2	22	3	2	1	1	**829**
1:00 PM	5	554	187	3	53	10	0	3	23	2	3	1	0	**844**
2:00 PM	0	620	211	1	47	9	0	4	21	0	0	1	1	**915**
3:00 PM	1	586	209	0	58	1	0	3	16	1	3	0	0	**878**
4:00 PM	3	571	220	2	51	8	0	1	9	0	2	0	0	**867**
5:00 PM	1	619	199	1	37	6	0	1	13	2	1	0	0	**880**
6:00 PM	2	497	142	0	26	9	0	1	15	0	3	0	2	**697**
7:00 PM	1	371	109	0	21	4	0	0	12	0	1	0	0	**519**
8:00 PM	3	273	64	0	20	3	0	1	18	1	1	0	1	**385**
9:00 PM	1	227	58	0	6	2	0	0	8	1	1	0	1	**305**
10:00 PM	0	197	33	1	6	4	0	0	14	1	0	0	1	**257**
11:00 PM	0	119	31	0	8	2	0	0	8	0	1	0	0	**169**
Total	**36**	**8,582**	**2,789**	**23**	**773**	**138**	**0**	**34**	**360**	**21**	**27**	**5**	**14**	**12,802**
Percent	**0.3%**	**67.0%**	**21.8%**	**0.2%**	**6.0%**	**1.1%**	**0.0%**	**0.3%**	**2.8%**	**0.2%**	**0.2%**	**0.0%**	**0.1%**	

Vehicle Classification Report Summary

Location: Crows Landing Rd N/O E Whitmore Ave

Count Direction: Northbound / Southbound

Date Range: 11/9/2017 to 11/9/2017

Site Code: 05

	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
	Study Total													
Northbound	58	8,132	2,713	15	738	146	0	33	269	42	14	3	71	12,234
Percent	0.5%	66.5%	22.2%	0.1%	6.0%	1.2%	0.0%	0.3%	2.2%	0.3%	0.1%	0.0%	0.6%	100%
Southbound	90	8,366	2,658	29	695	394	0	20	226	76	18	2	86	12,660
Percent	0.7%	66.1%	21.0%	0.2%	5.5%	3.1%	0.0%	0.2%	1.8%	0.6%	0.1%	0.0%	0.7%	100%
Total	148	16,498	5,371	44	1,433	540	0	53	495	118	32	5	157	24,894
Percent	0.6%	66.3%	21.6%	0.2%	5.8%	2.2%	0.0%	0.2%	2.0%	0.5%	0.1%	0.0%	0.6%	100%

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Location: **Crows Landing Rd N/O E Whitmore Ave**
Date Range: **11/9/2017 to 11/9/2017**
Site Code: **05**

Thursday, November 9, 2017
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	50	15	0	3	5	0	1	8	0	1	0	2	**85**
1:00 AM	1	26	13	0	3	0	0	0	9	3	1	0	0	**56**
2:00 AM	1	41	11	3	1	5	0	0	10	3	0	0	1	**76**
3:00 AM	0	87	26	2	6	10	0	1	6	0	0	0	4	**142**
4:00 AM	0	88	42	1	11	10	0	0	7	3	2	0	1	**165**
5:00 AM	1	178	96	1	28	8	0	0	13	2	0	0	5	**332**
6:00 AM	4	391	111	2	44	32	0	1	11	5	1	0	1	**603**
7:00 AM	7	580	174	3	63	35	0	2	17	8	0	0	4	**893**
8:00 AM	8	537	184	1	68	22	0	1	11	2	0	0	2	**836**
9:00 AM	6	370	149	1	39	24	0	5	9	7	2	0	7	**619**
10:00 AM	3	384	157	2	58	19	0	3	10	2	0	0	5	**643**
11:00 AM	7	441	172	3	58	21	0	0	7	3	0	1	4	**717**
12:00 PM	9	492	160	0	63	23	0	1	10	4	0	0	9	**771**
1:00 PM	2	557	168	4	33	24	0	1	9	4	3	1	12	**818**
2:00 PM	7	650	193	0	34	23	0	1	13	6	1	0	7	**935**
3:00 PM	3	605	188	2	46	17	0	0	11	3	1	0	3	**879**
4:00 PM	7	594	199	1	44	33	0	2	2	5	1	0	1	**889**
5:00 PM	12	636	182	2	33	16	0	1	6	6	1	0	5	**900**
6:00 PM	5	494	149	0	27	17	0	0	11	3	2	0	2	**710**
7:00 PM	1	360	95	0	16	13	0	0	8	2	0	0	2	**497**
8:00 PM	2	267	65	0	10	13	0	0	13	1	1	0	4	**376**
9:00 PM	3	235	46	0	3	10	0	0	5	1	0	0	2	**305**
10:00 PM	1	188	34	1	3	7	0	0	11	3	0	0	1	**249**
11:00 PM	0	115	29	0	1	7	0	0	9	0	1	0	2	**164**
Total	**90**	**8,366**	**2,658**	**29**	**695**	**394**	**0**	**20**	**226**	**76**	**18**	**2**	**86**	**12,660**
Percent	**0.7%**	**66.1%**	**21.0%**	**0.2%**	**5.5%**	**3.1%**	**0.0%**	**0.2%**	**1.8%**	**0.6%**	**0.1%**	**0.0%**	**0.7%**	

Location: Crows Landing Rd N/O E Whitmore Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 05

Total Study Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	67	8	0	4	0	0	0	6	0	0	0	0	**85**
1:00 AM	1	44	9	0	8	0	0	0	5	0	0	0	0	**67**
2:00 AM	1	43	13	2	3	2	0	0	9	0	1	0	1	**75**
3:00 AM	2	54	15	1	14	2	0	1	5	0	0	0	1	**95**
4:00 AM	1	95	30	0	22	4	0	0	15	0	3	1	0	**171**
5:00 AM	0	162	79	1	27	4	0	1	20	0	2	0	1	**297**
6:00 AM	3	235	99	2	39	7	0	2	23	1	0	0	7	**418**
7:00 AM	4	461	133	1	53	12	0	2	20	7	0	0	7	**700**
8:00 AM	1	545	205	2	94	3	0	0	10	3	1	1	8	**873**
9:00 AM	5	435	161	1	51	5	0	2	16	4	2	0	4	**686**
10:00 AM	4	410	164	1	51	10	0	3	17	6	1	1	6	**674**
11:00 AM	3	491	198	1	37	15	0	5	13	5	1	0	4	**773**
12:00 PM	5	537	187	0	37	12	0	2	12	3	0	0	3	**798**
1:00 PM	4	492	156	1	46	8	0	4	10	0	2	0	10	**733**
2:00 PM	3	548	188	1	40	13	0	2	9	2	0	0	3	**809**
3:00 PM	3	644	224	1	45	9	0	1	15	3	1	0	2	**948**
4:00 PM	3	680	246	0	43	8	0	0	6	2	0	0	8	**996**
5:00 PM	6	735	200	0	51	10	0	4	7	4	0	0	3	**1,020**
6:00 PM	2	457	137	0	31	4	0	3	5	1	0	0	1	**641**
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 PM	2	237	67	0	12	1	0	0	4	1	0	0	0	**324**
9:00 PM	3	217	48	0	14	3	0	0	14	0	0	0	0	**299**
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
11:00 PM	1	123	25	0	0	6	0	0	11	0	0	0	0	**166**
Total	**57**	**7,712**	**2,592**	**15**	**722**	**138**	**0**	**32**	**252**	**42**	**14**	**3**	**69**	**11,648**
Percent	**0.5%**	**66.2%**	**22.3%**	**0.1%**	**6.2%**	**1.2%**	**0.0%**	**0.3%**	**2.2%**	**0.4%**	**0.1%**	**0.0%**	**0.6%**	

Note: Average only condsidered on days with 24-hours of data.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O E Whitmore Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 05

Total Study Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	50	15	0	3	5	0	1	8	0	1	0	2	85
1:00 AM	1	26	13	0	3	0	0	0	9	3	1	0	0	56
2:00 AM	1	41	11	3	1	5	0	0	10	3	0	0	1	76
3:00 AM	0	87	26	2	6	10	0	1	6	0	0	0	4	142
4:00 AM	0	88	42	1	11	10	0	0	7	3	2	0	1	165
5:00 AM	1	178	96	1	28	8	0	0	13	2	0	0	5	332
6:00 AM	4	391	111	2	44	32	0	1	11	5	1	0	1	603
7:00 AM	7	580	174	3	63	35	0	2	17	8	0	0	4	893
8:00 AM	8	537	184	1	68	22	0	1	11	2	0	0	2	836
9:00 AM	6	370	149	1	39	24	0	5	9	7	2	0	7	619
10:00 AM	3	384	157	2	58	19	0	3	10	2	0	0	5	643
11:00 AM	7	441	172	3	58	21	0	0	7	3	0	1	4	717
12:00 PM	9	492	160	0	63	23	0	1	10	4	0	0	9	771
1:00 PM	2	557	168	4	33	24	0	1	9	4	3	1	12	818
2:00 PM	7	650	193	0	34	23	0	1	13	6	1	0	7	935
3:00 PM	3	605	188	2	46	17	0	0	11	3	1	0	3	879
4:00 PM	7	594	199	1	44	33	0	2	2	5	1	0	1	889
5:00 PM	12	636	182	2	33	16	0	1	6	6	1	0	5	900
6:00 PM	5	494	149	0	27	17	0	0	11	3	2	0	2	710
7:00 PM	1	360	95	0	16	13	0	0	8	2	0	0	2	497
8:00 PM	2	267	65	0	10	13	0	0	13	1	1	0	4	376
9:00 PM	3	235	46	0	3	10	0	0	5	1	0	0	2	305
10:00 PM	1	188	34	1	3	7	0	0	11	3	0	0	1	249
11:00 PM	0	115	29	0	1	7	0	0	9	0	1	0	2	164
Total	**90**	**8,366**	**2,658**	**29**	**695**	**394**	**0**	**20**	**226**	**76**	**18**	**2**	**86**	**12,660**
Percent	**0.7%**	**66.1%**	**21.0%**	**0.2%**	**5.5%**	**3.1%**	**0.0%**	**0.2%**	**1.8%**	**0.6%**	**0.1%**	**0.0%**	**0.7%**	

Note: Average only condsidered on days with 24-hours of data.

Location: Crows Landing Rd N/O E Whitmore Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 05

3-Day (Tuesday - Thursday) Average
Northbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	67	8	0	4	0	0	0	6	0	0	0	0	**85**
1:00 AM	1	44	9	0	8	0	0	0	5	0	0	0	0	**67**
2:00 AM	1	43	13	2	3	2	0	0	9	0	1	0	1	**75**
3:00 AM	2	54	15	1	14	2	0	1	5	0	0	0	1	**95**
4:00 AM	1	95	30	0	22	4	0	0	15	0	3	1	0	**171**
5:00 AM	0	162	79	1	27	4	0	1	20	0	2	0	1	**297**
6:00 AM	3	235	99	2	39	7	0	2	23	1	0	0	7	**418**
7:00 AM	4	461	133	1	53	12	0	2	20	7	0	0	7	**700**
8:00 AM	1	545	205	2	94	3	0	0	10	3	1	1	8	**873**
9:00 AM	5	435	161	1	51	5	0	2	16	4	2	0	4	**686**
10:00 AM	4	410	164	1	51	10	0	3	17	6	1	1	6	**674**
11:00 AM	3	491	198	1	37	15	0	5	13	5	1	0	4	**773**
12:00 PM	5	537	187	0	37	12	0	2	12	3	0	0	3	**798**
1:00 PM	4	492	156	1	46	8	0	4	10	0	2	0	10	**733**
2:00 PM	3	548	188	1	40	13	0	2	9	2	0	0	3	**809**
3:00 PM	3	644	224	1	45	9	0	1	15	3	1	0	2	**948**
4:00 PM	3	680	246	0	43	8	0	0	6	2	0	0	8	**996**
5:00 PM	6	735	200	0	51	10	0	4	7	4	0	0	3	**1,020**
6:00 PM	2	457	137	0	31	4	0	3	5	1	0	0	1	**641**
7:00 PM	1	296	103	0	12	4	0	1	7	0	0	0	2	**426**
8:00 PM	2	237	67	0	12	1	0	0	4	1	0	0	0	**324**
9:00 PM	3	217	48	0	14	3	0	0	14	0	0	0	0	**299**
10:00 PM	0	124	18	0	4	4	0	0	10	0	0	0	0	**160**
11:00 PM	1	123	25	0	0	6	0	0	11	0	0	0	0	**166**
Total	**58**	**8,132**	**2,713**	**15**	**738**	**146**	**0**	**33**	**269**	**42**	**14**	**3**	**71**	**12,234**
Percent	**0.5%**	**66.5%**	**22.2%**	**0.1%**	**6.0%**	**1.2%**	**0.0%**	**0.3%**	**2.2%**	**0.3%**	**0.1%**	**0.0%**	**0.6%**	

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Crows Landing Rd N/O E Whitmore Ave
Date Range: 11/9/2017 to 11/9/2017
Site Code: 05

3-Day (Tuesday - Thursday) Average
Southbound

Time	FHWA Vehicle Classification													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
12:00 AM	0	50	15	0	3	5	0	1	8	0	1	0	2	**85**
1:00 AM	1	26	13	0	3	0	0	0	9	3	1	0	0	**56**
2:00 AM	1	41	11	3	1	5	0	0	10	3	0	0	1	**76**
3:00 AM	0	87	26	2	6	10	0	1	6	0	0	0	4	**142**
4:00 AM	0	88	42	1	11	10	0	0	7	3	2	0	1	**165**
5:00 AM	1	178	96	1	28	8	0	0	13	2	0	0	5	**332**
6:00 AM	4	391	111	2	44	32	0	1	11	5	1	0	1	**603**
7:00 AM	7	580	174	3	63	35	0	2	17	8	0	0	4	**893**
8:00 AM	8	537	184	1	68	22	0	1	11	2	0	0	2	**836**
9:00 AM	6	370	149	1	39	24	0	5	9	7	2	0	7	**619**
10:00 AM	3	384	157	2	58	19	0	3	10	2	0	0	5	**643**
11:00 AM	7	441	172	3	58	21	0	0	7	3	0	1	4	**717**
12:00 PM	9	492	160	0	63	23	0	1	10	4	0	0	9	**771**
1:00 PM	2	557	168	4	33	24	0	1	9	4	3	1	12	**818**
2:00 PM	7	650	193	0	34	23	0	1	13	6	1	0	7	**935**
3:00 PM	3	605	188	2	46	17	0	0	11	3	1	0	3	**879**
4:00 PM	7	594	199	1	44	33	0	2	2	5	1	0	1	**889**
5:00 PM	12	636	182	2	33	16	0	1	6	6	1	0	5	**900**
6:00 PM	5	494	149	0	27	17	0	0	11	3	2	0	2	**710**
7:00 PM	1	360	95	0	16	13	0	0	8	2	0	0	2	**497**
8:00 PM	2	267	65	0	10	13	0	0	13	1	1	0	4	**376**
9:00 PM	3	235	46	0	3	10	0	0	5	1	0	0	2	**305**
10:00 PM	1	188	34	1	3	7	0	0	11	3	0	0	1	**249**
11:00 PM	0	115	29	0	1	7	0	0	9	0	1	0	2	**164**
Total	**90**	**8,366**	**2,658**	**29**	**695**	**394**	**0**	**20**	**226**	**76**	**18**	**2**	**86**	**12,660**
Percent	**0.7%**	**66.1%**	**21.0%**	**0.2%**	**5.5%**	**3.1%**	**0.0%**	**0.2%**	**1.8%**	**0.6%**	**0.1%**	**0.0%**	**0.7%**	

Appendix C – Existing Conditions Intersection Level of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	425	245	66	153	177	31	90	727	102	41	901	217
Future Volume (vph)	425	245	66	153	177	31	90	727	102	41	901	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3162		1564	3207		1719	3438	1500	1719	3438	1503
Flt Permitted	0.95	0.98		0.95	0.99		0.10	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1564	3162		1564	3207		181	3438	1500	452	3438	1503
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	478	275	74	194	224	39	95	765	107	45	990	238
RTOR Reduction (vph)	0	8	0	0	8	0	0	0	55	0	0	106
Lane Group Flow (vph)	272	547	0	149	300	0	95	765	52	45	990	132
Confl. Peds. (#/hr)			4						10			9
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	28.3	28.3		18.7	18.7		54.2	44.9	44.9	47.8	41.7	41.7
Effective Green, g (s)	28.3	28.3		18.7	18.7		54.2	44.9	44.9	47.8	41.7	41.7
Actuated g/C Ratio	0.24	0.24		0.16	0.16		0.46	0.38	0.38	0.40	0.35	0.35
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	374	757		247	507		204	1305	569	248	1212	530
v/s Ratio Prot	c0.17	0.17		c0.10	0.09		c0.04	0.22		0.01	c0.29	
v/s Ratio Perm							0.18		0.03	0.06		0.09
v/c Ratio	0.73	0.72		0.60	0.59		0.47	0.59	0.09	0.18	0.82	0.25
Uniform Delay, d1	41.4	41.3		46.3	46.2		22.8	29.2	23.5	22.3	34.8	27.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	3.7		4.7	2.2		1.7	0.8	0.1	0.4	4.6	0.3
Delay (s)	48.8	45.0		51.0	48.4		24.5	30.0	23.6	22.6	39.4	27.5
Level of Service	D	D		D	D		C	C	C	C	D	C
Approach Delay (s)		46.2			49.3			28.8			36.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	20.2
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	1	2	0	17	0	952	15	10	1059	7
Future Volume (Veh/h)	8	0	1	2	0	17	0	952	15	10	1059	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.53	0.53	0.53	0.93	0.93	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	11	0	1	4	0	32	0	1024	16	11	1177	8
Pedestrians		4			9							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)								887			461	
pX, platoon unblocked	0.77	0.77	0.74	0.77	0.77	0.95	0.74			0.95		
vC, conflicting volume	1751	2256	596	1652	2252	529	1189			1049		
vC1, stage 1 conf vol	1207	1207		1041	1041							
vC2, stage 2 conf vol	544	1049		612	1211							
vCu, unblocked vol	1085	1744	0	957	1739	403	560			949		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	96	100	100	98	100	94	100			98		
cM capacity (veh/h)	288	230	792	251	235	553	724			655		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	12	36	683	357	11	785	400
Volume Left	11	4	0	0	11	0	0
Volume Right	1	32	0	16	0	0	8
cSH	304	488	1700	1700	655	1700	1700
Volume to Capacity	0.04	0.07	0.40	0.21	0.02	0.46	0.24
Queue Length 95th (ft)	3	6	0	0	1	0	0
Control Delay (s)	17.3	13.0	0.0	0.0	10.6	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	17.3	13.0	0.0		0.1		
Approach LOS	C	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	0	14	0	0	0	4	699	0	0	902	28
Future Volume (Veh/h)	31	0	14	0	0	0	4	699	0	0	902	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	35	0	16	0	0	0	4	785	0	0	1013	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								680			668	
pX, platoon unblocked	0.79	0.79	0.76	0.79	0.79	0.94	0.76			0.94		
vC, conflicting volume	1429	1822	522	1316	1837	392	1044			785		
vC1, stage 1 conf vol	1028	1028		793	793							
vC2, stage 2 conf vol	400	793		522	1044							
vCu, unblocked vol	645	1141	0	501	1161	213	419			632		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	98	100	100	100	100			100		
cM capacity (veh/h)	425	341	822	390	335	741	861			885		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	51	0	4	392	392	675	369
Volume Left	35	0	4	0	0	0	0
Volume Right	16	0	0	0	0	0	31
cSH	501	1700	861	1700	1700	1700	1700
Volume to Capacity	0.10	0.00	0.00	0.23	0.23	0.40	0.22
Queue Length 95th (ft)	8	0	0	0	0	0	0
Control Delay (s)	13.0	0.0	9.2	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	13.0	0.0	0.0			0.0	
Approach LOS	B	A					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	27	41	2	17	1	28	775	4	0	908	75
Future Volume (vph)	111	27	41	2	17	1	28	775	4	0	908	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	5.5			5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00			1.00	
Frt		0.97			0.99		1.00	1.00			0.99	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1676			1767		1703	3403			4827	
Flt Permitted		0.79			0.97		0.95	1.00			1.00	
Satd. Flow (perm)		1365			1718		1703	3403			4827	
Peak-hour factor, PHF	0.91	0.91	0.91	0.56	0.56	0.56	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	30	45	4	30	2	30	842	4	0	987	82
RTOR Reduction (vph)	0	17	0	0	2	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	180	0	0	34	0	30	846	0	0	1061	0
Confl. Peds. (#/hr)	9					9			3			3
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4								
Actuated Green, G (s)		15.7			15.7		2.0	54.3			47.8	
Effective Green, g (s)		15.7			15.7		2.0	54.3			47.8	
Actuated g/C Ratio		0.20			0.20		0.02	0.68			0.60	
Clearance Time (s)		4.5			4.5		4.5	5.5			5.5	
Vehicle Extension (s)		3.0			3.0		3.0	4.5			4.5	
Lane Grp Cap (vph)		267			337		42	2309			2884	
v/s Ratio Prot							c0.02	c0.25			0.22	
v/s Ratio Perm		c0.13			0.02							
v/c Ratio		0.67			0.10		0.71	0.37			0.37	
Uniform Delay, d1		29.8			26.4		38.7	5.5			8.3	
Progression Factor		1.00			1.00		1.09	0.89			1.00	
Incremental Delay, d2		6.6			0.1		42.6	0.4			0.4	
Delay (s)		36.4			26.5		85.0	5.3			8.7	
Level of Service		D			C		F	A			A	
Approach Delay (s)		36.4			26.5			8.0			8.7	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	109	40	775	112	48	894
Future Volume (vph)	109	40	775	112	48	894
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		5.5		4.5	5.5
Lane Util. Factor	1.00		0.91		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.96		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1666		4786		1703	3406
Flt Permitted	0.96		1.00		0.95	1.00
Satd. Flow (perm)	1666		4786		1703	3406
Peak-hour factor, PHF	0.65	0.65	0.94	0.94	0.92	0.92
Adj. Flow (vph)	168	62	824	119	52	972
RTOR Reduction (vph)	19	0	17	0	0	0
Lane Group Flow (vph)	211	0	926	0	52	972
Confl. Peds. (#/hr)				2		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	15.3		45.0		5.2	54.7
Effective Green, g (s)	15.3		45.0		5.2	54.7
Actuated g/C Ratio	0.19		0.56		0.07	0.68
Clearance Time (s)	4.5		5.5		4.5	5.5
Vehicle Extension (s)	3.0		4.5		3.0	4.5
Lane Grp Cap (vph)	318		2692		110	2328
v/s Ratio Prot	c0.13		0.19		0.03	c0.29
v/s Ratio Perm						
v/c Ratio	0.66		0.34		0.47	0.42
Uniform Delay, d1	30.0		9.5		36.1	5.6
Progression Factor	1.00		1.00		0.82	0.44
Incremental Delay, d2	5.1		0.4		3.0	0.5
Delay (s)	35.1		9.8		32.8	3.0
Level of Service	D		A		C	A
Approach Delay (s)	35.1		9.8			4.5
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	14	23	890	964	11
Future Volume (Veh/h)	5	14	23	890	964	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	15	24	937	1015	12
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					760	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1538	514	1028			
vC1, stage 1 conf vol	1022					
vC2, stage 2 conf vol	516					
vCu, unblocked vol	1373	232	804			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4	2.3			
p0 queue free %	98	98	97			
cM capacity (veh/h)	305	680	709			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	20	24	468	468	677	350
Volume Left	5	24	0	0	0	0
Volume Right	15	0	0	0	0	12
cSH	520	709	1700	1700	1700	1700
Volume to Capacity	0.04	0.03	0.28	0.28	0.40	0.21
Queue Length 95th (ft)	3	3	0	0	0	0
Control Delay (s)	12.2	10.3	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	12.2	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	7	12	0	0	0	18	645	7	13	849	13
Future Volume (Veh/h)	13	7	12	0	0	0	18	645	7	13	849	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	8	13	0	0	0	20	717	8	14	943	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1160	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	1376	1743	478	1278	1746	362	957			725		
vC1, stage 1 conf vol	978	978		761	761							
vC2, stage 2 conf vol	398	765		516	985							
vCu, unblocked vol	1279	1668	327	1174	1671	362	835			725		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	97	98	100	100	100	97			98		
cM capacity (veh/h)	270	265	631	309	259	634	750			874		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	35	0	20	478	247	14	629	328
Volume Left	14	0	20	0	0	14	0	0
Volume Right	13	0	0	0	8	0	0	14
cSH	341	1700	750	1700	1700	874	1700	1700
Volume to Capacity	0.10	0.00	0.03	0.28	0.15	0.02	0.37	0.19
Queue Length 95th (ft)	9	0	2	0	0	1	0	0
Control Delay (s)	16.8	0.0	9.9	0.0	0.0	9.2	0.0	0.0
Lane LOS	C	A	A			A		
Approach Delay (s)	16.8	0.0	0.3			0.1		
Approach LOS	C	A						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	27	20	651	844	21
Future Volume (Veh/h)	17	27	20	651	844	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	29	22	708	917	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1326	470	940			
vC1, stage 1 conf vol	928					
vC2, stage 2 conf vol	398					
vCu, unblocked vol	1326	470	940			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	95	97			
cM capacity (veh/h)	315	540	725			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	47	22	354	354	611	329
Volume Left	18	22	0	0	0	0
Volume Right	29	0	0	0	0	23
cSH	424	725	1700	1700	1700	1700
Volume to Capacity	0.11	0.03	0.21	0.21	0.36	0.19
Queue Length 95th (ft)	9	2	0	0	0	0
Control Delay (s)	14.5	10.1	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.5	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	27	23	891	936	10
Future Volume (Veh/h)	28	27	23	891	936	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	30	29	24	948	996	11
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1528	508	1011			
vC1, stage 1 conf vol	1006					
vC2, stage 2 conf vol	522					
vCu, unblocked vol	1528	508	1011			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4	2.3			
p0 queue free %	89	94	96			
cM capacity (veh/h)	270	498	655			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	59	24	474	474	664	343
Volume Left	30	24	0	0	0	0
Volume Right	29	0	0	0	0	11
cSH	349	655	1700	1700	1700	1700
Volume to Capacity	0.17	0.04	0.28	0.28	0.39	0.20
Queue Length 95th (ft)	15	3	0	0	0	0
Control Delay (s)	17.4	10.7	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	17.4	0.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	15	1	0	43	5	833	10	37	872	55
Future Volume (Veh/h)	38	0	15	1	0	43	5	833	10	37	872	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	41	0	16	1	0	46	5	896	11	40	938	59
Pedestrians		4			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								910				
pX, platoon unblocked	0.88	0.88		0.88	0.88	0.88				0.88		
vC, conflicting volume	1556	1972	502	1480	1996	458	1001			911		
vC1, stage 1 conf vol	1052	1052		916	916							
vC2, stage 2 conf vol	504	921		565	1081							
vCu, unblocked vol	1353	1828	502	1267	1856	101	1001			618		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	81	100	97	100	100	94	99			95		
cM capacity (veh/h)	211	222	502	290	221	806	661			814		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	57	47	5	597	310	40	625	372
Volume Left	41	1	5	0	0	40	0	0
Volume Right	16	46	0	0	11	0	0	59
cSH	252	776	661	1700	1700	814	1700	1700
Volume to Capacity	0.23	0.06	0.01	0.35	0.18	0.05	0.37	0.22
Queue Length 95th (ft)	21	5	1	0	0	4	0	0
Control Delay (s)	23.4	9.9	10.5	0.0	0.0	9.7	0.0	0.0
Lane LOS	C	A	B			A		
Approach Delay (s)	23.4	9.9	0.1			0.4		
Approach LOS	C	A						

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	209	87	136	182	239	50	505	52	203	583	108
Future Volume (vph)	138	209	87	136	182	239	50	505	52	203	583	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1721		1719	1642		1719	3380		1719	3345	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1721		1719	1642		1719	3380		1719	3345	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	147	222	93	145	194	254	53	537	55	216	620	115
RTOR Reduction (vph)	0	20	0	0	59	0	0	10	0	0	19	0
Lane Group Flow (vph)	147	295	0	145	389	0	53	582	0	216	716	0
Confl. Peds. (#/hr)	2		3	3		2	2		5	5		2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	9.3	22.2		8.6	21.5		3.0	16.7		12.0	25.7	
Effective Green, g (s)	9.3	22.2		8.6	21.5		3.0	16.7		12.0	25.7	
Actuated g/C Ratio	0.12	0.30		0.11	0.29		0.04	0.22		0.16	0.34	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	213	509		197	470		68	752		275	1146	
v/s Ratio Prot	0.09	0.17		c0.08	c0.24		0.03	c0.17		c0.13	0.21	
v/s Ratio Perm												
v/c Ratio	0.69	0.58		0.74	0.83		0.78	0.77		0.79	0.62	
Uniform Delay, d1	31.5	22.4		32.1	25.0		35.7	27.4		30.3	20.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.8		11.6	11.7		39.0	7.6		12.7	2.6	
Delay (s)	39.0	24.2		43.7	36.7		74.6	35.0		43.0	23.2	
Level of Service	D	C		D	D		E	C		D	C	
Approach Delay (s)		28.9			38.4			38.3			27.7	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	318	121	192	336	41	144	970	179	86	798	313
Future Volume (vph)	313	318	121	192	336	41	144	970	179	86	798	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	3205		1595	3290		1752	3505	1524	1752	3505	1539
Flt Permitted	0.95	0.99		0.95	1.00		0.15	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1595	3205		1595	3290		280	3505	1524	193	3505	1539
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	323	328	125	198	346	42	148	1000	185	89	823	323
RTOR Reduction (vph)	0	19	0	0	6	0	0	0	58	0	0	180
Lane Group Flow (vph)	258	499	0	178	402	0	148	1000	127	89	823	143
Confl. Peds. (#/hr)	8		1	1		8	5		13	13		5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	27.6	27.6		22.8	22.8		54.9	42.8	42.8	49.7	40.2	40.2
Effective Green, g (s)	27.6	27.6		22.8	22.8		54.9	42.8	42.8	49.7	40.2	40.2
Actuated g/C Ratio	0.22	0.22		0.19	0.19		0.45	0.35	0.35	0.40	0.33	0.33
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	358	719		295	610		270	1220	530	198	1146	503
v/s Ratio Prot	c0.16	0.16		0.11	c0.12		c0.05	c0.29		0.03	0.23	
v/s Ratio Perm							0.19		0.08	0.15		0.09
v/c Ratio	0.72	0.69		0.60	0.66		0.55	0.82	0.24	0.45	0.72	0.28
Uniform Delay, d1	44.1	43.8		45.9	46.4		23.6	36.5	28.5	26.1	36.4	30.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	3.1		4.0	2.9		2.3	4.7	0.3	1.6	2.3	0.4
Delay (s)	51.5	46.9		49.9	49.3		25.8	41.2	28.8	27.8	38.7	31.1
Level of Service	D	D		D	D		C	D	C	C	D	C
Approach Delay (s)		48.5			49.5			37.8			35.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	122.9	Sum of lost time (s)	20.2
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	11	5	0	29	4	1282	24	20	1068	13
Future Volume (Veh/h)	5	0	11	5	0	29	4	1282	24	20	1068	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	0	11	5	0	30	4	1335	25	21	1113	14
Pedestrians		10			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)								887			461	
pX, platoon unblocked	0.86	0.86	0.80	0.86	0.86	0.87	0.80			0.87		
vC, conflicting volume	1878	2544	574	1969	2538	684	1137			1364		
vC1, stage 1 conf vol	1172	1172		1360	1360							
vC2, stage 2 conf vol	706	1372		610	1179							
vCu, unblocked vol	1033	1810	0	1140	1804	352	657			1129		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	97	100	95	99			96		
cM capacity (veh/h)	272	184	851	183	197	559	724			530		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	16	35	4	890	470	21	742	385
Volume Left	5	5	4	0	0	21	0	0
Volume Right	11	30	0	0	25	0	0	14
cSH	511	432	724	1700	1700	530	1700	1700
Volume to Capacity	0.03	0.08	0.01	0.52	0.28	0.04	0.44	0.23
Queue Length 95th (ft)	2	7	0	0	0	3	0	0
Control Delay (s)	12.3	14.1	10.0	0.0	0.0	12.1	0.0	0.0
Lane LOS	B	B	A			B		
Approach Delay (s)	12.3	14.1	0.0			0.2		
Approach LOS	B	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	4	11	0	0	0	28	1301	1	3	982	62
Future Volume (Veh/h)	46	4	11	0	0	0	28	1301	1	3	982	62
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	53	5	13	0	0	0	33	1513	1	3	1142	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								680			668	
pX, platoon unblocked	0.88	0.88	0.80	0.88	0.88	0.84	0.80			0.84		
vC, conflicting volume	2006	2764	607	2172	2800	757	1214			1514		
vC1, stage 1 conf vol	1184	1184		1580	1580							
vC2, stage 2 conf vol	822	1580		592	1220							
vCu, unblocked vol	1056	1921	0	1245	1962	338	758			1236		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	97	98	100	100	100	95			99		
cM capacity (veh/h)	277	160	864	131	157	554	676			471		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	71	0	33	1009	505	574	643
Volume Left	53	0	33	0	0	3	0
Volume Right	13	0	0	0	1	0	72
cSH	298	1700	676	1700	1700	471	1700
Volume to Capacity	0.24	0.00	0.05	0.59	0.30	0.01	0.38
Queue Length 95th (ft)	23	0	4	0	0	0	0
Control Delay (s)	20.8	0.0	10.6	0.0	0.0	0.2	0.0
Lane LOS	C	A	B			A	
Approach Delay (s)	20.8	0.0	0.2			0.1	
Approach LOS	C	A					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	34	58	9	31	5	36	1084	7	0	839	85
Future Volume (vph)	116	34	58	9	31	5	36	1084	7	0	839	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	5.5			5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.96			0.99		1.00	1.00			0.99	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1713			1794		1752	3501			4953	
Flt Permitted		0.80			0.95		0.95	1.00			1.00	
Satd. Flow (perm)		1410			1713		1752	3501			4953	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	121	35	60	9	32	5	38	1129	7	0	874	89
RTOR Reduction (vph)	0	22	0	0	4	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	194	0	0	42	0	38	1136	0	0	953	0
Confl. Peds. (#/hr)	9		2	2		9	4		6	6		4
Confl. Bikes (#/hr)						1			3			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.1			16.1		3.0	53.9			46.4	
Effective Green, g (s)		16.1			16.1		3.0	53.9			46.4	
Actuated g/C Ratio		0.20			0.20		0.04	0.67			0.58	
Clearance Time (s)		4.5			4.5		4.5	5.5			5.5	
Vehicle Extension (s)		3.0			3.0		3.0	4.5			4.5	
Lane Grp Cap (vph)		283			344		65	2358			2872	
v/s Ratio Prot							0.02	c0.32			0.19	
v/s Ratio Perm		c0.14			0.02							
v/c Ratio		0.68			0.12		0.58	0.48			0.33	
Uniform Delay, d1		29.6			26.2		37.9	6.3			8.7	
Progression Factor		1.00			1.00		0.96	0.54			1.00	
Incremental Delay, d2		6.7			0.2		11.5	0.6			0.3	
Delay (s)		36.3			26.3		48.0	4.0			9.0	
Level of Service		D			C		D	A			A	
Approach Delay (s)		36.3			26.3			5.4			9.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	169	73	1073	148	57	848
Future Volume (vph)	169	73	1073	148	57	848
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		5.5		4.5	5.5
Lane Util. Factor	1.00		0.91		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.96		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1710		4923		1752	3505
Flt Permitted	0.97		1.00		0.95	1.00
Satd. Flow (perm)	1710		4923		1752	3505
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	180	78	1141	157	61	902
RTOR Reduction (vph)	23	0	16	0	0	0
Lane Group Flow (vph)	235	0	1282	0	61	902
Confl. Peds. (#/hr)	8			7	7	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	16.2		43.9		5.4	53.8
Effective Green, g (s)	16.2		43.9		5.4	53.8
Actuated g/C Ratio	0.20		0.55		0.07	0.67
Clearance Time (s)	4.5		5.5		4.5	5.5
Vehicle Extension (s)	3.0		4.5		3.0	4.5
Lane Grp Cap (vph)	346		2701		118	2357
v/s Ratio Prot	c0.14		c0.26		c0.03	0.26
v/s Ratio Perm						
v/c Ratio	0.68		0.47		0.52	0.38
Uniform Delay, d1	29.5		11.0		36.0	5.8
Progression Factor	1.00		1.00		0.90	0.37
Incremental Delay, d2	5.2		0.6		3.7	0.5
Delay (s)	34.7		11.6		36.2	2.6
Level of Service	C		B		D	A
Approach Delay (s)	34.7		11.6			4.7
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	20	32	1167	952	39
Future Volume (Veh/h)	12	20	32	1167	952	39
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	13	21	34	1241	1013	41
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					760	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1731	536	1063			
vC1, stage 1 conf vol	1042					
vC2, stage 2 conf vol	688					
vCu, unblocked vol	1584	251	839			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	95			
cM capacity (veh/h)	277	663	698			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	34	34	620	620	675	379
Volume Left	13	34	0	0	0	0
Volume Right	21	0	0	0	0	41
cSH	432	698	1700	1700	1700	1700
Volume to Capacity	0.08	0.05	0.36	0.36	0.40	0.22
Queue Length 95th (ft)	6	4	0	0	0	0
Control Delay (s)	14.0	10.4	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.0	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	0	24	11	0	12	25	1036	16	7	843	31
Future Volume (Veh/h)	39	0	24	11	0	12	25	1036	16	7	843	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	42	0	26	12	0	13	27	1114	17	8	906	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1160	
pX, platoon unblocked	0.95	0.95	0.95	0.95	0.95		0.95					
vC, conflicting volume	1562	2124	470	1672	2132	566	939			1131		
vC1, stage 1 conf vol	938	938		1176	1176							
vC2, stage 2 conf vol	624	1185		495	955							
vCu, unblocked vol	1479	2073	323	1594	2081	566	819			1131		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	100	96	93	100	97	96			99		
cM capacity (veh/h)	252	201	636	184	200	468	761			613		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	68	25	27	743	388	8	604	335
Volume Left	42	12	27	0	0	8	0	0
Volume Right	26	13	0	0	17	0	0	33
cSH	328	269	761	1700	1700	613	1700	1700
Volume to Capacity	0.21	0.09	0.04	0.44	0.23	0.01	0.36	0.20
Queue Length 95th (ft)	19	8	3	0	0	1	0	0
Control Delay (s)	18.8	19.8	9.9	0.0	0.0	10.9	0.0	0.0
Lane LOS	C	C	A			B		
Approach Delay (s)	18.8	19.8	0.2			0.1		
Approach LOS	C	C						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	35	0	1043	976	70
Future Volume (Veh/h)	60	35	0	1043	976	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	37	0	1098	1027	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1613	550	1101			
vC1, stage 1 conf vol	1064					
vC2, stage 2 conf vol	549					
vCu, unblocked vol	1613	550	1101			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	92	100			
cM capacity (veh/h)	263	478	630			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	100	0	549	549	685	416
Volume Left	63	0	0	0	0	0
Volume Right	37	0	0	0	0	74
cSH	315	1700	1700	1700	1700	1700
Volume to Capacity	0.32	0.00	0.32	0.32	0.40	0.24
Queue Length 95th (ft)	33	0	0	0	0	0
Control Delay (s)	21.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	21.6	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	48	37	1089	845	43
Future Volume (Veh/h)	33	48	37	1089	845	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	34	49	38	1123	871	44
Pedestrians	11					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1542	468	926			
vC1, stage 1 conf vol	904					
vC2, stage 2 conf vol	638					
vCu, unblocked vol	1542	468	926			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	91	95			
cM capacity (veh/h)	287	533	720			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	83	38	562	562	581	334
Volume Left	34	38	0	0	0	0
Volume Right	49	0	0	0	0	44
cSH	394	720	1700	1700	1700	1700
Volume to Capacity	0.21	0.05	0.33	0.33	0.34	0.20
Queue Length 95th (ft)	20	4	0	0	0	0
Control Delay (s)	16.5	10.3	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	16.5	0.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	1	15	15	3	94	5	1028	10	15	781	66
Future Volume (Veh/h)	37	1	15	15	3	94	5	1028	10	15	781	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	38	1	15	15	3	97	5	1060	10	15	805	68
Pedestrians		9			7			2				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		1			1			0				
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								910				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1516	1965	448	1532	1994	542	882			1077		
vC1, stage 1 conf vol	878	878		1082	1082							
vC2, stage 2 conf vol	638	1087		450	912							
vCu, unblocked vol	1134	1698	448	1154	1735	0	882			582		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	97	95	99	89	99			98		
cM capacity (veh/h)	276	256	550	307	254	854	750			775		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	54	115	5	707	363	15	537	336
Volume Left	38	15	5	0	0	15	0	0
Volume Right	15	97	0	0	10	0	0	68
cSH	320	660	750	1700	1700	775	1700	1700
Volume to Capacity	0.17	0.17	0.01	0.42	0.21	0.02	0.32	0.20
Queue Length 95th (ft)	15	16	1	0	0	1	0	0
Control Delay (s)	18.5	11.6	9.8	0.0	0.0	9.7	0.0	0.0
Lane LOS	C	B	A			A		
Approach Delay (s)	18.5	11.6	0.0			0.2		
Approach LOS	C	B						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	242	64	70	211	211	111	705	155	240	453	179
Future Volume (vph)	134	242	64	70	211	211	111	705	155	240	453	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1781		1752	1706		1752	3392		1752	3322	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1781		1752	1706		1752	3392		1752	3322	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	141	255	67	74	222	222	117	742	163	253	477	188
RTOR Reduction (vph)	0	10	0	0	35	0	0	18	0	0	43	0
Lane Group Flow (vph)	141	312	0	74	409	0	117	887	0	253	622	0
Confl. Peds. (#/hr)			3	3			5		3	3		5
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	9.6	26.1		9.7	26.2		7.3	32.2		16.5	41.4	
Effective Green, g (s)	9.6	26.1		9.7	26.2		7.3	32.2		16.5	41.4	
Actuated g/C Ratio	0.10	0.26		0.10	0.26		0.07	0.32		0.16	0.41	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	168	464		169	446		127	1092		289	1375	
v/s Ratio Prot	c0.08	0.18		0.04	c0.24		0.07	c0.26		c0.14	0.19	
v/s Ratio Perm												
v/c Ratio	0.84	0.67		0.44	0.92		0.92	0.81		0.88	0.45	
Uniform Delay, d1	44.4	33.1		42.6	35.9		46.1	31.1		40.7	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.0	4.0		0.7	23.9		55.4	6.6		23.6	1.1	
Delay (s)	72.4	37.1		43.2	59.8		101.4	37.7		64.3	22.2	
Level of Service	E	D		D	E		F	D		E	C	
Approach Delay (s)		47.9			57.4			45.0			33.8	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D – Existing plus Planned Roadway improvements Level of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	425	245	66	153	177	31	90	727	102	41	901	217
Future Volume (vph)	425	245	66	153	177	31	90	727	102	41	901	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3162		1564	3207		1719	3438	1500	1719	3438	1503
Flt Permitted	0.95	0.98		0.95	0.99		0.10	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1564	3162		1564	3207		181	3438	1500	452	3438	1503
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	478	275	74	194	224	39	95	765	107	45	990	238
RTOR Reduction (vph)	0	8	0	0	8	0	0	0	55	0	0	106
Lane Group Flow (vph)	272	547	0	149	300	0	95	765	52	45	990	132
Confl. Peds. (#/hr)			4						10			9
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	28.3	28.3		18.7	18.7		54.2	44.9	44.9	47.8	41.7	41.7
Effective Green, g (s)	28.3	28.3		18.7	18.7		54.2	44.9	44.9	47.8	41.7	41.7
Actuated g/C Ratio	0.24	0.24		0.16	0.16		0.46	0.38	0.38	0.40	0.35	0.35
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	374	757		247	507		204	1305	569	248	1212	530
v/s Ratio Prot	c0.17	0.17		c0.10	0.09		c0.04	0.22		0.01	c0.29	
v/s Ratio Perm							0.18		0.03	0.06		0.09
v/c Ratio	0.73	0.72		0.60	0.59		0.47	0.59	0.09	0.18	0.82	0.25
Uniform Delay, d1	41.4	41.3		46.3	46.2		22.8	29.2	23.5	22.3	34.8	27.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	3.7		4.7	2.2		1.7	0.8	0.1	0.4	4.6	0.3
Delay (s)	48.8	45.0		51.0	48.4		24.5	30.0	23.6	22.6	39.4	27.5
Level of Service	D	D		D	D		C	C	C	C	D	C
Approach Delay (s)		46.2			49.3			28.8			36.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	20.2
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	9	0	0	17	0	960	25	0	1069	7
Future Volume (Veh/h)	0	0	9	0	0	17	0	960	25	0	1069	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.53	0.53	0.53	0.93	0.93	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	12	0	0	32	0	1032	27	0	1188	8
Pedestrians		4			9							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1037			461	
pX, platoon unblocked	0.76	0.76	0.74	0.76	0.76	0.96	0.74			0.96		
vC, conflicting volume	1744	2264	602	1660	2254	538	1200			1068		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1111	1794	0	1002	1781	434	573			986		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	98	100	100	94	100			100		
cM capacity (veh/h)	112	57	792	141	59	532	716			640		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	32	688	371	792	404
Volume Left	0	0	0	0	0	0
Volume Right	12	32	0	27	0	8
cSH	792	532	1700	1700	1700	1700
Volume to Capacity	0.02	0.06	0.40	0.22	0.47	0.24
Queue Length 95th (ft)	1	5	0	0	0	0
Control Delay (s)	9.6	12.2	0.0	0.0	0.0	0.0
Lane LOS	A	B				
Approach Delay (s)	9.6	12.2	0.0		0.0	
Approach LOS	A	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	0	14	0	0	0	21	653	0	18	900	28
Future Volume (Veh/h)	87	0	14	0	0	0	21	653	0	18	900	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	98	0	16	0	0	0	24	734	0	20	1011	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								830			668	
pX, platoon unblocked	0.79	0.79	0.76	0.79	0.79	0.94	0.76			0.94		
vC, conflicting volume	1482	1848	521	1344	1864	367	1042			734		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724	1189	0	549	1208	193	420			584		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	100	98	100	100	100	97			98		
cM capacity (veh/h)	238	140	823	312	137	766	862			925		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	114	0	24	489	245	20	674	368
Volume Left	98	0	24	0	0	20	0	0
Volume Right	16	0	0	0	0	0	0	31
cSH	265	1700	862	1700	1700	925	1700	1700
Volume to Capacity	0.43	0.00	0.03	0.29	0.14	0.02	0.40	0.22
Queue Length 95th (ft)	51	0	2	0	0	2	0	0
Control Delay (s)	28.5	0.0	9.3	0.0	0.0	9.0	0.0	0.0
Lane LOS	D	A	A			A		
Approach Delay (s)	28.5	0.0	0.3			0.2		
Approach LOS	D	A						

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	123	0	0	1	0	830	4	0	908	75
Future Volume (Veh/h)	0	0	123	0	0	1	0	830	4	0	908	75
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.56	0.56	0.56	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	135	0	0	2	0	902	4	0	987	82
Pedestrians		3			3						9	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		0			0						1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								150				
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1493	1940	373	1371	1979	465	1072			909		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1242	1764	373	1100	1809	44	1072			561		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	78	100	100	100	100			100		
cM capacity (veh/h)	107	68	611	107	64	851	621			837		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	135	2	601	305	395	395	279
Volume Left	0	0	0	0	0	0	0
Volume Right	135	2	0	4	0	0	82
cSH	611	851	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.00	0.35	0.18	0.23	0.23	0.16
Queue Length 95th (ft)	21	0	0	0	0	0	0
Control Delay (s)	12.6	9.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A					
Approach Delay (s)	12.6	9.2	0.0		0.0		
Approach LOS	B	A					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	111	0	57	28	830	112	75	949	0
Future Volume (vph)	0	0	0	111	0	57	28	830	112	75	949	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		5.5	5.5		4.5	5.5	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.98		1.00	1.00	
Flt Protected					0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1656		1770	3335		1703	3406	
Flt Permitted					0.97		0.26	1.00		0.95	1.00	
Satd. Flow (perm)					1656		479	3335		1703	3406	
Peak-hour factor, PHF	0.92	0.92	0.92	0.65	0.92	0.65	0.92	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	171	0	88	30	883	119	82	1032	0
RTOR Reduction (vph)	0	0	0	0	115	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	144	0	30	997	0	82	1032	0
Confl. Peds. (#/hr)									2			
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	2%	2%	2%	6%	2%	6%	2%	6%	6%	6%	6%	2%
Turn Type				Split	NA		Perm	NA		Prot	NA	
Protected Phases		4		8	8			2		1	6	
Permitted Phases	4						2					
Actuated Green, G (s)					14.2		66.4	66.4		7.4	78.3	
Effective Green, g (s)					14.2		66.4	66.4		7.4	78.3	
Actuated g/C Ratio					0.14		0.65	0.65		0.07	0.76	
Clearance Time (s)					4.5		5.5	5.5		4.5	5.5	
Vehicle Extension (s)					3.0		4.5	4.5		3.0	4.5	
Lane Grp Cap (vph)					229		310	2160		122	2601	
v/s Ratio Prot					c0.09			c0.30		c0.05	0.30	
v/s Ratio Perm							0.06					
v/c Ratio					0.63		0.10	0.46		0.67	0.40	
Uniform Delay, d1					41.7		6.8	9.1		46.4	4.1	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					5.6		0.6	0.7		13.6	0.5	
Delay (s)					47.2		7.4	9.8		60.0	4.6	
Level of Service					D		A	A		E	A	
Approach Delay (s)		0.0			47.2			9.7			8.6	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	19	0	0	11	0	918	5	0	974	34
Future Volume (Veh/h)	0	0	19	0	0	11	0	918	5	0	974	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.92	0.95	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	0	0	20	0	0	12	0	966	5	0	1025	36
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											760	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1539	2015	532	1501	2030	486	1062			971		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1408	1926	309	1366	1943	486	888			971		
tC, single (s)	7.6	6.5	7.0	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	97	100	100	98	100			100		
cM capacity (veh/h)	85	60	618	94	59	528	673			706		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	12	644	327	683	378
Volume Left	0	0	0	0	0	0
Volume Right	20	12	0	5	0	36
cSH	618	528	1700	1700	1700	1700
Volume to Capacity	0.03	0.02	0.38	0.19	0.40	0.22
Queue Length 95th (ft)	3	2	0	0	0	0
Control Delay (s)	11.0	12.0	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	11.0	12.0	0.0		0.0	
Approach LOS	B	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	32	0	0	0	18	658	20	0	867	13
Future Volume (Veh/h)	0	0	32	0	0	0	18	658	20	0	867	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	36	0	0	0	20	731	22	0	963	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1160	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1376	1763	488	1300	1759	376	977			753		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1304	1709	378	1225	1704	376	888			753		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	100	97			100		
cM capacity (veh/h)	111	84	594	119	84	621	727			853		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	36	0	20	487	266	642	335
Volume Left	0	0	20	0	0	0	0
Volume Right	36	0	0	0	22	0	14
cSH	594	1700	727	1700	1700	1700	1700
Volume to Capacity	0.06	0.00	0.03	0.29	0.16	0.38	0.20
Queue Length 95th (ft)	5	0	2	0	0	0	0
Control Delay (s)	11.5	0.0	10.1	0.0	0.0	0.0	0.0
Lane LOS	B	A	B				
Approach Delay (s)	11.5	0.0	0.3			0.0	
Approach LOS	B	A					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	44	20	668	844	21
Future Volume (Veh/h)	0	44	20	668	844	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	48	22	726	917	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1336	470	940			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1336	470	940			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	97			
cM capacity (veh/h)	140	540	725			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	48	22	363	363	611	329
Volume Left	0	22	0	0	0	0
Volume Right	48	0	0	0	0	23
cSH	540	725	1700	1700	1700	1700
Volume to Capacity	0.09	0.03	0.21	0.21	0.36	0.19
Queue Length 95th (ft)	7	2	0	0	0	0
Control Delay (s)	12.3	10.1	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	12.3	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	55	23	918	936	10
Future Volume (Veh/h)	0	55	23	918	936	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	59	24	977	996	11
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1542	508	1011			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1542	508	1011			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	100	88	96			
cM capacity (veh/h)	98	498	655			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	59	24	488	488	664	343
Volume Left	0	24	0	0	0	0
Volume Right	59	0	0	0	0	11
cSH	498	655	1700	1700	1700	1700
Volume to Capacity	0.12	0.04	0.29	0.29	0.39	0.20
Queue Length 95th (ft)	10	3	0	0	0	0
Control Delay (s)	13.2	10.7	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	13.2	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	0	0	44	0	866	47	0	937	55
Future Volume (Veh/h)	0	0	15	0	0	44	0	866	47	0	937	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	16	0	0	47	0	931	51	0	1008	59
Pedestrians		4			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								910				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1554	2028	538	1480	2032	495	1071			986		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1339	1883	538	1254	1887	122	1071			686		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	97	100	100	94	100			100		
cM capacity (veh/h)	87	58	476	103	58	775	621			761		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	47	621	361	672	395
Volume Left	0	0	0	0	0	0
Volume Right	16	47	0	51	0	59
cSH	476	775	1700	1700	1700	1700
Volume to Capacity	0.03	0.06	0.37	0.21	0.40	0.23
Queue Length 95th (ft)	3	5	0	0	0	0
Control Delay (s)	12.8	9.9	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.8	9.9	0.0		0.0	
Approach LOS	B	A				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	209	87	136	182	239	50	505	52	203	583	108
Future Volume (vph)	138	209	87	136	182	239	50	505	52	203	583	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1721		1719	1642		1719	3380		1719	3345	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1721		1719	1642		1719	3380		1719	3345	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	147	222	93	145	194	254	53	537	55	216	620	115
RTOR Reduction (vph)	0	20	0	0	59	0	0	10	0	0	19	0
Lane Group Flow (vph)	147	295	0	145	389	0	53	582	0	216	716	0
Confl. Peds. (#/hr)	2		3	3		2	2		5	5		2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	9.3	22.2		8.6	21.5		3.0	16.7		12.0	25.7	
Effective Green, g (s)	9.3	22.2		8.6	21.5		3.0	16.7		12.0	25.7	
Actuated g/C Ratio	0.12	0.30		0.11	0.29		0.04	0.22		0.16	0.34	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	213	509		197	470		68	752		275	1146	
v/s Ratio Prot	0.09	0.17		c0.08	c0.24		0.03	c0.17		c0.13	0.21	
v/s Ratio Perm												
v/c Ratio	0.69	0.58		0.74	0.83		0.78	0.77		0.79	0.62	
Uniform Delay, d1	31.5	22.4		32.1	25.0		35.7	27.4		30.3	20.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.8		11.6	11.7		39.0	7.6		12.7	2.6	
Delay (s)	39.0	24.2		43.7	36.7		74.6	35.0		43.0	23.2	
Level of Service	D	C		D	D		E	C		D	C	
Approach Delay (s)		28.9			38.4			38.3			27.7	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	318	121	192	336	41	148	970	179	86	798	313
Future Volume (vph)	313	318	121	192	336	41	148	970	179	86	798	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	3205		1595	3290		1752	3505	1524	1752	3505	1539
Flt Permitted	0.95	0.99		0.95	1.00		0.15	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	1595	3205		1595	3290		276	3505	1524	195	3505	1539
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	323	328	125	198	346	42	153	1000	185	89	823	323
RTOR Reduction (vph)	0	19	0	0	6	0	0	0	58	0	0	181
Lane Group Flow (vph)	258	499	0	178	402	0	153	1000	127	89	823	142
Confl. Peds. (#/hr)	8		1	1		8	5		13	13		5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	27.7	27.7		22.8	22.8		55.4	43.0	43.0	49.8	40.2	40.2
Effective Green, g (s)	27.7	27.7		22.8	22.8		55.4	43.0	43.0	49.8	40.2	40.2
Actuated g/C Ratio	0.22	0.22		0.18	0.18		0.45	0.35	0.35	0.40	0.33	0.33
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	358	720		294	608		272	1222	531	199	1142	501
v/s Ratio Prot	c0.16	0.16		0.11	c0.12		c0.06	c0.29		0.03	0.23	
v/s Ratio Perm							0.20		0.08	0.15		0.09
v/c Ratio	0.72	0.69		0.61	0.66		0.56	0.82	0.24	0.45	0.72	0.28
Uniform Delay, d1	44.2	43.9		46.1	46.7		23.6	36.6	28.5	26.2	36.6	30.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	3.1		4.0	3.0		2.7	4.6	0.3	1.6	2.4	0.4
Delay (s)	51.7	47.0		50.2	49.6		26.3	41.2	28.8	27.8	39.0	31.3
Level of Service	D	D		D	D		C	D	C	C	D	C
Approach Delay (s)		48.6			49.8			37.8			36.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	20.2
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	16	0	0	29	0	1257	44	0	1088	17
Future Volume (Veh/h)	0	0	16	0	0	29	0	1257	44	0	1088	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	17	0	0	30	0	1309	46	0	1133	18
Pedestrians		10			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1037			461	
pX, platoon unblocked	0.87	0.87	0.79	0.87	0.87	0.85	0.79			0.85		
vC, conflicting volume	1836	2511	586	1920	2497	682	1161			1359		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	894	1672	0	990	1656	281	683			1076		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	95	100			100		
cM capacity (veh/h)	189	80	850	167	82	606	707			542		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	30	873	482	755	396
Volume Left	0	0	0	0	0	0
Volume Right	17	30	0	46	0	18
cSH	850	606	1700	1700	1700	1700
Volume to Capacity	0.02	0.05	0.51	0.28	0.44	0.23
Queue Length 95th (ft)	2	4	0	0	0	0
Control Delay (s)	9.3	11.3	0.0	0.0	0.0	0.0
Lane LOS	A	B				
Approach Delay (s)	9.3	11.3	0.0		0.0	
Approach LOS	A	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	4	11	0	0	0	59	1247	1	12	977	62
Future Volume (Veh/h)	104	4	11	0	0	0	59	1247	1	12	977	62
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	121	5	13	0	0	0	69	1450	1	14	1136	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								830			668	
pX, platoon unblocked	0.90	0.90	0.80	0.90	0.90	0.79	0.80			0.79		
vC, conflicting volume	2063	2789	604	2200	2824	726	1208			1451		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	930	1741	0	1083	1780	135	749			1049		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	33	93	98	100	100	100	90			97		
cM capacity (veh/h)	180	67	863	129	64	705	681			523		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	139	0	69	967	484	14	757	451
Volume Left	121	0	69	0	0	14	0	0
Volume Right	13	0	0	0	1	0	0	72
cSH	182	1700	681	1700	1700	523	1700	1700
Volume to Capacity	0.76	0.00	0.10	0.57	0.28	0.03	0.45	0.27
Queue Length 95th (ft)	125	0	8	0	0	2	0	0
Control Delay (s)	69.4	0.0	10.9	0.0	0.0	12.1	0.0	0.0
Lane LOS	F	A	B			B		
Approach Delay (s)	69.4	0.0	0.5			0.1		
Approach LOS	F	A						

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	150	0	0	5	0	1142	7	0	839	85
Future Volume (Veh/h)	0	0	150	0	0	5	0	1142	7	0	839	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	156	0	0	5	0	1190	7	0	874	89
Pedestrians		4			6			2			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								154				
pX, platoon unblocked	0.76	0.76		0.76	0.76	0.76				0.76		
vC, conflicting volume	1532	2126	342	1649	2166	614	967			1203		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1075	1854	342	1229	1908	0	967			645		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	76	100	100	99	100			100		
cM capacity (veh/h)	128	55	647	76	51	813	699			705		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	156	5	793	404	350	350	264
Volume Left	0	0	0	0	0	0	0
Volume Right	156	5	0	7	0	0	89
cSH	647	813	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.01	0.47	0.24	0.21	0.21	0.16
Queue Length 95th (ft)	23	0	0	0	0	0	0
Control Delay (s)	12.3	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A					
Approach Delay (s)	12.3	9.5	0.0		0.0		
Approach LOS	B	A					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	174	0	104	44	1131	148	91	906	0
Future Volume (vph)	0	0	0	174	0	104	44	1131	148	91	906	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		5.5	5.5		4.5	5.5	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.98		1.00	1.00	
Flt Protected					0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1698		1770	3428		1752	3505	
Flt Permitted					0.97		0.28	1.00		0.95	1.00	
Satd. Flow (perm)					1698		513	3428		1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.92	0.94	0.92	0.94	0.94	0.94	0.94	0.92
Adj. Flow (vph)	0	0	0	185	0	111	48	1203	157	97	964	0
RTOR Reduction (vph)	0	0	0	0	112	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	184	0	48	1355	0	97	964	0
Confl. Peds. (#/hr)				8					7	7		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%	3%	2%
Turn Type				Split	NA		Perm	NA		Prot	NA	
Protected Phases		4		8	8			2		1	6	
Permitted Phases	4						2					
Actuated Green, G (s)					16.0		64.4	64.4		7.6	76.5	
Effective Green, g (s)					16.0		64.4	64.4		7.6	76.5	
Actuated g/C Ratio					0.16		0.63	0.63		0.07	0.75	
Clearance Time (s)					4.5		5.5	5.5		4.5	5.5	
Vehicle Extension (s)					3.0		4.5	4.5		3.0	4.5	
Lane Grp Cap (vph)					265		322	2153		129	2615	
v/s Ratio Prot					c0.11			c0.40		c0.06	0.28	
v/s Ratio Perm							0.09					
v/c Ratio					0.69		0.15	0.63		0.75	0.37	
Uniform Delay, d1					40.9		7.8	11.7		46.5	4.5	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					7.6		1.0	1.4		21.6	0.4	
Delay (s)					48.6		8.8	13.1		68.1	5.0	
Level of Service					D		A	B		E	A	
Approach Delay (s)		0.0			48.6			13.0			10.7	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	32	0	0	7	0	1202	1	0	964	71
Future Volume (Veh/h)	0	0	32	0	0	7	0	1202	1	0	964	71
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.92	0.94	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.94	0.94
Hourly flow rate (vph)	0	0	34	0	0	8	0	1279	1	0	1026	76
Pedestrians		9										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											760	
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1720	2353	560	1826	2390	640	1111			1280		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1596	2290	322	1712	2331	640	927			1280		
tC, single (s)	7.6	6.5	7.0	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	98	100			100		
cM capacity (veh/h)	62	35	606	50	33	418	657			538		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	34	8	853	427	684	418
Volume Left	0	0	0	0	0	0
Volume Right	34	8	0	1	0	76
cSH	606	418	1700	1700	1700	1700
Volume to Capacity	0.06	0.02	0.50	0.25	0.40	0.25
Queue Length 95th (ft)	4	1	0	0	0	0
Control Delay (s)	11.3	13.8	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	11.3	13.8	0.0		0.0	
Approach LOS	B	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	63	0	0	23	25	1096	23	0	862	31
Future Volume (Veh/h)	0	0	63	0	0	23	25	1096	23	0	862	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	68	0	0	25	27	1178	25	0	927	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1160	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1612	2200	480	1776	2204	602	960			1203		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1549	2164	366	1721	2169	602	868			1203		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	89	100	100	94	96			100		
cM capacity (veh/h)	68	43	604	47	43	443	739			576		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	68	25	27	785	418	618	342
Volume Left	0	0	27	0	0	0	0
Volume Right	68	25	0	0	25	0	33
cSH	604	443	739	1700	1700	1700	1700
Volume to Capacity	0.11	0.06	0.04	0.46	0.25	0.36	0.20
Queue Length 95th (ft)	9	4	3	0	0	0	0
Control Delay (s)	11.7	13.6	10.1	0.0	0.0	0.0	0.0
Lane LOS	B	B	B				
Approach Delay (s)	11.7	13.6	0.2			0.0	
Approach LOS	B	B					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	95	0	1043	1036	70
Future Volume (Veh/h)	0	95	0	1043	1036	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	100	0	1098	1091	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1677	582	1165			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1677	582	1165			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	86	456	595			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	100	0	549	549	727	438
Volume Left	0	0	0	0	0	0
Volume Right	100	0	0	0	0	74
cSH	456	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.00	0.32	0.32	0.43	0.26
Queue Length 95th (ft)	21	0	0	0	0	0
Control Delay (s)	15.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	15.1	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	81	37	1122	845	43
Future Volume (Veh/h)	0	81	37	1122	845	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	84	38	1157	871	44
Pedestrians	11					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1558	468	926			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1558	468	926			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	84	95			
cM capacity (veh/h)	96	533	720			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	84	38	578	578	581	334
Volume Left	0	38	0	0	0	0
Volume Right	84	0	0	0	0	44
cSH	533	720	1700	1700	1700	1700
Volume to Capacity	0.16	0.05	0.34	0.34	0.34	0.20
Queue Length 95th (ft)	14	4	0	0	0	0
Control Delay (s)	13.0	10.3	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	13.0	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	0	0	112	0	1066	25	0	829	66
Future Volume (Veh/h)	0	0	15	0	0	112	0	1066	25	0	829	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	15	0	0	115	0	1099	26	0	855	68
Pedestrians		9			7			2				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		1			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								910				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	1562	2030	472	1564	2051	570	932			1132		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1178	1771	472	1179	1797	0	932			632		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	86	100			100		
cM capacity (veh/h)	97	63	530	109	61	847	718			736		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	115	733	392	570	353
Volume Left	0	0	0	0	0	0
Volume Right	15	115	0	26	0	68
cSH	530	847	1700	1700	1700	1700
Volume to Capacity	0.03	0.14	0.43	0.23	0.34	0.21
Queue Length 95th (ft)	2	12	0	0	0	0
Control Delay (s)	12.0	9.9	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.0	9.9	0.0		0.0	
Approach LOS	B	A				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	43.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	242	64	70	211	211	111	705	155	240	453	179
Future Volume (vph)	134	242	64	70	211	211	111	705	155	240	453	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1781		1752	1706		1752	3392		1752	3322	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1781		1752	1706		1752	3392		1752	3322	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	141	255	67	74	222	222	117	742	163	253	477	188
RTOR Reduction (vph)	0	10	0	0	35	0	0	18	0	0	43	0
Lane Group Flow (vph)	141	312	0	74	409	0	117	887	0	253	622	0
Confl. Peds. (#/hr)			3	3			5		3	3		5
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	9.6	26.1		9.7	26.2		7.3	32.2		16.5	41.4	
Effective Green, g (s)	9.6	26.1		9.7	26.2		7.3	32.2		16.5	41.4	
Actuated g/C Ratio	0.10	0.26		0.10	0.26		0.07	0.32		0.16	0.41	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	168	464		169	446		127	1092		289	1375	
v/s Ratio Prot	c0.08	0.18		0.04	c0.24		0.07	c0.26		c0.14	0.19	
v/s Ratio Perm												
v/c Ratio	0.84	0.67		0.44	0.92		0.92	0.81		0.88	0.45	
Uniform Delay, d1	44.4	33.1		42.6	35.9		46.1	31.1		40.7	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.0	4.0		0.7	23.9		55.4	6.6		23.6	1.1	
Delay (s)	72.4	37.1		43.2	59.8		101.4	37.7		64.3	22.2	
Level of Service	E	D		D	E		F	D		E	C	
Approach Delay (s)		47.9			57.4			45.0			33.8	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix E – Existing plus Planned Roadway Improvements – Mitigations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	4	11	0	0	0	59	1247	1	12	977	62
Future Volume (vph)	104	4	11	0	0	0	59	1247	1	12	977	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5					4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frt		0.99					1.00	1.00		1.00	0.99	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1763					1770	3539		1770	3508	
Flt Permitted		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1763					1770	3539		1770	3508	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	121	5	13	0	0	0	69	1450	1	14	1136	72
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	135	0	0	0	0	69	1451	0	14	1205	0
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								
Actuated Green, G (s)		10.1					4.4	40.8		0.8	37.2	
Effective Green, g (s)		10.1					4.4	40.8		0.8	37.2	
Actuated g/C Ratio		0.15					0.07	0.63		0.01	0.57	
Clearance Time (s)		4.5					4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		273					119	2214		21	2001	
v/s Ratio Prot		c0.08					c0.04	c0.41		0.01	0.34	
v/s Ratio Perm												
v/c Ratio		0.49					0.58	0.66		0.67	0.60	
Uniform Delay, d1		25.2					29.5	7.7		32.1	9.2	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4					6.7	0.7		58.7	0.5	
Delay (s)		26.6					36.2	8.4		90.7	9.7	
Level of Service		C					D	A		F	A	
Approach Delay (s)		26.6			0.0			9.7			10.6	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix F – Cumulative (Year 2040) Conditions Intersection Level of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	319	86	199	230	40	117	946	133	53	1172	282
Future Volume (vph)	553	319	86	199	230	40	117	946	133	53	1172	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3161		1564	3208		1719	3438	1498	1719	3438	1501
Flt Permitted	0.95	0.98		0.95	0.99		0.09	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	1564	3161		1564	3208		158	3438	1498	195	3438	1501
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	621	358	97	252	291	51	123	996	140	58	1288	310
RTOR Reduction (vph)	0	7	0	0	8	0	0	0	58	0	0	113
Lane Group Flow (vph)	354	715	0	197	389	0	123	996	82	58	1288	197
Confl. Peds. (#/hr)			4						10			9
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	34.9	34.9		24.0	24.0		57.2	45.8	45.8	48.2	41.3	41.3
Effective Green, g (s)	34.9	34.9		24.0	24.0		57.2	45.8	45.8	48.2	41.3	41.3
Actuated g/C Ratio	0.26	0.26		0.18	0.18		0.43	0.35	0.35	0.37	0.31	0.31
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	414	837		284	584		203	1194	520	151	1077	470
v/s Ratio Prot	c0.23	0.23		c0.13	0.12		c0.05	c0.29		0.02	c0.37	
v/s Ratio Perm							0.21		0.05	0.12		0.13
v/c Ratio	0.86	0.85		0.69	0.67		0.61	0.83	0.16	0.38	1.20	0.42
Uniform Delay, d1	46.0	46.0		50.5	50.2		29.9	39.5	29.7	30.3	45.3	35.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.2	8.8		7.7	3.2		5.0	5.4	0.2	1.6	97.4	0.8
Delay (s)	62.3	54.8		58.2	53.3		34.9	44.9	29.9	31.9	142.6	36.6
Level of Service	E	D		E	D		C	D	C	C	F	D
Approach Delay (s)		57.2			54.9			42.3			118.9	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	75.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	131.8	Sum of lost time (s)	20.2
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	1	3	0	22	0	1238	20	13	1378	9
Future Volume (Veh/h)	10	0	1	3	0	22	0	1238	20	13	1378	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.53	0.53	0.53	0.93	0.93	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	1	6	0	42	0	1331	22	14	1531	10
Pedestrians		4			9							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)								887			461	
pX, platoon unblocked	0.76	0.76	0.69	0.76	0.76	0.87	0.69			0.87		
vC, conflicting volume	2276	2930	774	2146	2924	686	1545			1362		
vC1, stage 1 conf vol	1568	1568		1351	1351							
vC2, stage 2 conf vol	708	1362		794	1573							
vCu, unblocked vol	1275	2139	0	1104	2131	342	900			1119		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	93	100	100	97	100	92	100			97		
cM capacity (veh/h)	177	156	740	182	161	555	501			516		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	14	48	887	466	14	1021	520
Volume Left	13	6	0	0	14	0	0
Volume Right	1	42	0	22	0	0	10
cSH	187	442	1700	1700	516	1700	1700
Volume to Capacity	0.07	0.11	0.52	0.27	0.03	0.60	0.31
Queue Length 95th (ft)	6	9	0	0	2	0	0
Control Delay (s)	25.8	14.1	0.0	0.0	12.2	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	25.8	14.1	0.0		0.1		
Approach LOS	D	B					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	18	0	0	0	5	909	0	0	1173	36
Future Volume (Veh/h)	40	0	18	0	0	0	5	909	0	0	1173	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	45	0	20	0	0	0	6	1021	0	0	1318	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								680			668	
pX, platoon unblocked	0.77	0.77	0.70	0.77	0.77	0.86	0.70			0.86		
vC, conflicting volume	1860	2371	679	1712	2391	510	1358			1021		
vC1, stage 1 conf vol	1338	1338		1033	1033							
vC2, stage 2 conf vol	522	1033		679	1358							
vCu, unblocked vol	688	1354	0	494	1380	104	641			698		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	97	100	100	100	99			100		
cM capacity (veh/h)	303	265	755	324	257	800	654			769		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	65	0	6	510	510	879	479
Volume Left	45	0	6	0	0	0	0
Volume Right	20	0	0	0	0	0	40
cSH	371	1700	654	1700	1700	1700	1700
Volume to Capacity	0.18	0.00	0.01	0.30	0.30	0.52	0.28
Queue Length 95th (ft)	16	0	1	0	0	0	0
Control Delay (s)	16.7	0.0	10.6	0.0	0.0	0.0	0.0
Lane LOS	C	A	B				
Approach Delay (s)	16.7	0.0	0.1			0.0	
Approach LOS	C	A					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	35	53	3	22	1	36	1008	5	0	1181	98
Future Volume (vph)	144	35	53	3	22	1	36	1008	5	0	1181	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	5.5			5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00			1.00	
Frt		0.97			0.99		1.00	1.00			0.99	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1676			1771		1703	3403			4827	
Flt Permitted		0.78			0.97		0.95	1.00			1.00	
Satd. Flow (perm)		1354			1720		1703	3403			4827	
Peak-hour factor, PHF	0.91	0.91	0.91	0.56	0.56	0.56	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	38	58	5	39	2	39	1096	5	0	1284	107
RTOR Reduction (vph)	0	16	0	0	2	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	238	0	0	44	0	39	1101	0	0	1382	0
Confl. Peds. (#/hr)	9					9			3			3
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4								
Actuated Green, G (s)		19.3			19.3		3.0	50.7			43.2	
Effective Green, g (s)		19.3			19.3		3.0	50.7			43.2	
Actuated g/C Ratio		0.24			0.24		0.04	0.63			0.54	
Clearance Time (s)		4.5			4.5		4.5	5.5			5.5	
Vehicle Extension (s)		3.0			3.0		3.0	4.5			4.5	
Lane Grp Cap (vph)		326			414		63	2156			2606	
v/s Ratio Prot							0.02	c0.32			0.29	
v/s Ratio Perm		c0.18			0.03							
v/c Ratio		0.73			0.11		0.62	0.51			0.53	
Uniform Delay, d1		28.0			23.6		37.9	7.9			11.9	
Progression Factor		1.00			1.00		0.91	0.55			1.00	
Incremental Delay, d2		8.2			0.1		14.9	0.8			0.8	
Delay (s)		36.1			23.8		49.3	5.1			12.6	
Level of Service		D			C		D	A			B	
Approach Delay (s)		36.1			23.8			6.6			12.6	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	142	52	1008	146	62	1163
Future Volume (vph)	142	52	1008	146	62	1163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		5.5		4.5	5.5
Lane Util. Factor	1.00		0.91		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.96		0.98		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1667		4785		1703	3406
Flt Permitted	0.96		1.00		0.95	1.00
Satd. Flow (perm)	1667		4785		1703	3406
Peak-hour factor, PHF	0.65	0.65	0.94	0.94	0.92	0.92
Adj. Flow (vph)	218	80	1072	155	67	1264
RTOR Reduction (vph)	18	0	19	0	0	0
Lane Group Flow (vph)	280	0	1208	0	67	1264
Confl. Peds. (#/hr)				2		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	18.5		40.1		6.9	51.5
Effective Green, g (s)	18.5		40.1		6.9	51.5
Actuated g/C Ratio	0.23		0.50		0.09	0.64
Clearance Time (s)	4.5		5.5		4.5	5.5
Vehicle Extension (s)	3.0		4.5		3.0	4.5
Lane Grp Cap (vph)	385		2398		146	2192
v/s Ratio Prot	c0.17		0.25		0.04	c0.37
v/s Ratio Perm						
v/c Ratio	0.73		0.50		0.46	0.58
Uniform Delay, d1	28.4		13.3		34.8	8.1
Progression Factor	1.00		1.00		0.76	0.34
Incremental Delay, d2	6.7		0.8		2.0	1.0
Delay (s)	35.1		14.1		28.3	3.7
Level of Service	D		B		C	A
Approach Delay (s)	35.1		14.1			4.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	18	30	1158	1254	14
Future Volume (Veh/h)	7	18	30	1158	1254	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	19	32	1219	1320	15
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					760	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	2002	668	1336			
vC1, stage 1 conf vol	1328					
vC2, stage 2 conf vol	674					
vCu, unblocked vol	1758	99	929			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4	2.3			
p0 queue free %	97	97	94			
cM capacity (veh/h)	229	743	568			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	26	32	610	610	880	455
Volume Left	7	32	0	0	0	0
Volume Right	19	0	0	0	0	15
cSH	463	568	1700	1700	1700	1700
Volume to Capacity	0.06	0.06	0.36	0.36	0.52	0.27
Queue Length 95th (ft)	4	4	0	0	0	0
Control Delay (s)	13.2	11.7	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	13.2	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	9	16	0	0	0	23	839	9	17	1104	17
Future Volume (Veh/h)	17	9	16	0	0	0	23	839	9	17	1104	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	10	18	0	0	0	26	932	10	19	1227	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1160	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1792	2268	623	1664	2273	471	1246			942		
vC1, stage 1 conf vol	1274	1274		989	989							
vC2, stage 2 conf vol	518	994		674	1284							
vCu, unblocked vol	1562	2129	170	1409	2134	471	911			942		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	95	97	100	100	100	96			97		
cM capacity (veh/h)	207	196	709	231	190	539	624			724		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	0	26	621	321	19	818	428
Volume Left	19	0	26	0	0	19	0	0
Volume Right	18	0	0	0	10	0	0	19
cSH	279	1700	624	1700	1700	724	1700	1700
Volume to Capacity	0.17	0.00	0.04	0.37	0.19	0.03	0.48	0.25
Queue Length 95th (ft)	15	0	3	0	0	2	0	0
Control Delay (s)	20.5	0.0	11.0	0.0	0.0	10.1	0.0	0.0
Lane LOS	C	A	B			B		
Approach Delay (s)	20.5	0.0	0.3			0.2		
Approach LOS	C	A						

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	35	26	847	1098	27
Future Volume (Veh/h)	22	35	26	847	1098	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	38	28	921	1193	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1724	611	1222			
vC1, stage 1 conf vol	1208					
vC2, stage 2 conf vol	516					
vCu, unblocked vol	1724	611	1222			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	91	95			
cM capacity (veh/h)	225	437	566			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	28	460	460	795	427
Volume Left	24	28	0	0	0	0
Volume Right	38	0	0	0	0	29
cSH	320	566	1700	1700	1700	1700
Volume to Capacity	0.19	0.05	0.27	0.27	0.47	0.25
Queue Length 95th (ft)	18	4	0	0	0	0
Control Delay (s)	18.9	11.7	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	18.9	0.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	35	30	1159	1218	13
Future Volume (Veh/h)	36	35	30	1159	1218	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	38	37	32	1233	1296	14
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1988	659	1314			
vC1, stage 1 conf vol	1307					
vC2, stage 2 conf vol	680					
vCu, unblocked vol	1988	659	1314			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4	2.3			
p0 queue free %	80	91	94			
cM capacity (veh/h)	186	395	499			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	75	32	616	616	864	446
Volume Left	38	32	0	0	0	0
Volume Right	37	0	0	0	0	14
cSH	252	499	1700	1700	1700	1700
Volume to Capacity	0.30	0.06	0.36	0.36	0.51	0.26
Queue Length 95th (ft)	30	5	0	0	0	0
Control Delay (s)	25.2	12.7	0.0	0.0	0.0	0.0
Lane LOS	D	B				
Approach Delay (s)	25.2	0.3			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	0	20	1	0	56	7	1084	13	48	1134	72
Future Volume (Veh/h)	49	0	20	1	0	56	7	1084	13	48	1134	72
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	53	0	22	1	0	60	8	1166	14	52	1219	77
Pedestrians		4			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								910				
pX, platoon unblocked	0.82	0.82		0.82	0.82	0.82				0.82		
vC, conflicting volume	2024	2566	652	1928	2597	594	1300			1184		
vC1, stage 1 conf vol	1366	1366		1193	1193							
vC2, stage 2 conf vol	659	1200		736	1404							
vCu, unblocked vol	1815	2472	652	1698	2510	76	1300			793		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	59	100	94	100	100	92	98			92		
cM capacity (veh/h)	131	147	400	201	146	784	506			654		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	75	61	8	777	403	52	813	483
Volume Left	53	1	8	0	0	52	0	0
Volume Right	22	60	0	0	14	0	0	77
cSH	163	748	506	1700	1700	654	1700	1700
Volume to Capacity	0.46	0.08	0.02	0.46	0.24	0.08	0.48	0.28
Queue Length 95th (ft)	54	7	1	0	0	6	0	0
Control Delay (s)	44.7	10.2	12.2	0.0	0.0	11.0	0.0	0.0
Lane LOS	E	B	B			B		
Approach Delay (s)	44.7	10.2	0.1			0.4		
Approach LOS	E	B						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	272	113	177	237	311	65	657	68	264	758	140
Future Volume (vph)	180	272	113	177	237	311	65	657	68	264	758	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1722		1719	1642		1719	3380		1719	3345	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1722		1719	1642		1719	3380		1719	3345	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	191	289	120	188	252	331	69	699	72	281	806	149
RTOR Reduction (vph)	0	20	0	0	59	0	0	10	0	0	20	0
Lane Group Flow (vph)	191	389	0	188	524	0	69	761	0	281	935	0
Confl. Peds. (#/hr)	2		3	3		2	2		5	5		2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	10.7	22.2		9.8	21.3		4.0	15.4		12.1	23.5	
Effective Green, g (s)	10.7	22.2		9.8	21.3		4.0	15.4		12.1	23.5	
Actuated g/C Ratio	0.14	0.30		0.13	0.28		0.05	0.21		0.16	0.31	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	245	509		224	466		91	694		277	1048	
v/s Ratio Prot	0.11	0.23		c0.11	c0.32		0.04	c0.23		c0.16	0.28	
v/s Ratio Perm												
v/c Ratio	0.78	0.76		0.84	1.12		0.76	1.10		1.01	0.89	
Uniform Delay, d1	31.0	24.0		31.8	26.9		35.0	29.8		31.4	24.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.3	6.9		22.3	80.0		26.9	63.4		57.8	11.5	
Delay (s)	44.3	31.0		54.1	106.9		61.9	93.2		89.3	36.0	
Level of Service	D	C		D	F		E	F		F	D	
Approach Delay (s)		35.2			94.0			90.6			48.1	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	407	414	157	250	437	53	187	1262	233	112	1038	407
Future Volume (vph)	407	414	157	250	437	53	187	1262	233	112	1038	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	3206		1595	3290		1752	3505	1520	1752	3505	1538
Flt Permitted	0.95	0.99		0.95	1.00		0.09	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1595	3206		1595	3290		167	3505	1520	183	3505	1538
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	420	427	162	258	451	55	193	1301	240	115	1070	420
RTOR Reduction (vph)	0	18	0	0	6	0	0	0	61	0	0	190
Lane Group Flow (vph)	336	655	0	232	526	0	193	1301	179	115	1070	230
Confl. Peds. (#/hr)	8		1	1		8	5		13	13		5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	33.4	33.4		29.6	29.6		59.7	44.3	44.3	51.9	40.4	40.4
Effective Green, g (s)	33.4	33.4		29.6	29.6		59.7	44.3	44.3	51.9	40.4	40.4
Actuated g/C Ratio	0.24	0.24		0.21	0.21		0.43	0.32	0.32	0.37	0.29	0.29
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	383	770		339	700		247	1117	484	198	1018	447
v/s Ratio Prot	c0.21	0.20		0.15	c0.16		c0.09	c0.37		0.05	0.31	
v/s Ratio Perm							0.25		0.12	0.17		0.15
v/c Ratio	0.88	0.85		0.68	0.75		0.78	1.16	0.37	0.58	1.05	0.51
Uniform Delay, d1	50.8	50.4		50.4	51.3		35.8	47.4	36.6	34.3	49.3	41.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.1	9.2		6.1	4.9		14.8	84.2	0.7	4.3	42.6	1.3
Delay (s)	71.0	59.6		56.5	56.1		50.6	131.5	37.2	38.6	91.9	42.4
Level of Service	E	E		E	E		D	F	D	D	F	D
Approach Delay (s)		63.4			56.2			109.5			75.1	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	14	7	0	38	5	1668	31	26	1389	17
Future Volume (Veh/h)	7	0	14	7	0	38	5	1668	31	26	1389	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	7	0	15	7	0	40	5	1738	32	27	1447	18
Pedestrians		10			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh)								2				
Upstream signal (ft)								887			461	
pX, platoon unblocked	0.84	0.84	0.71	0.84	0.84	0.74	0.71			0.74		
vC, conflicting volume	2439	3304	742	2560	3297	889	1475			1774		
vC1, stage 1 conf vol	1520	1520		1768	1768							
vC2, stage 2 conf vol	919	1784		792	1529							
vCu, unblocked vol	960	1986	0	1105	1978	157	866			1349		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	98	94	100	94	99			93		
cM capacity (veh/h)	183	115	765	114	132	634	543			371		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	22	47	5	1159	611	27	965	500
Volume Left	7	7	5	0	0	27	0	0
Volume Right	15	40	0	0	32	0	0	18
cSH	380	378	543	1700	1700	371	1700	1700
Volume to Capacity	0.06	0.12	0.01	0.68	0.36	0.07	0.57	0.29
Queue Length 95th (ft)	5	11	1	0	0	6	0	0
Control Delay (s)	15.1	15.9	11.7	0.0	0.0	15.5	0.0	0.0
Lane LOS	C	C	B			C		
Approach Delay (s)	15.1	15.9	0.0			0.3		
Approach LOS	C	C						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	14	0	0	0	36	1692	1	4	1277	81
Future Volume (Veh/h)	60	5	14	0	0	0	36	1692	1	4	1277	81
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	70	6	16	0	0	0	42	1967	1	5	1485	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								680			668	
pX, platoon unblocked	0.85	0.85	0.72	0.85	0.85	0.71	0.72			0.71		
vC, conflicting volume	2610	3594	790	2823	3640	984	1579			1968		
vC1, stage 1 conf vol	1542	1542		2052	2052							
vC2, stage 2 conf vol	1068	2052		772	1589							
vCu, unblocked vol	1041	2198	0	1292	2253	157	1016			1545		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	93	98	100	100	100	91			98		
cM capacity (veh/h)	187	88	777	64	88	610	486			302		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	92	0	42	1311	657	748	836
Volume Left	70	0	42	0	0	5	0
Volume Right	16	0	0	0	1	0	94
cSH	199	1700	486	1700	1700	302	1700
Volume to Capacity	0.46	0.00	0.09	0.77	0.39	0.02	0.49
Queue Length 95th (ft)	55	0	7	0	0	1	0
Control Delay (s)	37.8	0.0	13.1	0.0	0.0	0.6	0.0
Lane LOS	E	A	B			A	
Approach Delay (s)	37.8	0.0	0.3			0.3	
Approach LOS	E	A					

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	44	75	12	40	7	47	1410	9	0	1091	111
Future Volume (vph)	151	44	75	12	40	7	47	1410	9	0	1091	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	5.5			5.5	
Lane Util. Factor		1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.96			0.98		1.00	1.00			0.99	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1713			1793		1752	3501			4953	
Flt Permitted		0.80			0.93		0.95	1.00			1.00	
Satd. Flow (perm)		1411			1685		1752	3501			4953	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	157	46	78	12	42	7	49	1469	9	0	1136	116
RTOR Reduction (vph)	0	21	0	0	5	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	260	0	0	57	0	49	1478	0	0	1240	0
Confl. Peds. (#/hr)	9		2	2		9	4		6	6		4
Confl. Bikes (#/hr)						1			3			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4								
Actuated Green, G (s)		20.1			20.1		3.0	49.9			42.4	
Effective Green, g (s)		20.1			20.1		3.0	49.9			42.4	
Actuated g/C Ratio		0.25			0.25		0.04	0.62			0.53	
Clearance Time (s)		4.5			4.5		4.5	5.5			5.5	
Vehicle Extension (s)		3.0			3.0		3.0	4.5			4.5	
Lane Grp Cap (vph)		354			423		65	2183			2625	
v/s Ratio Prot							0.03	c0.42			0.25	
v/s Ratio Perm		c0.18			0.03							
v/c Ratio		0.73			0.13		0.75	0.68			0.47	
Uniform Delay, d1		27.5			23.2		38.1	9.8			11.8	
Progression Factor		1.00			1.00		0.82	0.42			1.00	
Incremental Delay, d2		7.7			0.1		29.6	1.2			0.6	
Delay (s)		35.2			23.4		60.9	5.4			12.4	
Level of Service		D			C		E	A			B	
Approach Delay (s)		35.2			23.4			7.2			12.4	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	220	95	1396	193	74	1103
Future Volume (vph)	220	95	1396	193	74	1103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		5.5		4.5	5.5
Lane Util. Factor	1.00		0.91		1.00	0.95
Frpb, ped/bikes	1.00		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.96		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1710		4923		1752	3505
Flt Permitted	0.97		1.00		0.95	1.00
Satd. Flow (perm)	1710		4923		1752	3505
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	234	101	1485	205	79	1173
RTOR Reduction (vph)	22	0	18	0	0	0
Lane Group Flow (vph)	313	0	1672	0	79	1173
Confl. Peds. (#/hr)	8			7	7	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot		NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	19.4		39.0		7.1	50.6
Effective Green, g (s)	19.4		39.0		7.1	50.6
Actuated g/C Ratio	0.24		0.49		0.09	0.63
Clearance Time (s)	4.5		5.5		4.5	5.5
Vehicle Extension (s)	3.0		4.5		3.0	4.5
Lane Grp Cap (vph)	414		2399		155	2216
v/s Ratio Prot	c0.18		c0.34		0.05	c0.33
v/s Ratio Perm						
v/c Ratio	0.76		0.70		0.51	0.53
Uniform Delay, d1	28.1		15.9		34.8	8.1
Progression Factor	1.00		1.00		0.81	0.32
Incremental Delay, d2	7.7		1.7		2.4	0.8
Delay (s)	35.8		17.6		30.4	3.5
Level of Service	D		B		C	A
Approach Delay (s)	35.8		17.6			5.2
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	26	42	1518	1238	51
Future Volume (Veh/h)	16	26	42	1518	1238	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	17	28	45	1615	1317	54
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					760	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	2250	694	1380			
vC1, stage 1 conf vol	1353					
vC2, stage 2 conf vol	898					
vCu, unblocked vol	2077	162	1006			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	96	92			
cM capacity (veh/h)	199	686	546			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	45	45	808	808	878	493
Volume Left	17	45	0	0	0	0
Volume Right	28	0	0	0	0	54
cSH	356	546	1700	1700	1700	1700
Volume to Capacity	0.13	0.08	0.47	0.47	0.52	0.29
Queue Length 95th (ft)	11	7	0	0	0	0
Control Delay (s)	16.6	12.2	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	16.6	0.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	0	31	14	0	16	33	1348	21	9	1097	40
Future Volume (Veh/h)	51	0	31	14	0	16	33	1348	21	9	1097	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	55	0	33	15	0	17	35	1449	23	10	1180	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)											1160	
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	2033	2764	612	2174	2774	736	1223			1472		
vC1, stage 1 conf vol	1222	1222		1530	1530							
vC2, stage 2 conf vol	812	1542		643	1243							
vCu, unblocked vol	1866	2723	200	2031	2734	736	917			1472		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	100	95	86	100	95	94			98		
cM capacity (veh/h)	185	132	689	111	133	361	631			454		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	88	32	35	966	506	10	787	436
Volume Left	55	15	35	0	0	10	0	0
Volume Right	33	17	0	0	23	0	0	43
cSH	254	175	631	1700	1700	454	1700	1700
Volume to Capacity	0.35	0.18	0.06	0.57	0.30	0.02	0.46	0.26
Queue Length 95th (ft)	37	16	4	0	0	2	0	0
Control Delay (s)	26.4	30.1	11.0	0.0	0.0	13.1	0.0	0.0
Lane LOS	D	D	B			B		
Approach Delay (s)	26.4	30.1	0.3			0.1		
Approach LOS	D	D						

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	46	0	1357	1270	91
Future Volume (Veh/h)	78	46	0	1357	1270	91
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	82	48	0	1428	1337	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2099	716	1433			
vC1, stage 1 conf vol	1385					
vC2, stage 2 conf vol	714					
vCu, unblocked vol	2099	716	1433			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	54	87	100			
cM capacity (veh/h)	179	372	470			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	130	0	714	714	891	542
Volume Left	82	0	0	0	0	0
Volume Right	48	0	0	0	0	96
cSH	221	1700	1700	1700	1700	1700
Volume to Capacity	0.59	0.00	0.42	0.42	0.52	0.32
Queue Length 95th (ft)	83	0	0	0	0	0
Control Delay (s)	42.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	E					
Approach Delay (s)	42.2	0.0			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	62	48	1417	1099	56
Future Volume (Veh/h)	43	62	48	1417	1099	56
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	44	64	49	1461	1133	58
Pedestrians	11					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2002	606	1202			
vC1, stage 1 conf vol	1173					
vC2, stage 2 conf vol	828					
vCu, unblocked vol	2002	606	1202			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	85	91			
cM capacity (veh/h)	203	433	565			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	108	49	730	730	755	436
Volume Left	44	49	0	0	0	0
Volume Right	64	0	0	0	0	58
cSH	296	565	1700	1700	1700	1700
Volume to Capacity	0.36	0.09	0.43	0.43	0.44	0.26
Queue Length 95th (ft)	40	7	0	0	0	0
Control Delay (s)	23.9	12.0	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	23.9	0.4			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	1	20	20	4	122	7	1337	13	20	1016	86
Future Volume (Veh/h)	48	1	20	20	4	122	7	1337	13	20	1016	86
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	49	1	21	21	4	126	7	1378	13	21	1047	89
Pedestrians		9			7			2				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		1			1			0				
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (ft)								910				
pX, platoon unblocked	0.72	0.72		0.72	0.72	0.72				0.72		
vC, conflicting volume	1974	2554	579	1994	2592	702	1145			1398		
vC1, stage 1 conf vol	1142	1142		1406	1406							
vC2, stage 2 conf vol	831	1412		589	1187							
vCu, unblocked vol	1582	2385	579	1611	2437	0	1145			787		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	99	95	90	98	84	99			96		
cM capacity (veh/h)	187	175	451	207	175	777	595			591		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	71	151	7	919	472	21	698	438
Volume Left	49	21	7	0	0	21	0	0
Volume Right	21	126	0	0	13	0	0	89
cSH	226	527	595	1700	1700	591	1700	1700
Volume to Capacity	0.31	0.29	0.01	0.54	0.28	0.04	0.41	0.26
Queue Length 95th (ft)	32	29	1	0	0	3	0	0
Control Delay (s)	28.1	14.5	11.1	0.0	0.0	11.3	0.0	0.0
Lane LOS	D	B	B			B		
Approach Delay (s)	28.1	14.5	0.1			0.2		
Approach LOS	D	B						

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	315	83	91	274	274	144	917	202	312	589	233
Future Volume (vph)	174	315	83	91	274	274	144	917	202	312	589	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1781		1752	1706		1752	3391		1752	3322	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1781		1752	1706		1752	3391		1752	3322	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	332	87	96	288	288	152	965	213	328	620	245
RTOR Reduction (vph)	0	9	0	0	35	0	0	19	0	0	43	0
Lane Group Flow (vph)	183	410	0	96	541	0	152	1159	0	328	822	0
Confl. Peds. (#/hr)			3	3			5		3	3		5
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	10.5	27.1		8.0	24.6		7.0	30.4		19.0	42.4	
Effective Green, g (s)	10.5	27.1		8.0	24.6		7.0	30.4		19.0	42.4	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.07	0.30		0.19	0.42	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	183	482		140	419		122	1030		332	1408	
v/s Ratio Prot	c0.10	0.23		0.05	c0.32		c0.09	c0.34		c0.19	0.25	
v/s Ratio Perm												
v/c Ratio	1.00	0.85		0.69	1.29		1.25	1.13		0.99	0.58	
Uniform Delay, d1	44.8	34.5		44.8	37.7		46.5	34.8		40.4	22.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	66.5	13.8		10.5	147.5		161.8	69.2		45.6	1.8	
Delay (s)	111.3	48.3		55.3	185.2		208.3	104.0		86.0	23.8	
Level of Service	F	D		E	F		F	F		F	C	
Approach Delay (s)		67.5			166.6			115.9			40.9	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	93.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Appendix G – Cumulative plus Planned Roadway improvements Level of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	319	86	199	230	40	117	946	133	53	1172	282
Future Volume (vph)	553	319	86	199	230	40	117	946	133	53	1172	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3161		1564	3208		1719	3438	1498	1719	3438	1501
Flt Permitted	0.95	0.98		0.95	0.99		0.09	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	1564	3161		1564	3208		158	3438	1498	195	3438	1501
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	621	358	97	252	291	51	123	996	140	58	1288	310
RTOR Reduction (vph)	0	7	0	0	8	0	0	0	58	0	0	113
Lane Group Flow (vph)	354	715	0	197	389	0	123	996	82	58	1288	197
Confl. Peds. (#/hr)			4						10			9
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	34.9	34.9		24.0	24.0		57.2	45.8	45.8	48.2	41.3	41.3
Effective Green, g (s)	34.9	34.9		24.0	24.0		57.2	45.8	45.8	48.2	41.3	41.3
Actuated g/C Ratio	0.26	0.26		0.18	0.18		0.43	0.35	0.35	0.37	0.31	0.31
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	414	837		284	584		203	1194	520	151	1077	470
v/s Ratio Prot	c0.23	0.23		c0.13	0.12		c0.05	c0.29		0.02	c0.37	
v/s Ratio Perm							0.21		0.05	0.12		0.13
v/c Ratio	0.86	0.85		0.69	0.67		0.61	0.83	0.16	0.38	1.20	0.42
Uniform Delay, d1	46.0	46.0		50.5	50.2		29.9	39.5	29.7	30.3	45.3	35.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.2	8.8		7.7	3.2		5.0	5.4	0.2	1.6	97.4	0.8
Delay (s)	62.3	54.8		58.2	53.3		34.9	44.9	29.9	31.9	142.6	36.6
Level of Service	E	D		E	D		C	D	C	C	F	D
Approach Delay (s)		57.2			54.9			42.3			118.9	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	75.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	131.8	Sum of lost time (s)	20.2
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	12	0	0	22	0	1249	33	0	1391	9
Future Volume (Veh/h)	0	0	12	0	0	22	0	1249	33	0	1391	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.53	0.53	0.53	0.93	0.93	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	16	0	0	42	0	1343	35	0	1546	10
Pedestrians		4			9							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			1							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1037			461	
pX, platoon unblocked	0.77	0.77	0.69	0.77	0.77	0.84	0.69			0.84		
vC, conflicting volume	2268	2942	782	2158	2930	698	1560			1387		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1123	1995	0	981	1979	260	922			1080		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	98	100	100	93	100			100		
cM capacity (veh/h)	110	43	740	147	44	605	492			515		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	16	42	895	483	1031	525
Volume Left	0	0	0	0	0	0
Volume Right	16	42	0	35	0	10
cSH	740	605	1700	1700	1700	1700
Volume to Capacity	0.02	0.07	0.53	0.28	0.61	0.31
Queue Length 95th (ft)	2	6	0	0	0	0
Control Delay (s)	10.0	11.4	0.0	0.0	0.0	0.0
Lane LOS	A	B				
Approach Delay (s)	10.0	11.4	0.0		0.0	
Approach LOS	A	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	0	18	0	0	0	27	849	0	23	1171	36
Future Volume (Veh/h)	113	0	18	0	0	0	27	849	0	23	1171	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.92	0.89	0.92	0.92	0.92	0.89	0.89	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	127	0	20	0	0	0	30	954	0	25	1316	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								830			668	
pX, platoon unblocked	0.79	0.79	0.70	0.79	0.79	0.82	0.70			0.82		
vC, conflicting volume	1923	2400	678	1742	2420	477	1356			954		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	604	1211	0	374	1236	0	640			507		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	100	97	100	100	100	95			97		
cM capacity (veh/h)	284	132	755	403	127	890	655			865		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	147	0	30	636	318	25	877	479
Volume Left	127	0	30	0	0	25	0	0
Volume Right	20	0	0	0	0	0	0	40
cSH	310	1700	655	1700	1700	865	1700	1700
Volume to Capacity	0.47	0.00	0.05	0.37	0.19	0.03	0.52	0.28
Queue Length 95th (ft)	60	0	4	0	0	2	0	0
Control Delay (s)	26.7	0.0	10.8	0.0	0.0	9.3	0.0	0.0
Lane LOS	D	A	B			A		
Approach Delay (s)	26.7	0.0	0.3			0.2		
Approach LOS	D	A						

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	160	0	0	1	0	1080	5	0	1181	98
Future Volume (Veh/h)	0	0	160	0	0	1	0	1080	5	0	1181	98
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.56	0.56	0.56	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	176	0	0	2	0	1174	5	0	1284	107
Pedestrians		3			3						9	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		0			0						1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								150				
pX, platoon unblocked	0.74	0.74		0.74	0.74	0.74				0.74		
vC, conflicting volume	1938	2522	484	1784	2574	602	1394			1182		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1568	2356	484	1359	2425	0	1394			548		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	66	100	100	100	100			100		
cM capacity (veh/h)	52	25	516	50	22	785	465			732		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	176	2	783	396	514	514	364
Volume Left	0	0	0	0	0	0	0
Volume Right	176	2	0	5	0	0	107
cSH	516	785	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.00	0.46	0.23	0.30	0.30	0.21
Queue Length 95th (ft)	37	0	0	0	0	0	0
Control Delay (s)	15.5	9.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A					
Approach Delay (s)	15.5	9.6	0.0		0.0		
Approach LOS	C	A					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	144	0	74	36	1080	146	98	1234	0
Future Volume (vph)	0	0	0	144	0	74	36	1080	146	98	1234	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		5.5	5.5		4.5	5.5	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.98		1.00	1.00	
Flt Protected					0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1656		1770	3335		1703	3406	
Flt Permitted					0.97		0.16	1.00		0.95	1.00	
Satd. Flow (perm)					1656		296	3335		1703	3406	
Peak-hour factor, PHF	0.92	0.92	0.92	0.65	0.92	0.65	0.92	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	222	0	114	39	1149	155	107	1341	0
RTOR Reduction (vph)	0	0	0	0	108	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	228	0	39	1298	0	107	1341	0
Confl. Peds. (#/hr)									2			
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	2%	2%	2%	6%	2%	6%	2%	6%	6%	6%	6%	2%
Turn Type				Split	NA		Perm	NA		Prot	NA	
Protected Phases		4		8	8			2		1	6	
Permitted Phases	4						2					
Actuated Green, G (s)					18.9		60.0	60.0		9.1	73.6	
Effective Green, g (s)					18.9		60.0	60.0		9.1	73.6	
Actuated g/C Ratio					0.18		0.59	0.59		0.09	0.72	
Clearance Time (s)					4.5		5.5	5.5		4.5	5.5	
Vehicle Extension (s)					3.0		4.5	4.5		3.0	4.5	
Lane Grp Cap (vph)					305		173	1952		151	2445	
v/s Ratio Prot					c0.14			c0.39		c0.06	0.39	
v/s Ratio Perm							0.13					
v/c Ratio					0.75		0.23	0.66		0.71	0.55	
Uniform Delay, d1					39.5		10.2	14.4		45.4	6.7	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					9.5		3.0	1.8		14.1	0.9	
Delay (s)					49.1		13.2	16.2		59.5	7.6	
Level of Service					D		B	B		E	A	
Approach Delay (s)		0.0			49.1			16.1			11.4	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	25	0	0	14	0	1194	7	0	1267	44
Future Volume (Veh/h)	0	0	25	0	0	14	0	1194	7	0	1267	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.92	0.95	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	0	0	26	0	0	15	0	1257	8	0	1334	46
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											760	
pX, platoon unblocked	0.83	0.83	0.83	0.83	0.83		0.83					
vC, conflicting volume	2002	2623	691	1954	2642	632	1381			1265		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1794	2545	212	1737	2568	632	1045			1265		
tC, single (s)	7.6	6.5	7.0	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	96	100	100	96	100			100		
cM capacity (veh/h)	39	22	646	44	21	423	528			545		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	15	838	427	889	491
Volume Left	0	0	0	0	0	0
Volume Right	26	15	0	8	0	46
cSH	646	423	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.49	0.25	0.52	0.29
Queue Length 95th (ft)	3	3	0	0	0	0
Control Delay (s)	10.8	13.8	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.8	13.8	0.0		0.0	
Approach LOS	B	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	42	0	0	0	23	856	26	0	1128	17
Future Volume (Veh/h)	0	0	42	0	0	0	23	856	26	0	1128	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	47	0	0	0	26	951	29	0	1253	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1160	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1790	2294	636	1691	2290	490	1272			980		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1595	2181	256	1480	2175	490	994			980		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	93	100	100	100	96			100		
cM capacity (veh/h)	60	37	640	67	38	524	596			700		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	47	0	26	634	346	835	437
Volume Left	0	0	26	0	0	0	0
Volume Right	47	0	0	0	29	0	19
cSH	640	1700	596	1700	1700	1700	1700
Volume to Capacity	0.07	0.00	0.04	0.37	0.20	0.49	0.26
Queue Length 95th (ft)	6	0	3	0	0	0	0
Control Delay (s)	11.1	0.0	11.3	0.0	0.0	0.0	0.0
Lane LOS	B	A	B				
Approach Delay (s)	11.1	0.0	0.3			0.0	
Approach LOS	B	A					

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	57	26	869	1098	27
Future Volume (Veh/h)	0	57	26	869	1098	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	62	28	945	1193	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1736	611	1222			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1736	611	1222			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	86	95			
cM capacity (veh/h)	75	437	566			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	28	472	472	795	427
Volume Left	0	28	0	0	0	0
Volume Right	62	0	0	0	0	29
cSH	437	566	1700	1700	1700	1700
Volume to Capacity	0.14	0.05	0.28	0.28	0.47	0.25
Queue Length 95th (ft)	12	4	0	0	0	0
Control Delay (s)	14.6	11.7	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.6	0.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	72	30	1194	1218	13
Future Volume (Veh/h)	0	72	30	1194	1218	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	77	32	1270	1296	14
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2006	659	1314			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2006	659	1314			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	100	81	94			
cM capacity (veh/h)	46	395	499			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	77	32	635	635	864	446
Volume Left	0	32	0	0	0	0
Volume Right	77	0	0	0	0	14
cSH	395	499	1700	1700	1700	1700
Volume to Capacity	0.19	0.06	0.37	0.37	0.51	0.26
Queue Length 95th (ft)	18	5	0	0	0	0
Control Delay (s)	16.3	12.7	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	16.3	0.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	20	0	0	57	0	1127	61	0	1219	72
Future Volume (Veh/h)	0	0	20	0	0	57	0	1127	61	0	1219	72
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	22	0	0	61	0	1212	66	0	1311	77
Pedestrians		4			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								910				
pX, platoon unblocked	0.82	0.82		0.82	0.82	0.82				0.82		
vC, conflicting volume	2020	2636	698	1926	2641	643	1392			1282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1804	2555	698	1689	2562	122	1392			902		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	94	100	100	92	100			100		
cM capacity (veh/h)	35	20	372	44	20	729	465			591		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	22	61	808	470	874	514
Volume Left	0	0	0	0	0	0
Volume Right	22	61	0	66	0	77
cSH	372	729	1700	1700	1700	1700
Volume to Capacity	0.06	0.08	0.48	0.28	0.51	0.30
Queue Length 95th (ft)	5	7	0	0	0	0
Control Delay (s)	15.3	10.4	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	15.3	10.4	0.0		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	272	113	177	237	311	65	657	68	264	758	140
Future Volume (vph)	180	272	113	177	237	311	65	657	68	264	758	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1722		1719	1642		1719	3380		1719	3345	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1722		1719	1642		1719	3380		1719	3345	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	191	289	120	188	252	331	69	699	72	281	806	149
RTOR Reduction (vph)	0	20	0	0	59	0	0	10	0	0	20	0
Lane Group Flow (vph)	191	389	0	188	524	0	69	761	0	281	935	0
Confl. Peds. (#/hr)	2		3	3		2	2		5	5		2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	10.7	22.2		9.8	21.3		4.0	15.4		12.1	23.5	
Effective Green, g (s)	10.7	22.2		9.8	21.3		4.0	15.4		12.1	23.5	
Actuated g/C Ratio	0.14	0.30		0.13	0.28		0.05	0.21		0.16	0.31	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	245	509		224	466		91	694		277	1048	
v/s Ratio Prot	0.11	0.23		c0.11	c0.32		0.04	c0.23		c0.16	0.28	
v/s Ratio Perm												
v/c Ratio	0.78	0.76		0.84	1.12		0.76	1.10		1.01	0.89	
Uniform Delay, d1	31.0	24.0		31.8	26.9		35.0	29.8		31.4	24.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.3	6.9		22.3	80.0		26.9	63.4		57.8	11.5	
Delay (s)	44.3	31.0		54.1	106.9		61.9	93.2		89.3	36.0	
Level of Service	D	C		D	F		E	F		F	D	
Approach Delay (s)		35.2			94.0			90.6			48.1	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	407	414	157	250	437	53	193	1262	233	112	1038	407
Future Volume (vph)	407	414	157	250	437	53	193	1262	233	112	1038	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Lane Util. Factor	0.91	0.91		0.91	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	3206		1595	3290		1752	3505	1520	1752	3505	1538
Flt Permitted	0.95	0.99		0.95	1.00		0.09	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1595	3206		1595	3290		165	3505	1520	183	3505	1538
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	420	427	162	258	451	55	199	1301	240	115	1070	420
RTOR Reduction (vph)	0	18	0	0	6	0	0	0	61	0	0	190
Lane Group Flow (vph)	336	655	0	232	526	0	199	1301	179	115	1070	230
Confl. Peds. (#/hr)	8		1	1		8	5		13	13		5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	33.4	33.4		29.6	29.6		60.4	44.6	44.6	51.8	40.3	40.3
Effective Green, g (s)	33.4	33.4		29.6	29.6		60.4	44.6	44.6	51.8	40.3	40.3
Actuated g/C Ratio	0.24	0.24		0.21	0.21		0.43	0.32	0.32	0.37	0.29	0.29
Clearance Time (s)	5.3	5.3		5.3	5.3		4.6	5.0	5.0	4.6	5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	382	768		338	699		251	1122	486	197	1014	444
v/s Ratio Prot	c0.21	0.20		0.15	c0.16		c0.09	c0.37		0.05	0.31	
v/s Ratio Perm							0.25		0.12	0.17		0.15
v/c Ratio	0.88	0.85		0.69	0.75		0.79	1.16	0.37	0.58	1.06	0.52
Uniform Delay, d1	51.0	50.6		50.6	51.4		36.6	47.4	36.5	34.5	49.5	41.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.4	9.4		6.2	4.9		15.7	82.0	0.6	4.4	44.0	1.4
Delay (s)	71.5	60.0		56.7	56.3		52.3	129.3	37.2	38.8	93.5	42.7
Level of Service	E	E		E	E		D	F	D	D	F	D
Approach Delay (s)		63.8			56.4			107.8			76.3	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	139.3	Sum of lost time (s)	20.2
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	21	0	0	38	0	1635	57	0	1415	22
Future Volume (Veh/h)	0	0	21	0	0	38	0	1635	57	0	1415	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	22	0	0	40	0	1703	59	0	1474	23
Pedestrians		10			4							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		3.5			3.5							
Percent Blockage		1			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1037			461	
pX, platoon unblocked	0.76	0.76	0.72	0.76	0.76	0.62	0.72			0.62		
vC, conflicting volume	2387	3262	758	2496	3244	885	1507			1766		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	515	1664	0	657	1640	0	914			1007		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	94	100			100		
cM capacity (veh/h)	309	71	767	254	74	667	521			418		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	22	40	1135	627	983	514
Volume Left	0	0	0	0	0	0
Volume Right	22	40	0	59	0	23
cSH	767	667	1700	1700	1700	1700
Volume to Capacity	0.03	0.06	0.67	0.37	0.58	0.30
Queue Length 95th (ft)	2	5	0	0	0	0
Control Delay (s)	9.8	10.7	0.0	0.0	0.0	0.0
Lane LOS	A	B				
Approach Delay (s)	9.8	10.7	0.0		0.0	
Approach LOS	A	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	5	14	0	0	0	77	1622	1	16	1271	81
Future Volume (Veh/h)	135	5	14	0	0	0	77	1622	1	16	1271	81
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	157	6	16	0	0	0	90	1886	1	19	1478	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								830			668	
pX, platoon unblocked	0.70	0.70	0.72	0.70	0.70	0.56	0.72			0.56		
vC, conflicting volume	2686	3630	786	2862	3676	944	1572			1887		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	729	2082	0	982	2149	0	1010			1000		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	12	79	98	100	100	100	82			95		
cM capacity (veh/h)	179	28	778	97	26	603	489			383		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	179	0	90	1257	630	19	985	587
Volume Left	157	0	90	0	0	19	0	0
Volume Right	16	0	0	0	1	0	0	94
cSH	162	1700	489	1700	1700	383	1700	1700
Volume to Capacity	1.11	0.00	0.18	0.74	0.37	0.05	0.58	0.35
Queue Length 95th (ft)	234	0	17	0	0	4	0	0
Control Delay (s)	159.6	0.0	14.0	0.0	0.0	14.9	0.0	0.0
Lane LOS	F	A	B			B		
Approach Delay (s)	159.6	0.0	0.6			0.2		
Approach LOS	F	A						

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	195	0	0	7	0	1486	9	0	1091	111
Future Volume (Veh/h)	0	0	195	0	0	7	0	1486	9	0	1091	111
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	203	0	0	7	0	1548	9	0	1136	116
Pedestrians		4			6			2			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								154				
pX, platoon unblocked	0.53	0.53		0.53	0.53	0.53				0.53		
vC, conflicting volume	1988	2761	443	2142	2814	794	1256			1563		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1091	2549	443	1382	2650	0	1256			289		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	64	100	100	99	100			100		
cM capacity (veh/h)	86	14	557	34	12	565	542			665		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	203	7	1032	525	454	454	343
Volume Left	0	0	0	0	0	0	0
Volume Right	203	7	0	9	0	0	116
cSH	557	565	1700	1700	1700	1700	1700
Volume to Capacity	0.36	0.01	0.61	0.31	0.27	0.27	0.20
Queue Length 95th (ft)	41	1	0	0	0	0	0
Control Delay (s)	15.1	11.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B					
Approach Delay (s)	15.1	11.5	0.0		0.0		
Approach LOS	C	B					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	226	0	135	57	1471	193	118	1179	0
Future Volume (vph)	0	0	0	226	0	135	57	1471	193	118	1179	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.5		5.5	5.5		4.5	5.5	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.98		1.00	1.00	
Flt Protected					0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1698		1770	3428		1752	3505	
Flt Permitted					0.97		0.17	1.00		0.95	1.00	
Satd. Flow (perm)					1698		320	3428		1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.92	0.94	0.92	0.94	0.94	0.94	0.94	0.92
Adj. Flow (vph)	0	0	0	240	0	144	62	1565	205	126	1254	0
RTOR Reduction (vph)	0	0	0	0	105	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	0	62	1764	0	126	1254	0
Confl. Peds. (#/hr)				8					7	7		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	3%	2%	3%	3%	3%	3%	2%
Turn Type				Split	NA		Perm	NA		Prot	NA	
Protected Phases		4		8	8			2		1	6	
Permitted Phases	4						2					
Actuated Green, G (s)					21.8		56.9	56.9		9.3	70.7	
Effective Green, g (s)					21.8		56.9	56.9		9.3	70.7	
Actuated g/C Ratio					0.21		0.56	0.56		0.09	0.69	
Clearance Time (s)					4.5		5.5	5.5		4.5	5.5	
Vehicle Extension (s)					3.0		4.5	4.5		3.0	4.5	
Lane Grp Cap (vph)					361		177	1902		158	2417	
v/s Ratio Prot					c0.16			c0.51		c0.07	0.36	
v/s Ratio Perm							0.19					
v/c Ratio					0.77		0.35	0.93		0.80	0.52	
Uniform Delay, d1					38.0		12.6	20.9		45.7	7.7	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					9.9		5.4	9.4		23.7	0.8	
Delay (s)					47.9		18.0	30.3		69.4	8.5	
Level of Service					D		B	C		E	A	
Approach Delay (s)		0.0			47.9			29.9			14.0	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	19.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	42	0	0	9	0	1564	1	0	1254	92
Future Volume (Veh/h)	0	0	42	0	0	9	0	1564	1	0	1254	92
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.92	0.94	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.94	0.94
Hourly flow rate (vph)	0	0	45	0	0	10	0	1664	1	0	1334	98
Pedestrians		9										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											760	
pX, platoon unblocked	0.82	0.82	0.82	0.82	0.82		0.82					
vC, conflicting volume	2234	3057	725	2376	3106	832	1441			1665		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2071	3069	240	2244	3128	832	1109			1665		
tC, single (s)	7.6	6.5	7.0	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	93	100	100	97	100			100		
cM capacity (veh/h)	24	10	619	17	9	312	506			382		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	10	1109	556	889	543
Volume Left	0	0	0	0	0	0
Volume Right	45	10	0	1	0	98
cSH	619	312	1700	1700	1700	1700
Volume to Capacity	0.07	0.03	0.65	0.33	0.52	0.32
Queue Length 95th (ft)	6	2	0	0	0	0
Control Delay (s)	11.3	16.9	0.0	0.0	0.0	0.0
Lane LOS	B	C				
Approach Delay (s)	11.3	16.9	0.0		0.0	
Approach LOS	B	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	82	0	0	30	33	1426	30	0	1121	40
Future Volume (Veh/h)	0	0	82	0	0	30	33	1426	30	0	1121	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	88	0	0	32	35	1533	32	0	1205	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											1160	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	2095	2862	624	2310	2867	782	1248			1565		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1953	2840	251	2201	2846	782	973			1565		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	86	100	100	90	94			100		
cM capacity (veh/h)	29	14	647	18	14	337	609			418		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	88	32	35	1022	543	803	445
Volume Left	0	0	35	0	0	0	0
Volume Right	88	32	0	0	32	0	43
cSH	647	337	609	1700	1700	1700	1700
Volume to Capacity	0.14	0.10	0.06	0.60	0.32	0.47	0.26
Queue Length 95th (ft)	12	8	5	0	0	0	0
Control Delay (s)	11.4	16.8	11.3	0.0	0.0	0.0	0.0
Lane LOS	B	C	B				
Approach Delay (s)	11.4	16.8	0.2			0.0	
Approach LOS	B	C					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	124	0	1357	1348	91
Future Volume (Veh/h)	0	124	0	1357	1348	91
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	131	0	1428	1419	96
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2181	758	1515			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2181	758	1515			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	63	100			
cM capacity (veh/h)	39	350	437			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	131	0	714	714	946	569
Volume Left	0	0	0	0	0	0
Volume Right	131	0	0	0	0	96
cSH	350	1700	1700	1700	1700	1700
Volume to Capacity	0.37	0.00	0.42	0.42	0.56	0.33
Queue Length 95th (ft)	42	0	0	0	0	0
Control Delay (s)	21.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	21.3	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	105	48	1460	1099	56
Future Volume (Veh/h)	0	105	48	1460	1099	56
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	108	49	1505	1133	58
Pedestrians	11					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2024	606	1202			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2024	606	1202			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	75	91			
cM capacity (veh/h)	45	433	565			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	108	49	752	752	755	436
Volume Left	0	49	0	0	0	0
Volume Right	108	0	0	0	0	58
cSH	433	565	1700	1700	1700	1700
Volume to Capacity	0.25	0.09	0.44	0.44	0.44	0.26
Queue Length 95th (ft)	24	7	0	0	0	0
Control Delay (s)	16.1	12.0	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	16.1	0.4			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	20	0	0	146	0	1387	33	0	1078	86
Future Volume (Veh/h)	0	0	20	0	0	146	0	1387	33	0	1078	86
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	21	0	0	151	0	1430	34	0	1111	89
Pedestrians		9			7			2				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		1			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								910				
pX, platoon unblocked	0.72	0.72		0.72	0.72	0.72				0.72		
vC, conflicting volume	2030	2636	611	2032	2663	739	1209			1471		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1653	2494	611	1656	2532	0	1209			876		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	95	100	100	80	100			100		
cM capacity (veh/h)	36	20	430	43	19	773	562			543		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	151	953	511	741	459
Volume Left	0	0	0	0	0	0
Volume Right	21	151	0	34	0	89
cSH	430	773	1700	1700	1700	1700
Volume to Capacity	0.05	0.20	0.56	0.30	0.44	0.27
Queue Length 95th (ft)	4	18	0	0	0	0
Control Delay (s)	13.8	10.8	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	13.8	10.8	0.0		0.0	
Approach LOS	B	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	315	83	91	274	274	144	917	202	312	589	233
Future Volume (vph)	174	315	83	91	274	274	144	917	202	312	589	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1781		1752	1706		1752	3391		1752	3322	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1781		1752	1706		1752	3391		1752	3322	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	332	87	96	288	288	152	965	213	328	620	245
RTOR Reduction (vph)	0	9	0	0	35	0	0	19	0	0	43	0
Lane Group Flow (vph)	183	410	0	96	541	0	152	1159	0	328	822	0
Confl. Peds. (#/hr)			3	3			5		3	3		5
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	10.5	27.1		8.0	24.6		7.0	30.4		19.0	42.4	
Effective Green, g (s)	10.5	27.1		8.0	24.6		7.0	30.4		19.0	42.4	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.07	0.30		0.19	0.42	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	0.5	3.5		0.5	3.5		0.5	3.5		0.5	3.5	
Lane Grp Cap (vph)	183	482		140	419		122	1030		332	1408	
v/s Ratio Prot	c0.10	0.23		0.05	c0.32		c0.09	c0.34		c0.19	0.25	
v/s Ratio Perm												
v/c Ratio	1.00	0.85		0.69	1.29		1.25	1.13		0.99	0.58	
Uniform Delay, d1	44.8	34.5		44.8	37.7		46.5	34.8		40.4	22.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	66.5	13.8		10.5	147.5		161.8	69.2		45.6	1.8	
Delay (s)	111.3	48.3		55.3	185.2		208.3	104.0		86.0	23.8	
Level of Service	F	D		E	F		F	F		F	C	
Approach Delay (s)		67.5			166.6			115.9			40.9	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	93.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Appendix H - Cumulative plus Planned Roadway Improvements – Mitigations

Appendix H - Cumulative plus Planned Roadway Improvements – Mitigations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	5	14	0	0	0	77	1622	1	16	1271	81
Future Volume (vph)	135	5	14	0	0	0	77	1622	1	16	1271	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5					4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frt		0.99					1.00	1.00		1.00	0.99	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1763					1770	3539		1770	3507	
Flt Permitted		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1763					1770	3539		1770	3507	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	157	6	16	0	0	0	90	1886	1	19	1478	94
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	176	0	0	0	0	90	1887	0	19	1569	0
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8								
Actuated Green, G (s)		14.1					7.5	62.1		1.8	56.4	
Effective Green, g (s)		14.1					7.5	62.1		1.8	56.4	
Actuated g/C Ratio		0.15					0.08	0.68		0.02	0.62	
Clearance Time (s)		4.5					4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		271					145	2401		34	2161	
v/s Ratio Prot		c0.10					c0.05	c0.53		0.01	0.45	
v/s Ratio Perm												
v/c Ratio		0.65					0.62	0.79		0.56	0.73	
Uniform Delay, d1		36.4					40.6	10.1		44.5	12.2	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.5					8.0	1.8		18.4	1.2	
Delay (s)		41.9					48.6	11.9		62.9	13.4	
Level of Service		D					D	B		E	B	
Approach Delay (s)		41.9			0.0			13.6			14.0	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix I – Traffic Index Analysis

Existing Conditions - Northbound
20 Year Traffic Index

Crows Landing Road North of Olivero Road

Total estimated average daily traffic (ADT) = 15,049

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	664	916,320
3-axle trucks	3,680	387	1,424,160
4-axle trucks	5,880	14	82,320
5-axle trucks (or more)	13,780	520	7,165,600
Totals			9,588,400
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Northbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 19,576

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	864	1,191,962
3-axle trucks	3,680	503	1,852,568
4-axle trucks	5,880	18	107,083
5-axle trucks (or more)	13,780	676	9,321,117
Totals			12,472,731
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Conditions - Southbound
20 Year Traffic Index

Crows Landing Road North of Olivero Road

Total estimated average daily traffic (ADT) = 14,674

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	565	779,700
3-axle trucks	3,680	179	658,720
4-axle trucks	5,880	59	346,920
5-axle trucks (or more)	13,780	413	5,691,140
Totals			7,476,480
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Southbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 19,088

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	735	1,014,245
3-axle trucks	3,680	233	856,873
4-axle trucks	5,880	77	451,279
5-axle trucks (or more)	13,780	537	7,403,118
Totals			9,725,514
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Source: TJKM

Existing Conditions - Northbound
20 Year Traffic Index

Crows Landing Road North of Colusa Ave
Total estimated average daily traffic (ADT) = 13,620

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	732	1,010,160
3-axle trucks	3,680	202	743,360
4-axle trucks	5,880	32	188,160
5-axle trucks (or more)	13,780	275	3,789,500
Totals			5,731,180
Traffic Index (TI) for 20 Year Design			**11.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Northbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 17,717

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	952	1,314,031
3-axle trucks	3,680	263	966,974
4-axle trucks	5,880	42	244,761
5-axle trucks (or more)	13,780	358	4,929,437
Totals			7,455,203
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Conditions - Southbound
20 Year Traffic Index

Crows Landing Road North of Colusa Ave
Total estimated average daily traffic (ADT) = 14,206

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	735	1,014,300
3-axle trucks	3,680	230	846,400
4-axle trucks	5,880	43	252,840
5-axle trucks (or more)	13,780	413	5,691,140
Totals			7,804,680
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Southbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 18,479

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	956	1,319,416
3-axle trucks	3,680	299	1,101,009
4-axle trucks	5,880	56	328,898
5-axle trucks (or more)	13,780	537	7,403,118
Totals			10,152,442
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Source: TJKM

Existing Conditions - Northbound
20 Year Traffic Index

Crows Landing Road North of Imperial Ave
Total estimated average daily traffic (ADT) = 13,198

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	807	1,113,660
3-axle trucks	3,680	377	1,387,360
4-axle trucks	5,880	41	241,080
5-axle trucks (or more)	13,780	405	5,580,900
Totals			8,323,000
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Northbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 17,168

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	1050	1,448,665
3-axle trucks	3,680	490	1,804,698
4-axle trucks	5,880	53	313,600
5-axle trucks (or more)	13,780	527	7,259,716
Totals			10,826,680
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Conditions - Southbound
20 Year Traffic Index

Crows Landing Road North of Imperial Ave
Total estimated average daily traffic (ADT) = 14,019

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	1157	1,596,660
3-axle trucks	3,680	184	677,120
4-axle trucks	5,880	27	158,760
5-axle trucks (or more)	13,780	326	4,492,280
Totals			6,924,820
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Southbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 18,236

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	1505	2,076,959
3-axle trucks	3,680	239	880,808
4-axle trucks	5,880	35	206,517
5-axle trucks (or more)	13,780	424	5,843,623
Totals			9,007,907
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Source: TJKM

Existing Conditions - Northbound
20 Year Traffic Index

Crows Landing Road North of Algen Avenue

Total estimated average daily traffic (ADT) = 12,422

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	871	1,201,980
3-axle trucks	3,680	149	548,320
4-axle trucks	5,880	30	176,400
5-axle trucks (or more)	13,780	419	5,773,820
Totals			7,700,520
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Northbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 16,159

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	1133	1,563,553
3-axle trucks	3,680	194	713,263
4-axle trucks	5,880	39	229,464
5-axle trucks (or more)	13,780	545	7,510,669
Totals			10,016,949
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Conditions - Southbound
20 Year Traffic Index

Crows Landing Road North of Algen Avenue

Total estimated average daily traffic (ADT) = 12,766

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	796	1,098,480
3-axle trucks	3,680	138	507,840
4-axle trucks	5,880	34	199,920
5-axle trucks (or more)	13,780	427	5,884,060
Totals			7,690,300
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Southbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 16,606

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	1035	1,428,919
3-axle trucks	3,680	180	660,606
4-axle trucks	5,880	44	260,059
5-axle trucks (or more)	13,780	555	7,654,071
Totals			10,003,655
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Source: TJKM

Existing Conditions - Northbound
20 Year Traffic Index

Crows Landing Road North of Whitmore Avenue
Total estimated average daily traffic (ADT) = 12,176

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	753	1,039,140
3-axle trucks	3,680	146	537,280
4-axle trucks	5,880	33	194,040
5-axle trucks (or more)	13,780	399	5,498,220
Totals			7,268,680
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Northbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 15,839

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - NB*	*Total 20 Year ESAL*
2-axle trucks	1,380	980	1,351,728
3-axle trucks	3,680	190	698,902
4-axle trucks	5,880	43	252,410
5-axle trucks (or more)	13,780	519	7,152,165
Totals			9,455,205
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Conditions - Southbound
20 Year Traffic Index

Crows Landing Road North of Whitmore Avenue
Total estimated average daily traffic (ADT) = 12,570

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	724	999,120
3-axle trucks	3,680	394	1,449,920
4-axle trucks	5,880	20	117,600
5-axle trucks (or more)	13,780	408	5,622,240
Totals			8,188,880
Traffic Index (TI) for 20 Year Design			**11.5**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Year 2040 Cumulative Conditions - Southbound
20 Year Traffic Index

Total estimated average daily traffic (ADT) = 16,351

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks - SB*	*Total 20 Year ESAL*
2-axle trucks	1,380	942	1,299,670
3-axle trucks	3,680	513	1,886,077
4-axle trucks	5,880	26	152,976
5-axle trucks (or more)	13,780	531	7,313,492
Totals			10,652,215
Traffic Index (TI) for 20 Year Design			**12.0**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Source: TJKM