January 31, 2020

To: All Interested and Qualified Environmental Consulting Firms

Subject: Request for Proposals for Environmental Services for the Proposed Commerce Plaza Commercial Project – CEQA Analysis Services

The City of Orland invites qualified environmental firms to submit proposals for environmental services for the proposed Commerce Plaza ("Project", "Proposed Project"). The Proposed Project is summarized as follows:

The Project will be located on ±4.2 acres of land on two separate parcels (APNs 045-170-041 and 045-170-042). The two parcels are within the City of Orland. Potential commercial development at the Project site may include a range of typical commercial uses. At this time, the Applicant has requested approval from the City of Orland for the following uses: two 2,000 sq. ft. restaurants and a 4,500 sq. ft. restaurant on parcel A and a 3,400 sq. ft. convenience store and restaurant with fueling bays and a car wash on parcel B. **Table 1** summarizes the proposed development components.

Table 1. Proposed Development Components

Parcel	Use	Square Footage
A	Restaurant	2,000 sq. ft.
	Restaurant	2,000 sq. ft.
	Restaurant	4,500 sq. ft.
B	Convenience Store & Restaurant	3,400 sq. ft.
	Fueling Bays	Unknown
	Car Wash	Unknown

Environmental services for this project include, but are not limited to, California Environmental Quality Act ("CEQA") compliance documentation. Based on the findings of the Initial Study (IS) prepared for the Project (**Attachment E**), the Project may require either an Environmental Impact Report (EIR) or a Mitigated Negative Declaration (MND). The type of environmental document may in part be determined by the results of the technical studies required for the Project. A traffic study has been completed for the Project (**Attachment D**) and technical studies for biological resources, cultural resources, air quality (including a health risk assessment), greenhouse gas emissions, and noise likely will need to be performed to evaluate potential impacts in these areas.

The selection process will include the firm's experience in performing environmental services on projects of a similar size and scope, past client satisfaction and recommendations, time commitment and quality of the proposal. Proposals shall be presented in accordance with the specified RFP requirements set forth herein. Supplementary material such as exhibits, biographical information and other documentation may also be submitted separately bound from the proposal.

To be considered, four (4) copies of sealed proposal and one (1) electronic copy shall be submitted **no later than 4:30 p.m., Friday, February 28, 2020,** to:

City of Orland
Planning Department
City Hall, 815 Fourth Street,
Orland, CA 95963
Attention: Scott Friend

Any and all questions should be e-mailed to cityplanner@cityoforland.com to the attention of Scott Friend no later than Friday, February 14th to allow time for a response and response distribution. Answers to questions will be shared with all firms that have obtained the RFP document via posting to the City's website. To ensure receipt of notifications regarding this proposal, and to have the proposal considered valid, **this document must be obtained directly from the City.**

This solicitation does not commit the City to pay any costs incurred in the preparation and presentation of submittals or to select any consultant who responds. This solicitation covers only the work described herein and does not commit the City to any work beyond that described.

Sincerely,

Scott Friend, AICP
City Planner

Attachments:
Attachment A - Project Location
Attachment B - Conceptual Development Plan
Attachment C - Traffic Study
Attachment D - CEQA Initial Study (City Prepared)

Planning Department

Mailing Address
City of Orland
Planning Department
City Hall, 815 Fourth Street,
Orland, CA 95963
Attention: Scott Friend
Ph: (530) 865-1608

REQUEST FOR PROPOSALS FOR
ENVIRONMENTAL SERVICES
SCOPE OF SERVICES

Project Information

The Project description is subject to change, but is currently planned as follows:

Project Location

The ±4.2-acre site for the **Commerce Plaza Commercial Project ("Project", "Proposed Project")** is located on Commerce Lane in the City of Orland.

Existing Uses

The Project site is currently undeveloped. The site is currently covered in weeds and grasses which are managed by regular controlled burns. The Project site was previously utilized for organic strawberry cultivation.

Surrounding Uses

Land uses surrounding the Proposed Project site include agriculture, commercial, and residential uses. Specifically, the Project site is bounded by Newville Road to the north with the commercial uses of a gas station, fast-food and sit-down restaurants, and offices beyond; the Pilot Flying J truck stop and Interstate 5 (I-5) are located to the east; Ide Road is located to the south with a single-family home, pastureland, and vacant land beyond; and low-density rural residential dwellings are located to the west, including agricultural uses. Northwest of the Project site, across Newville Road, is a mobile home park. Eagles Hall is located northwest of the Project site and to the west is an active orchard surrounding a rural single-family residential dwelling and a developed single-family dwelling set back from Newville Road. A hotel is proposed on the ±1.36-acre parcel directly adjacent to the southern border of parcel A and eastern border of parcel B.

Proposed Development

The Project applicant has requested approval from the City of Orland for the construction of a 3,400 sq. ft. convenience store with a restaurant located inside, with fueling bays and a car wash on parcel A. The applicant has requested three total restaurants on parcel B: two 2,000 sq. ft. restaurants and a 4,500 sq. ft. restaurant. The development types proposed by the applicant are consistent with the surrounding commercial developments.

Parcel A (APN 045-170-041):

The proposed development would include the following on parcel A: a 3,400 sq. ft. convenience store and restaurant with an associated car wash and an unspecified number of vehicle fueling bays. The parcel would be fully paved aside from a vegetative border surrounding the entirety of the ±1.6-acre parcel. The site would include approximately 14 parking spaces.

Parcel B (APN 045-170-042):

The proposed development would include the following on parcel B: a 2,000 sq. ft. restaurant at the north end, a 4,500 sq. ft. restaurant in the center of the parcel, on the western edge, and a 2,000 sq. ft. restaurant on the southern end. The ±2.6-acre parcel would be fully paved aside from a vegetative border surrounding the parcel and several trees located and vegetated areas located near proposed parking. The parcel would include approximately 115 parking spaces.

The center of the site would include a new ±245 ft. long driveway, Commerce Court, with a fountain and roundabout located in the center of the parcels. See **Attachment C- Conceptual Development Plan.**

The Project construction specifications, brand names of proposed developments, number of anticipated employees, and the hours of operation are not yet known.

The scope of services as set forth in this Request for Proposals indicates the tasks which the City anticipates the successful proposer to perform. This RFP is presented with the primary purpose of allowing the comparison of proposals received from environmental consulting firms. The precise scope of services in the Professional Services Agreement shall be negotiated between the City and the successful Proposer. Rather than present an all-inclusive scope of services for the consultant to perform, interested firms should develop their own specific scope of work following the most up-to-date industry practices. However, as a minimum, the following professional scopes of services are anticipated to be needed, but not limited to:

A. Completion of CEQA compliance process and required documentation and noticing for the project (including an EIR or MND)
B. Assist with use permit to allow for the fire station and related facilities
C. Coordinate with architect for design review

The successful firm will act as the lead consultant to manage the CEQA compliance process pursuant to Section 16053 of State CEQA Guidelines, which includes preparing all required notices and environmental impact assessments, any necessary consultations with resource agencies and identification of applicable permits and approvals that would be required to implement the Project.

Project Initiation Schedule

Table 2. Project Initiation Schedule

RFP Available from City	Friday, January 30, 2020
Last Day to Submit Written (E-mailed) Questions	Friday, Friday 14, 2020
Proposals Due, 4:30 p.m.	Friday, February 28, 2020
Anticipated Award of Contract	March 2020
Anticipated Notice to Proceed	March 2020

Project Management

The selected firm shall assign a person to manage all aspects of this agreement and shall not change or reassign said person without prior written notice to the City, nor replace individuals with whom the City has a reasonable objection. The assigned project manager will be the primary contact throughout the process. The project manager and other key personnel associated with specific disciplines shall meet with the City as needed. Meetings will be scheduled, if needed and the content of these meeting will be coordinated through the City. The project manager for this project will also be available to participate in public workshops and to attend various meetings with affected jurisdictions and agencies as needed.

REQUEST FOR PROPOSALS FOR
ENVIRONMENTAL SERVICES
SCOPE OF SERVICES

Scope of Work

- Selected environmental consultant will develop and prepare the CEQA analysis and appropriate CEQA documents for the project in consultation with the City and the Applicant.
- Payment for CEQA analysis and documents will be based on an hourly rate. The City expects that payment will be based on time and materials required.
- If requested, the City will provide further information about the Project and known potential environmental impacts of the project.
- The contract will be structured in phases with Task Orders to be issued for each of the required stages of the CEQA analysis. The first Task Order will be for the preparation of technical studies. The Initial Study determined that technical studies may be needed for biological resources, cultural resources, air quality (with health risk assessment), greenhouse gas emissions, and noise.
- Based on the potential for significant impacts, the environmental consultant will prepare wither an EIR or MND, as appropriate (Task Order Two).

Task Order One

Prepare recommended technical studies as deemed necessary by the environmental consultant. Based on the findings of the Initial Study, the following technical studies are recommended:

1. Biological resources
2. Cultural resources
3. Air quality (with health risk assessment)
4. Greenhouse gas emissions (may be combined in a single report with Air Quality)
5. Noise

Task Order Two

Mitigated Negative Declaration (Path 1); OR Environmental Impact Report (Path 2):

1. If necessary, prepare a Notice of Preparation (NOP), including a project description and list of probable environmental effects of the project. In addition, the contractor will review and assess NOP comments and prepare responses.

2. Prepare an administrative draft of the environmental document for internal City staff review and comment.

3. Incorporate City comments into the draft environmental document. The draft environmental document will include all sections required by CEQA.

4. Circulate the draft document for public and stakeholder review and comment.

5. Confer with potential affected stakeholders and other members of the public and respond to comments. Coordinate with affected public agencies, address concerns and respond to comments.

6. Prepare written responses to comments received during the environmental document public review period. The environmental document will include a list of persons, organizations, and agencies that submitted comments.

7. If necessary, prepare a Mitigation Monitoring and Reporting Program (MMRP) to ensure the implementation of measures identified to mitigate any adverse environmental effects of the project. The MMRP shall be included in the environmental document as an appendix.

8. Prepare findings and statement of overriding considerations (if applicable) for approval by the City.


Newville Rd
Project Location
200
13
Co Rd Hh
© 2018 Google

Map Date: *10/30/19*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Conceptual Development Plan

TRAFFIC IMPACT ANALYSIS

FOR

COMMERCE LANE PLAZA

Orland, CA

Prepared For:

Land Developers, Inc.
60 Independence Circle #203
Chico, CA 95973

Prepared By:

KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, California 95650
(916) 660-1555

October 12, 2018

4399-01

TRAFFIC IMPACT ANALYSIS FOR
ORLAND COMMERCE LANE PLAZA
Orland, CA

TABLE OF CONTENTS

KDA

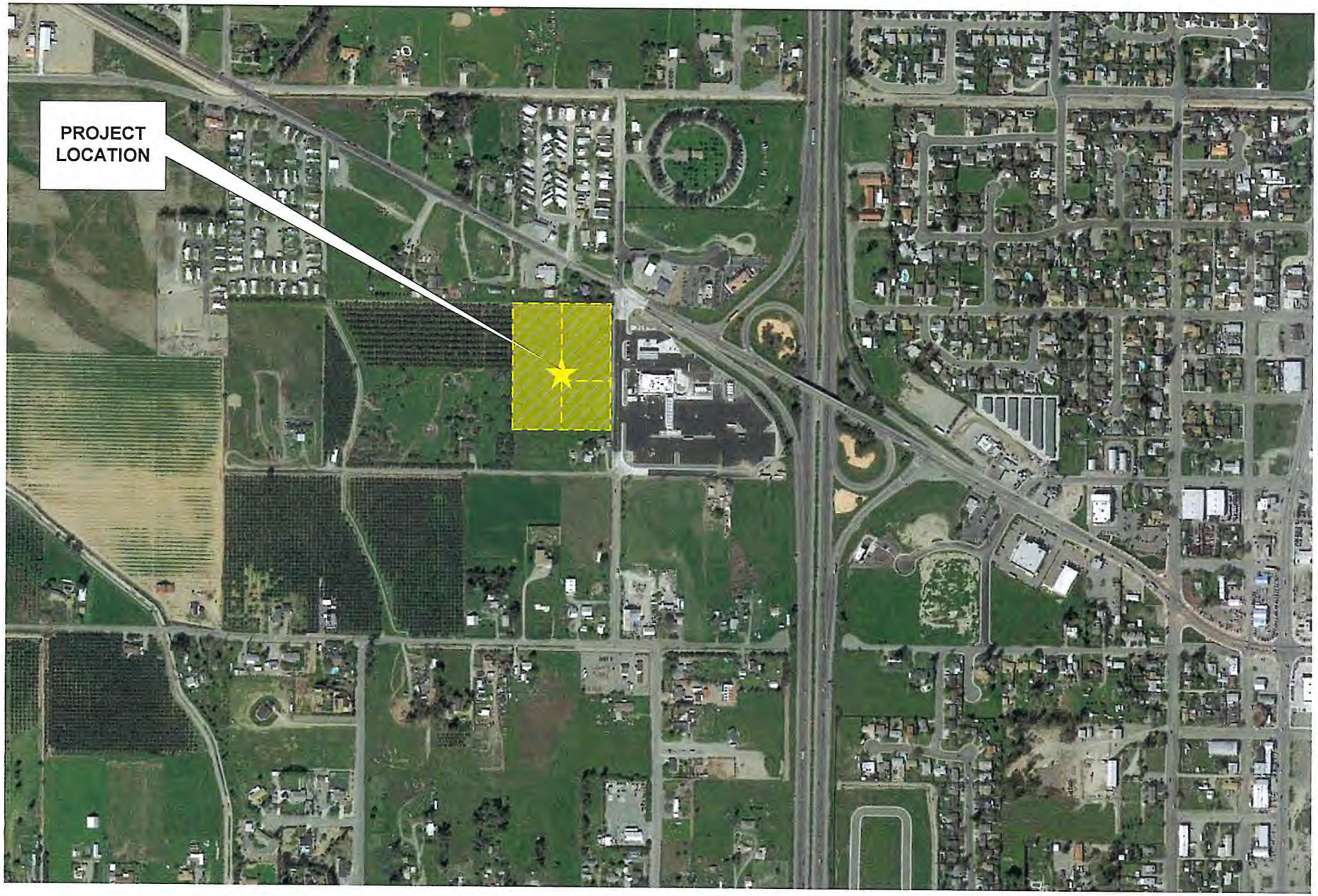
TRAFFIC IMPACT ANALYSIS FOR
ORLAND COMMERCE LANE PLAZA
Orland, CA

INTRODUCTION

This report summarizes KD Anderson & Associates analysis of the potential traffic impacts associated with development of the Commerce Lane Plaza retail properties involved in rezoning 5½ acres in the area west of the County Road 13 / Commerce Lane (County Road HH) intersection in western Orland. The project site is located south of Newville Road and west of Interstate 5 near the Flying J Travel Stop as noted in Figure 1.

The proposed project would create an area zoned for highway commercial. Roughly three acres will be occupied by two commercial parcels. An adjoining estimated 2½ acre parcel is designated for future highway commercial uses. Access to the site is proposed via driveways on Commerce Lane (County Road HH) and potential reciprocal access to County Road 13 via the approved hotel to the south.

The purpose of this analysis is to identify the potential traffic-related impacts of the project within the context of current traffic conditions and to evaluate the cumulative impacts of the annexation within the context of future traffic conditions in the Orland area. This analysis includes evaluation of existing circulation conditions in the area based upon current weekday a.m. and p.m. peak hour traffic volumes. The extent to which improvements may already be needed to meet minimum standards has been determined. The characteristics of the proposed project have been determined based on probable peak hour and daily trip generation, regional trip distribution and local trip assignment. Forecasts of future year traffic conditions, including other development anticipated under the Orland General Plan have been analyzed with and without the proposed Re-Zone. Mitigation measures needed to ensure satisfactory operation of area intersections under each development scenario have been identified, and the project's fair share contribution at each location has been calculated.



VICINITY MAP

KD Anderson & Associates, Inc.
Transportation Engineers

6840-01 RA 10/12/2018

figure 1

EXISTING SETTING

Existing Street and Highway System

The proposed project will be served by several major roadways. Regional access is provided by Interstate 5 and State Route 32, which link the site with the other Northern California communities to the north and south and with the City of Orland to the east. Local access to the project site is provided via Newville Road and County Road HH. The following is a description of these facilities, as well as other roadways in the area of the project site.

Interstate 5 (I-5) is a north-south four-lane freeway that adjoins western Orland. Interstate 5 is the primary route through California and begins at the US-Mexico border in southern California and extends northerly to the California-Oregon border. Access to Interstate 5 is controlled and in the area of the project interchanges at South Street (County Road 16) and at SR 32-Newville Road are available. The most recent traffic volume counts published by Caltrans indicate that I-5 carried an *Annual Average Daily Traffic (AADT)* volume of 28,000 to 27,000 vehicles per day through the City of Orland. Trucks comprise 29% of the daily volume south of SR 32 and 25% north of SR 32 according to Caltrans data.

State Route 32 is an east-west route that connects with I-5 in Orland and SR 99 in Chico. The portion of SR 32 in the City of Orland located in the vicinity of I-5 is also known as Newville Road. In the area immediately east of the I-5 interchange Newville Road (SR 32) is a two lane/four lane arterial with left-turn lanes at intersections. The speed limit on SR 32 is 35 miles per hour (mph) east of I-5. According to the Caltrans website, the segment of Newville Road (SR 32) east of the interchange carried 8,500 AADT in 2016, with the volume rising to 10,800 AADT in the area east of the 6th Avenue intersection. The State Route 32 Transportation Concept Report identifies the current daily traffic volume east of I-5 at 9,752, which is more in line with recent peak hour counts. Trucks comprise 12% of the daily traffic on SR 32 through Orland according to Caltrans data.

The **Interstate 5 / SR 32 (Newville Road) interchange** is a partial cloverleaf layout. Northbound and southbound off-ramps terminate at stop sign controlled intersections on Newville Road. Separate on-ramps to I-5 are provided in both directions which eliminates left turning traffic across mainline Newville Road. Caltrans recently approved an all-way stop for the northbound ramp intersection. SR 32 has a two-lane crossing over I-5. Caltrans publishes daily traffic volume information for freeway ramps. The most recent data from 2014 is summarized in Table 1. (Note: these counts were made before the Flying J opened).

Newville Road west of I-5 is a Glenn County road that extends for roughly 7 miles to the Tehama County line near Black Butte Lake. This portion of Newville Road is designated a Minor Arterial in the Glenn County General Plan Circulation Element and an Arterial in the City of Orland General Plan Circulation Element. Newville Road is a two-lane rural road west of I-5 with a posted speed limit of 35 mph. The most recent traffic volume counts made of the Orland GPU EIR in 2009 indicated that Newville Road carried 5,108 vehicles per day west of County Road HH, however this count was made before the Flying J opened.

TABLE 1 DAILY INTERSTATE 5 RAMP VOLUMES		
Direction	**Location**	**Daily Volume (2014)**
Southbound	Off-ramp to Newville Road (SR 32)	1,150
	On-ramp from westbound Newville Road	1,200
	On-ramp from eastbound Newville Road	580
Northbound	Off-ramp to Newville Road (SR 32)	1,600
	On-ramp from eastbound Newville Road (SR 32)	330
	On-ramp from westbound Newville Road (SR 32)	460

County Road HH (Commerce Road) is a north-south street that runs southerly from an intersection on County Road 12 across Newville Road to its southern terminus on County Road 15 (Newport Road). County Road HH provides access to existing highway commercial, light industrial and residential uses west of I-5. County Road HH is designated a Minor Collector in the Orland Circulation Element. The Orland General Plan Circulation Element indicates that County Road HH will be extended south to County Road 16 in the future. Today the portion of County Road HH near the project is called Commerce Road and was widened with the Flying J project. The rural prima facie speed limit of 55 mph is in effect on County Road HH south of Newville Road. The Orland General Plan EIR identifies the daily traffic volume on County Road HH was 945 vehicles per day in the area south of Newville Road before the Flying J opened.

The **Newville Road / Commerce Lane (County Road HH) intersection** is controlled by an all-way stop. Improvements were made with the Flying J, and there are separate left turn lanes on the Newville Road approaches and a separate right turn lane on the northbound County Road HH approach.

County Road 13 is a-two lane local street that connects County Road HH with rural residential areas west of I-5. County Road 13 extends east from the County Road HH intersection along the Pilot Flying J Site to a turn-around near the I-5 right of way. No daily traffic volume counts are available for County Road 13.

The **County Road HH / County Road 13 intersection** is controlled by an all-way stop. There is a separate southbound left turn lane on County Road HH at this intersection.

Alternative Transportation Modes

Sidewalks. Concrete and asphalt sidewalks exist at various locations along most City of Orland streets but become less prevalent on Glenn County roads adjoining the community. As noted in Table 2, there are few sidewalks in the area west of I-5 although there is existing sidewalk on the north side of Newville Road (SR 32) across I-5.

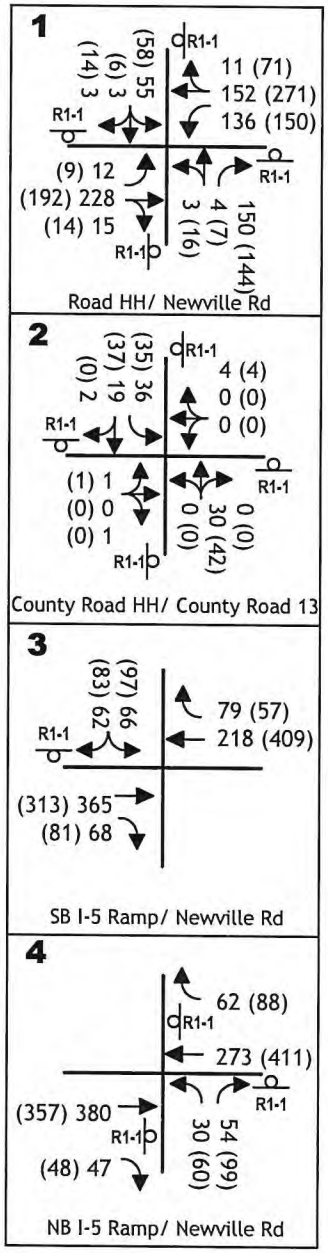
TABLE 2 SIDEWALK INVENTORY				
Street	**From**	**To**	**Side**	**Sidewalk**
Newville Road	County Road HH	Southbound I-5 ramps	North	Partial
			South	No
	Southbound I-5 ramps	Northbound I-5 ramps	North	Yes
			South	No
	Northbound I-5 ramps	9th Street – Tehama Street	North	Yes
			South	Partial
	9th Street – Tehama Street	8th Street	North	Yes
			South	Yes
County Road HH	Newville Road	County Road 13	East	Yes
			West	No
	County Road 13	County Road 14	East	No
			West	No

Bicycle Facilities. Presently there are no formally designated bicycle lanes or bicycle facilities in the City of Orland. However, the City understands the need to move people through the community. The City is planning multi-use pathways along Stony Creek, as well as multi-use pathways within the right-of-ways of undergrounded canals. Additionally, street widths can accommodate bicycle traffic in some areas, and bicycle racks are available at schools and parks.

Public Transit. Public transportation bus service is provided to the City of Orland through Glenn Ride, which is a transit service provided by Glenn County. It is a fixed-route bus system with seven round trips every weekday and three round trips on Saturday from Willows to Chico. There are currently 14 bus stops in Orland. The stop closest to the proposed project is at the 9th Street / Newville Road intersection (i.e., CVS Pharmacy & Burger King).

Existing Peak Hour Traffic Volumes

To quantify existing traffic conditions, peak hour intersection turning movement count data were collected for this analysis at the four existing study intersections. The count data was collected during the 7:00 a.m. to 9:00 a.m. morning peak period and the 4:00 p.m. to 6:00 p.m. evening peak period when the Flying J was in normal operation. New traffic counts were conducted at the I-5 ramps on November 29, 2016 for the City of Orland, and this data was used to adjust counts made at the Newville Road / County Road HH intersection in June 2016 to November levels. Existing peak hour traffic volume data, as well as current intersection traffic controls and intersection lane geometry, are presented in Figure 2.



KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

figure 2

Level of Service Definition and Calculation

To quantitatively evaluate traffic conditions, and to provide a basis for comparison of operating conditions with and without traffic generated by the proposed project, Levels of Service (LOS) were determined at study area intersections and at freeway ramp terminals.

Level of Service is a quantitative measure of traffic operating conditions using letter grades "A" through "F" to characterize operating conditions at an intersection, on highways and at freeway ramp terminals. LOS A through F represents progressively worsening traffic conditions. The characteristics associated with the various Levels of Service for intersections and freeway merge-diverge areas are presented in Table 3.

TABLE 3
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Freeway Ramp Terminal
A	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Density < 10.0 pc/ln/mi
B	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and≤ 15 sec/veh	Density > 10 and < 20 pc/ln/mi
C	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and≤ 25 sec/veh	Density >20 and < 28 pc/ln/mi
D	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and≤ 35 sec/veh	Density >28 and < 35 pc/ln/mi
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and≤ 50 sec/veh	Density > 35 pc/ln/mi
F	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Demand Exceeds Capacity

Source: Transportation Research Board 2010.

Levels of service were calculated for this study using the methodology contained in the *2010 Highway Capacity Manual* (Transportation Research Board 2012). At signalized intersections and intersections controlled by four-way stop signs, the overall Level of Service for intersections

is based on the average length of delays for all motorists at the intersection. At two-way stop-sign-controlled unsignalized intersections (or one-way stop T intersections), the Level of Service is based on the length of the average delay experienced by motorists on the worst single movement, which is typically a left turn made from the stop-sign-controlled approach to the intersection. It should be noted that overall intersection average Level of Service at un-signalized intersections is better, often much better, than the Level of Service for the worst single movement.

Level of Service calculations for intersections specifically account for the presence of large trucks whose acceleration and deceleration characteristics differ from passenger vehicles. Both calculations include truck percentage as an input and reduce the theoretical facility capacity accordingly to account for the presence of large vehicles. As noted later in this report, current truck percentages were identified in the new traffic counts and adjusted under each scenario as needed to reflect future conditions.

Level of Service Based on Roadway Segment Volume

The Orland General Plan EIR addressed Level of Service at a planning level on roadway segments based on daily traffic volume. The roadway segment Level of Service criteria identifies maximum daily traffic volume thresholds for each Level of Service grade. Thresholds are identified based on facility classification (i.e., arterials, major collectors, minor collectors, and local roadways) and the number of through travel lanes. The thresholds presented in the City of Orland General Plan EIR are shown in Table 4.

Traffic volumes vary substantially during a 24-hour period and at locations within roadway segments. As a result, Level of Service based on roadway segments daily volume is an inherently generalized analysis approach that is intended to approximate conditions at the most congested locations during the peak period of the day.

TABLE 4
LEVEL OF SERVICE THRESHOLDS FOR ROADWAY SEGMENTS
BASED ON DAILY TRAFFIC VOLUME

Classification	Lanes	Maximum Daily Volume at LOS				
		A	B	C	D	E
Arterial	4	18,000	21,000	24,000	27,000	30,000
	2	9,000	10,500	12,000	13,500	15,000
	2+	13,500	15,750	18,000	20,250	22,500
Major Collector	2	7,620	8,890	10,160	11,430	12,700
Minor Collector	2	4,800	5,600	6,400	7,200	8,000
Local	2	2,700	3,150	3,600	4,050	4,500

2+ indicates capacity created on Newville Road by second eastbound lane dropping onto SB SR 32 per Flying J DEIR

Level of Service Standards

Minimum Level of Service standards are adopted by local agencies and Caltrans for their respective facilities and presented in various documents.

Caltrans is responsible for maintaining and operating I-5 and SR 32. In accordance with guidance from Caltrans District 3, methods described in the *Guide for the Preparation of Traffic Impact Studies* (California Department of Transportation 2002) were used in this analysis. This document notes that:

> "Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' (see Appendix 'C-3') on State highway facilities . . ."

Therefore, for this analysis, LOS C and better are considered acceptable, and LOS D and worse is considered unacceptable at intersections along the SR 32. The *Guide for the Preparation of Traffic Impact Studies* specifies application of these criteria to signalized intersections. The document does not specify a minimum acceptable LOS for un-signalized intersections. However, for this analysis, these criteria are also applied to un-signalized intersections.

The City of Orland General Plan Circulation Element identified the minimum standard adopted by the City.

> "**Policy 3.3.A:** Construct street and highway improvements to maintain an overall daily roadway Level of Service of "C" with an a.m. and p.m. peak hour roadway and intersection Level of Service of "D" or better, unless other public health, safety, or welfare factors determine otherwise."

Traffic Signal Warrants Procedures

Traffic signal warrants are a series of standards which provide guidelines for determining if a traffic signal is appropriate. Signal warrant analyses are typically conducted at intersections of uncontrolled major streets and stop sign-controlled minor streets. If one or more signal warrants are met, signalization of the intersection may be appropriate. However, a signal should not be installed if none of the warrants are met, since the installation of signals would increase delays on the previously-uncontrolled major street, resulting in an undesirable increase in overall vehicle delay at the intersection. Signalization may also increase the occurrence of particular types of accidents. Therefore, if signals are installed where signal warrants are not met, the detriment of increased accidents and overall delay may be greater than the benefit in traffic operating conditions on the single worst movement at the intersection. Signal warrants, then, provide an industry-standard basis for identifying when the adverse effect on the worst movement is substantial enough to warrant signalization.

The City of Orland conducted a complete traffic signal warrant analysis for the I-5 / SR 32 ramp intersections based on November 2016 data. That assessment determined that traffic signals were not immediately justified.

For this traffic impact study, available data are limited to a.m. and p.m. peak hour volumes. Thus, un-signalized intersections were evaluated using the Peak Hour Warrant (Warrant Number 3) from the California Department of Transportation document *Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California)* (MUTCD) (California Department of Transportation 2012). Urban analysis criteria were employed based on the speed limit on Newville Road – SR 32 (i.e., 35 mph).

Current Peak Hour Traffic Conditions

Intersections. Current a.m. and p.m. peak hour LOS were calculated at existing study intersections under Existing conditions. The results of this analysis are presented in Table 5. The LOS calculation worksheets for Existing conditions are presented in the Appendix.

As shown in Table 5, all of the study intersections currently operate with peak hour Level of Service that meets the City's minimum LOS D standard but also meet the Caltrans LOS C goal. No improvements at these intersections are needed.

Current traffic volumes at un-signalized study intersections were compared to peak hour traffic signal warrant thresholds, and no location carries volumes that satisfy peak hour warrants.

TABLE 5
EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour		Warrants Met?
		Ave Delay (Sec/Veh)	LOS	Ave Delay (Sec/Veh)	LOS	
Newville Road / County Road HH	All-Way Stop	12	B	13	B	No
Newville Road (SR 32) / SB I-5 ramps SB approach	SB Stop	15	B	21	C	No
Newville Road (SR 32) / NB I-5 ramps	All-Way Stop	12	B	15	B	No
County Road HH /Road 13	All-Way Stop	8	A	8	A	No

LOS = Level of Service

PROJECT CHARACTERISTICS

Project Description

Land Use. The proposed project involves rezoning 5½ acres to accommodate speculative highway commercial uses.

Access. Access is assumed along Commerce Lane at the property lines that divide the parcels. Reciprocal access is also assumed through the parcel to County Road HH to the south.

Trip Generation

The number of vehicle trips that are expected to be generated by development of the project has been estimated based on trip generation rates that are applicable to the nature and size of project land uses. Specific trip generation rates published by the Institute of Transportation Engineers (ITE) were used when available for known uses. Where a range of uses is possible, composite trip generation rates were created based on the typical mix of uses that is possible.

Composite Highway Commercial Uses. A set of composite trip generation rates was created for the Highway Commercial zoning based on a mix of gasoline station, restaurants, motel and specialty retail uses that might typically be expected in small centers near freeways. The resulting "per acre" trip generation rates are noted in Table 6.

Forecasts. Table 7 notes the overall trip generation estimate. As shown, under these assumptions the uses in the project could generate 5,136 daily trips, with 383 trips in the a.m. peak hour and 404 trips in the p.m. peak hour.

TABLE 6
TYPICAL HIGHWAY COMMERCIAL TRIP GENERATION CHARACTERISTICS

Land Use	Unit	Prototypical		Trips per Unit						
					AM Peak Hour			PM Peak Hour		
		Quantity	Acres	Daily	In	Out	Total	In	Out	Total
Gasoline with C-Store	fueling position			152.84	51%	49%	11.84	51%	49%	13.86
		12	1.0	1,834	72	70	142	85	81	166
Internal	25%			458	18	18	36	21	21	42
External	75%			1,376	54	52	106	64	60	124
Pass-by	50%			688	27	26	53	32	30	62
Net New External Trips	50%			688	27	26	53	32	30	62
Fast Food Restaurant	ksf	1		496.12	51%	49%	45.42	52%	48%	32.65
		3.5	1.0	1,736	81	78	159	59	55	114
Internal	25%			434	20	20	40	15	14	29
External	75%			1,302	61	58	119	44	41	85
Pass-by	62%-56%			729	38	36	74	25	23	48
Net New External Trips				573	23	22	45	19	18	37
Sit Down Restaurant	ksf	5.0		127.15	55%	45%	10.81	60%	40%	9.85
		5.0	1.0	636	30	24	54	30	19	49
Internal	25%			159	8	6	14	8	4	12
External	75%			477	22	18	40	22	15	37
Pass-by	43%			205	9	8	17	9	7	16
Net New External Trips				272	13	10	23	13	8	21
Hotel	rooms	1		8.17	59%	41%	0.53	51%	49%	0.60
		80	1.5	653	25	17	42	24	24	48
Internal	25%			163	6	5	11	6	6	12
Net New External Trips	75%			490	19	12	31	18	18	36

TABLE 6 (cont'd)
TYPICAL HIGHWAY COMMERCIAL TRIP GENERATION CHARACTERISTICS

Land Use	Unit	Prototypical		Trips per Unit						
					AM Peak Hour			PM Peak Hour		
		Quantity	Acres	Daily	In	Out	Total	In	Out	Total
Retail - Shopping Center	ksf	1		42.70	62%	38%	0.96	48%	52%	3.71
		16.0	1.5	683	10	6	16	28	31	59
Internal	25%			171	3	1	4	7	8	15
External	75%			512	7	5	12	21	23	44
Pass-by	34%			174	0	0	0	7	8	15
Net New External Trips				338	7	5	12	14	15	29
Total Gross Trips	Total		6	5,542	217	196	413	226	210	436
			acre	923.67	53%	47%	68.83	52%	48%	72.67
	Internal			1,385	54	49	103	57	53	110
	External			4,155	163	147	310	169	157	326
			acre	692.50	53%	47%	51.66	51%	49%	54.33
Pass-by Trips				1,796			192			188
Total Net New Trips			6	2,359			221			251
				393.17	54%	46%	24.56	51%	49%	41.83

TABLE 7
PROJECT TRIP GENERATION ESTIMATES

Area	ITE Code		Unit	Quantity	Trips Generated						
					Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
		Highway Commercial Rate	acre	1	923.67	53%	47%	68.83	52%	48%	72.67
4		Highway Commercial		5.56	**5,136**	**203**	**180**	**383**	**210**	**194**	**404**

Trip Distribution. The geographic distribution of project-related trips used in this analysis is based on consideration of the nature of the proposed uses and distribution patterns assumed in the Orland General Plan Update EIR traffic study and Flying J DEIR traffic study.

There are two key factors to be considered. Based on its location, many of the trips associated with the highway commercial uses will be drawn from the stream of traffic passing the site on I-5 or SR 32. Automobile trips would be expected to be drawn from existing traffic on state highways, but a share of the project's automobile traffic may originate in Orland. Truck traffic is expected to be drawn primarily from vehicles that are already part of the 25% of current daily traffic on I-5. Automobile and truck trips could also be drawn from the traffic already visiting the Flying J.

Under normal conditions the trips associated with retail uses are divided between "primary", "diverted linked", "pass-by" and "internal" trips. Primary or "new" trips represent those trips specifically made for the purpose of visiting the site. These trips would affect the project access as well as the local and regional circulation system. Pass-by trips are those made as part of another trip by patrons who simply turn into the project. Pass-by trips would not affect the regional circulation system. Link diverted trips are those that already occur on part of the regional circulation system but may use local streets to reach the project. In this case, trips drawn from existing traffic on I-5 to the project are diverted linked trips. "Internal" trips are those made between complimentary uses in the same area that do not actually use the circulation system.

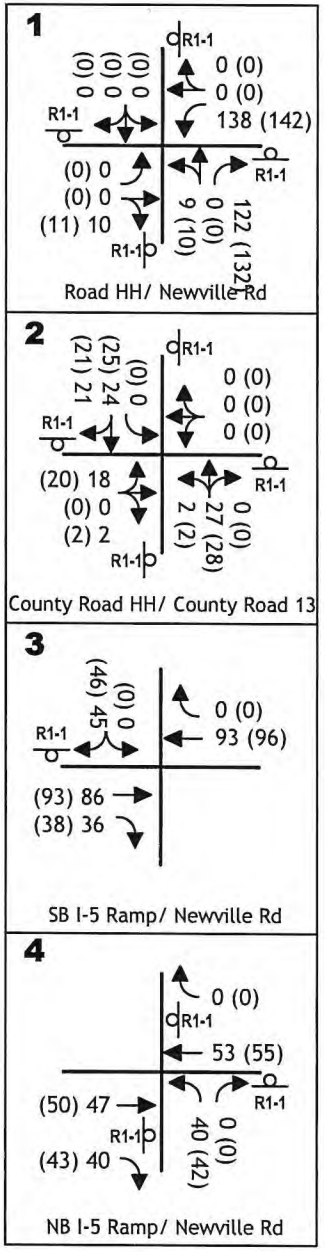
Because the volume of through traffic on Newville Road and County Road HH is low, it has been assumed that the project's trips drawn from traffic on I-5 are diverted-linked trips that would be "new" to the local street system. Trips made by Flying J customers or trips made between complimentary on-site uses on the site would be "internal". The project would create few new "primary" trips on I-5.

Table 8 presents the assumptions made regarding the directional distribution of project trips.

TABLE 8
PROJECT TRIP DISTRIBUTION

Direction	Route	Percentage
North	Interstate 5	22%
South	Interstate 5	16%
	County Road HH	6%
East	Newville Road (SR 32) beyond 8th Street	26%
West	Newville Road	5%
Internal	(Flying J)	25%
Total		**100%**

Trip Assignment. The trips generated by the proposed project were assigned to the study area street system based on the location of site access and the regional distribution patterns noted previously. Figure 3 presents the resulting project trip assignment.



KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

PROJECT ONLY TRAFFIC VOLUMES AND LANE CONFIGURATIONS

figure 3

PROJECT IMPACTS

Traffic Operations Analysis

Traffic volumes associated with the project were estimated by superimposing project trips onto current background traffic. Figure 4 presents Existing Plus Project a.m. and p.m. peak hour traffic volumes at study locations.

Peak Hour Intersection Level of Service. Resulting Existing Plus Project peak hour LOS are presented in Table 9. The LOS calculation worksheets for Existing Plus Project conditions are presented in the Appendix.

As shown, the addition of project generated traffic results in slightly longer delays at the study intersections on Newville Road and SR 32. As indicated in Table 9, the Level of service at the I-5 Southbound Ramp intersection will exceed the City's LOS D minimum standard during the p.m. peak hour with the project. However, at all other locations the average delays are indicative of conditions that satisfy the City's LOS D minimum standard.

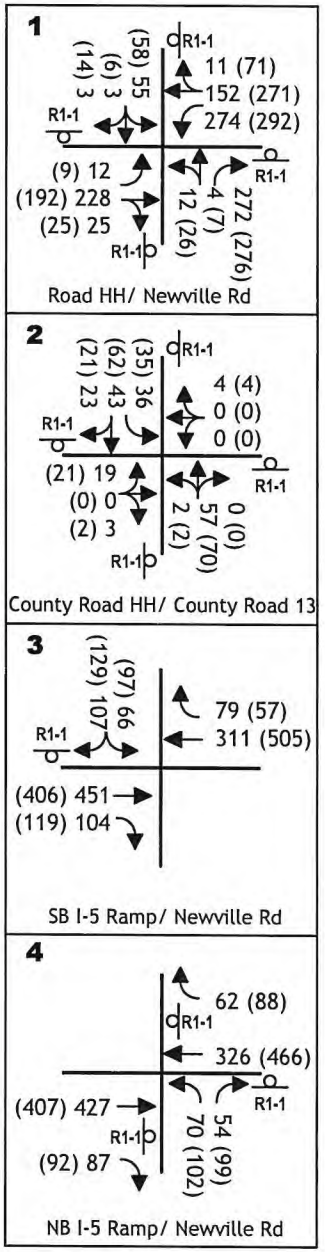
Traffic Signal Warrants. Projected traffic volumes at all locations with the project remain below the level that would satisfy traffic signals.

Traffic Safety Impacts

The adequacy of the study area circulation system has been evaluated with regards to the need for left turn lane channelization on Commerce Lane (County Road HH) at the new site access.

Left Turn Channelization. The project will result in automobile turning into and out of the site via access on Commerce Lane (County Road HH) and via County Road 13. The City of Orland required that the recently constructed Flying J respond to that activity on County Road HH by widening the road to provide a separate southbound left turn lane at the County Road 13 intersection. Ultimately County Road HH will be widened in the area north of County Road 13 when adjoining property is developed to create a continuous Two-Way Left-Turn lane.

Development of the project will create similar turning movements but arguably many fewer trucks than Flying J. Thus, projected traffic volumes do not create the immediate need for a separate northbound left turn lane at the truck wash access, but the project's frontage improvements should be positioned so as to accommodate a continuous southbound left turn lane when west side improvements occur in the future.



KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

EXISTING PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

figure 4

TABLE 9
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION LEVELS OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour			
		Existing		EX plus Project		Existing		EX Plus Project	
		Ave Delay (Sec/Veh)	LOS	Ave Delay (sec/veh)	LOS	Ave Delay (Sec/Veh)	LOS	Ave Delay (sec/veh)	LOS
Newville Road / County Road HH	All-Way Stop	12.1	B	17.7	C	13	B	19.4	C
Newville Road (SR 32) / SB I-5 ramps SB approach	SB Stop	14.6	C	19	C	21	C	**35.5**	**E**
Newville Road (SR 32) / NB I-5 ramps	All-Way Stop	12.1	B	14.9	B	15	B	19.7	C
County Road HH /Road 13	All-Way Stop	8.3	A	8.4	A	8	A	8.4	A

LOS = Level of Service
BOLD = values exceed Level of Service D
Highlighted Values are significant impact

Driveway Location

The adequacy of the new project driveways will ultimately be predicated on the absence of conflicts with Flying J traffic and the volume of through traffic on Commerce Lane. If the new driveways are generally located near the property lines that separate parcels as they are proposed then a southern driveway just north of the approved hotel restaurant site would be roughly opposite the truck exit for Flying J. Nearly all of the traffic leaving Flying J at that location turns right. Few if any southbound left turns would occur at this location. Inbound truck traffic does occur at the Co Road 13 intersection, but as very few northbound left turns into the project site are anticipated, conflicts between the project trips and Flying J traffic would be minimal. The existing centerline striping on Commerce Lane in this area prohibits left turns for about 240 feet north of the County Road 13 intersection (i.e., double-double yellow). This should be modified when the project proceeds to allow legal left turns.

The more northerly property line is about 215 feet closer to Newville Road and is south of the center of the Flying J Center's southern automobile driveway. The new driveway should be planned to align with the Flying J Center's driveway.

Impacts to Alternative Transportation Modes

The project may result in pedestrians and bicyclists who would travel between the site and the balance of the Orland area east of I-5. The number of pedestrians is not likely to be appreciable, and the safe path of travel to Orland that was created with the Flying J project remains adequate with the proposed project. Development on the project should, however, be accompanied by sidewalks along the frontage and a crosswalk across Commerce Lane to the Flying J site should be included.

CUMULATIVE CONDITIONS ANALYSIS

This report section describes the cumulative impacts of the proposed project within the context of two cumulative conditions. The first condition assumes occupancy of other another approved project in this area. The second longer term cumulative condition is based on the Orland General Plan EIR. The text which follows describes the approach used to forecast future "Cumulative" traffic volumes under "No Project" and "Plus Project" conditions.

Methodology / Assumptions – Existing Plus Approved Project

The City of Orland considered and approved an application for a development on 3 acre portion of the property across County Road HH from the Flying J. That project, which involved an 80 room hotel and a 6,000 sf high turnover sit down restaurant with access to both County Road HH and County Road 13, was the subject of a traffic analysis conducted in 2016[1].

This project was forecast to generate 107 trips in the a.m. peak hour and 107 trips in the p.m. peak hour. These trips would be assigned to the local street system based on trip distribution assumptions that were similar to those identified for the proposed Truck Wash / Commercial project.

Methodology/Assumptions – Long Term

The Orland General Plan Update EIR traffic study included creation of a local traffic assignment model to address the overall effect of community development as well as through traffic increases on state highways. For this analysis this tool was reviewed to identify assumptions regarding regional through traffic and development on the subject site.

Land Use. The General Plan EIR traffic model assumed development would occur at various locations throughout Orland over the life of the General Plan. The following list summarizes land use development assumed in that study:

- 1,209 single family dwelling units,
- 192 multiple family dwelling units,
- 290,610 building square feet of retail commercial uses,
- 8.90 acres of office land use,
- 61.97 acres of light industrial / commercial use, and
- 23.31 acres of heavy industrial use.

The GPU EIR traffic study made assumptions regarding development in the area west of I-5. A total of 8.3 acres of commercial development was assumed in the area south of Newville Road and north of County Road 14. This development was assumed to be in the general area of the Flying J site.

---

[1] Traffic Impact Assessment For Hotel / Restaurant Near Flying J Truck Stop In Orland, CA, KDA, August 8, 2016.

As noted above, the City of Orland considered and approved an application for development on a 3 acre portion of the property with an 80 room hotel and a 6,000 sf high turnover sit down restaurant with access to both County Road HH and County Road 13. Together this project and the Flying J would occupy acreage that was similar to but larger than the allocation made in the General Plan EIR.

For this analysis two land use scenarios have been evaluated:

1. No development on project site but development per the General Plan EIR elsewhere in Orland, including the hotel and restaurant on County Road HH.
2. Same as #1 with the proposed project.

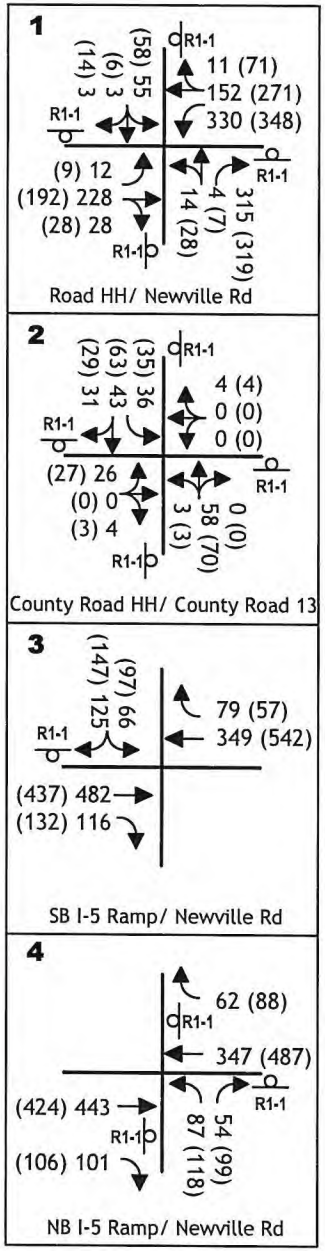
Existing Plus Approved Projects (EPAP) Traffic Impacts

Traffic Volumes. Figure 5 illustrates short term future peak hour traffic volumes assuming that the proposed Truck Wash / Commercial project proceeds and the hotel / restaurant project is occupied.

Intersection Level of Service. Table 10 presents the Levels of Service projected at study intersections if both the proposed and approved projects proceed. As shown the minimum LOS D standard will continue to be exceeded at the Newville Road / I-5 Southbound Ramp intersection, but all other locations will still satisfy the minimum standard.

Traffic Signal Warrants. The volume of traffic forecast at study intersections under EPAP Plus Project conditions was compared to MUTCD peak hour warrant requirements to see whether traffic signals will be justified. As indicated in Table 11, signal warrants are satisfied at the Newville Road / County Road HH intersection and at the southbound I-5 ramp intersection during the pm peak hour. Neither the northbound I-5 ramp intersection nor the intersections on County Road HH south of Newville Road carry volumes that satisfy peak hour warrants.

As noted previously in the discussion of intersection Levels of Service, funding for these traffic signals has been identified in the City traffic impact mitigation fee program.



EXISTING PLUS PROJECT AND HOTEL-RESTAURANT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

figure 5

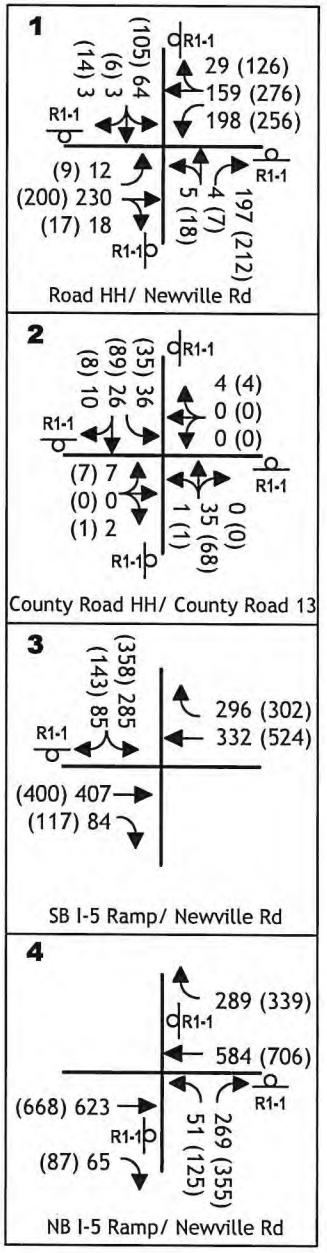
TABLE 10 EXISTING PLUS APPROVED PROJECT (EPAP) PEAK HOUR INTERSECTION LEVELS OF SERVICE					
		AM Peak Hour		PM Peak Hour	
		Existing Plus Project and Hotel-Restaurant		Existing Plus Project and Hotel-Restaurant	
Intersection	Control	Average Delay (Sec/Veh)	LOS	Average Delay (Sec/Veh)	LOS
Newville Rd / County Road HH	All-Way Stop	24.3	C	25.3	D
Newville Rd (SR 32) / SB I-5 ramps SB approach	SB Stop	22.0	C	**47.7**	**E**
Newville Rd (SR 32) / NB I-5 ramps	All-Way Stop	16.9	C	22.7	C
County Rd HH / Road 13	All-Way Stop	8.3	A	8.5	A
LOS = Level of Service **BOLD** = values exceed Level of Service D **Highlighted** Values are significant impact					

TABLE 11 EXISTING PLUS HOTEL-RESTAURANT AND PROJECT TRAFFIC SIGNAL WARRANTS						
	AM Peak Hour			PM Peak Hour		
Location	No Project	With Project	With Project and Hotel / Restaurant	No Project	With Project	With Project and Hotel / Restaurant
Newville Rd / Commerce Lane (County Road HH)	No	No	No	No	No	**Yes**
Newville Rd / SB I-5 ramps	No	No	No	No	No	**Yes**
Newville Rd / NB I-5 ramps	No	No	No	No	No	No
County Road HH / Road 13	No	No	No	No	No	No

Long Term Cumulative Impacts

Traffic Volume Forecasts. Traffic volume forecasts were created for the two cumulative scenarios using the General Plan EIR traffic model. The model was modified to make use of current traffic volumes in the area of the project and to address the presence of Flying J in those new counts. Figure 6 presents the Cumulative No Project conditions at study area intersections, while Figure 7 presents the peak hour volumes under Cumulative Plus Project conditions.

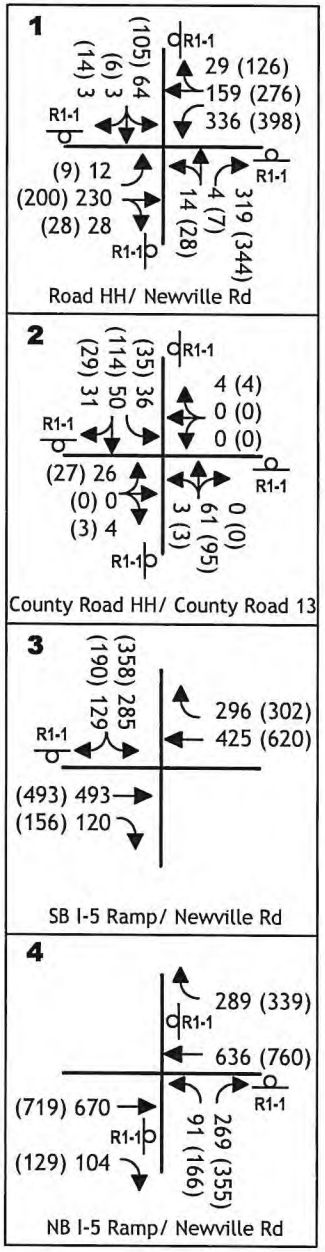
These figures also illustrate assumed intersection geometry. As shown, while the City's traffic impact fee program includes funds for improvements to study intersections, no improvements have been assumed in order to determine the extent of project impacts. Those funded improvements are presented as mitigations.



CUMULATIVE WITH HOTEL-RESTAURANT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

figure 6



CUMULATIVE WITH PROJECT AND HOTEL-RESTAURANT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers
6840-01 RA 10/12/2018

figure 7

Intersection Levels of Service. Projected Levels of Service at study area intersections with and without the project assuming no improvements are made as noted in Table 12. As indicated the two un-signalized intersections on SR 32 at the I-5 ramps intersections are projected to operate with Levels of Service which exceed the City's LOS D standard with and without the proposed project if improvements are not made. The project's trips will exacerbate conditions that are forecast to be deficient, and the project's cumulative impact is significant at these locations.

At the Newville Road / SB I-5 ramps intersection an all-way stop with auxiliary southbound right turn lane would still result in LOS F in the p.m. peak hour. A traffic signal would operate at LOS C with and without the project. A traffic signal at this location is currently included in the City traffic impact mitigation fee program.

Similarly, the Newville Road (SR 32) / NB I-5 ramps intersection would operate at LOS C with a traffic signal. A traffic signal at this location is currently included in the City's traffic impact mitigation fee program.

As indicated, the existing configuration of the Newville Road / Commerce Lane (County Road HH) intersection would exceed the City's LOS D standard in the Cumulative plus Project conditions. A traffic signal would operate at LOS C with and without the project. A traffic signal at this location is currently included in the City traffic impact mitigation fee program.

The Levels of Service occurring at the County Road HH / County Road 13 intersection are projected to be LOS B or better with or without the project which satisfies the City's minimum LOS D standard. No additional improvements are needed beyond the project's frontage improvements on the southeast corner.

TABLE 12
LONG TERM CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION LEVELS OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour			
		Cumulative Plus Hotel-Restaurant		Cumulative Plus Hotel-Restaurant Plus Project		Cumulative Plus Hotel-Restaurant		Cumulative Plus Hotel-Restaurant Plus Project	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
Newville Road / County Road HH	All-Way Stop	13.5	B	26	D	20	C	**42**	**E**
	Signal	32	C	35.5	D	29	C	30.7	C
Newville Road (SR 32) / SB I-5 ramps SB approach	SB Stop	**127.1**	**F**	**314.3**	**F**	**417**	**F**	**725.5**	**F**
	Signal	25	C	27.3	C	27	C	31.7	C
Newville Road (SR 32) / NB I-5 ramps	All-Way Stop	**106.5**	**F**	**143.9**	**F**	**163**	**F**	**201.5**	**F**
	Signal	26	C	27.5	C	26	C	26.4	C
Commerce Lane (County Road HH) / County Road 13	All-Way Stop	8.3	A	8.4	A	9	A	9	A

LOS = Level of Service
BOLD = values exceed Level of Service D
Highlighted Values are significant impact

Traffic Signal Warrants. The volume of traffic forecast at study intersections under Cumulative and Cumulative plus Project conditions was compared to MUTCD peak hour warrant requirements to see whether traffic signals will be justified in the future. As indicated in Table 13, the Newville Road / Commerce Lane (County Road HH) intersection carries volumes that satisfy peak hour warrants with the project during the p.m. peak hour. Signal warrants are satisfied at the two I-5 ramp intersections with and without the project. None of the intersections on County Road HH south of Newville Road carry volumes that satisfy peak hour warrants.

As noted previously in the discussion of intersection Levels of Service, funding for these traffic signals has been identified in the City traffic impact mitigation fee program.

TABLE 13
CUMULATIVE TRAFFIC SIGNAL WARRANTS

Location	AM Peak Hour		PM Peak Hour	
	No Project	With Project	No Project	With Project
Newville Rd / Commerce Lane (County Rd HH)	No	No	No	Yes
Newville Rd / SB I-5 ramps	Yes	Yes	Yes	Yes
Newville Rd (SR 32) / NB I-5 ramps	Yes	Yes	Yes	Yes
County Rd HH / Road 13 intersection	No	No	No	No

Roadway Segment Levels of Service. Table 14 identifies projected daily traffic volumes on study area roads with and without the proposed project and uses that information to determine the planning level LOS for each facility. Because a comprehensive analysis of existing daily traffic volumes was not performed, this analysis makes use of data from the Flying J DEIR traffic study. As noted earlier the City's minimum Level of Service based on daily volume is LOS C.

No Project Conditions. As shown, if the proposed project does not proceed, the long term background traffic volume on SR 32 will exceed the LOS C threshold between the SB I-5 ramps and the NB I-5 ramps. In addition, the daily volume on County Road HH would exceed the LOS C threshold for a 2 lane Minor Collector. Improvements to a Major Collector standard will be needed, and this improvement was acknowledged in the Flying J DEIR.

Cumulative Plus Project Conditions. The addition of trips generated by the project will increase the cumulative traffic volume on study area streets. No streets that were not deficient without the project would now operate with Level of Service that exceeds the LOS C standard.

The volume of traffic on SR 32 over I-5 would be indicative of LOS F, and the project would exacerbate the deficient "No Project" conditions.

Measures to improve the Level of Service on study area roadway segments have been evaluated, however, it is important to note that in urban areas the flow of traffic through major intersections is generally the controlling factor for the quality of traffic flow. Thus, if the intersections can be made to operate with an adequate Level of Service, the intermediate roadway segments typically perform adequately even though the planning level LOS suggests otherwise.

Between the southbound and northbound I-5 ramps the structure over I-5 would theoretically have to be widened to deliver LOS C based on City thresholds. This level of improvement has not been contemplated in the City General Plan or in the SR 32 TCR. Modifications to the SR 32 structure over I-80 are not included in the City's traffic impact mitigation fee program.

On County Road HH development of a two lane Major Collector-Arterial type roadway would provide additional capacity and deliver LOS C under Cumulative Plus Project conditions.

TABLE 14
CUMULATIVE PLUS PROJECT ROADWAY SEGMENT LEVELS OF SERVICE

Street	From	To	Class	Lanes	Cumulative		Cumulative Plus Project		
							Daily Volume		
					Daily Volume	Level of Service	Project Only	Total	Level of Service
Newville Road	Co Rd HH	I-5 SB ramps	Arterial	2+	13,595	B	3,485	17,080	C
SR 32	I-5 SB ramps	I-5 NB ramps		2	**17,030**	**F**	2,410	**19,440**	**F**
County Rd HH / Commerce Lane	Newville Road	County Road 13	Minor Col	2	**6,950**	**D**	3,740	**10,690**	**F**
			Major Col	2				7,400	A
	County Road 13	County Road 15	Minor Col	2	1,320	A	110	1,430	A

Bold values exceed the City of Orland LOS C threshold for daily volume based Level of Service.
Highlighted values are a significant impact.
2+ indicates the addition of a second eastbound lane dropping onto the southbound on-ramp

FINDINGS/ MITIGATION MEASURES / RECOMMENDATIONS

The purpose of this section is to summarize significant project impacts and to describe measures which will reduce those impacts to a less than significant level. Based on City of Orland General Plan policy, "unacceptable" conditions are identified as those which exceed the City of Orland's Level of Service D threshold at intersections during peak hours (i.e., LOS E or F) or exceed the LOS C threshold on roadway segments based on daily volume (i.e., LOS D, E or F).

The feasibility of completing identified improvements has been discussed, and the extent to which funding is available to complete cumulative mitigation measures has been evaluated. The proposed project's fair share of cumulative mitigation measures follows as Table 15. Two alternative approaches to the calculation are presented assuming either the project's trips as a percentage of all traffic, or, alternatively as a percentage of future new traffic. Because Pilot Flying J was also conditioned to pay its fair share, the latter calculation is based on the difference between cumulative volumes and the original "existing" condition before Pilot Flying J was opened.

Current Conditions

Currently the study intersections addressed herein operate with Levels of Service which satisfy the City's LOS D minimum and traffic signal warrants are not satisfied. Therefore, no capacity improvements are needed in this area of Orland at this time.

Existing Plus Project Alone Conditions

Two traffic impacts have been identified for Existing Plus Project conditions.

Impact 1: The Newville Road / Southbound I-5 ramps intersection will operate with Level of Service that exceeds the LOS D standard. However, while this is a significant impact the does not carry volumes that satisfy traffic signal warrants, and as a result the immediate signalization of the intersection is not appropriate. An all-way stop would yield LOS C.

Mitigation 1: Contribute to cost of Traffic Signal. Because the intersection is included in the City's traffic impact fee program, payment of adopted fees will be adequate mitigation. With this mitigation the project's impact is not significant.

Impact 2: Impact to pedestrian safety. Development of the project will result in pedestrians walking between the site and the balance of the City of Orland east of I-5. Because no crossing exists along Commerce lane (County Road HH), pedestrians will be crossing County Road HH at various locations. This is a significant safety impact.

Mitigation 2: Create safe pedestrian crossing. The project proponents shall incorporate a crosswalk into improvements to the County Road HH / County Road 13 intersection and install sidewalks along the project frontage as development proceeds. With this improvement the impact is less than significant.

Existing Plus Project Plus Approved Project (EPAP) Impacts

The same location that was deficient with the project alone exceeds the minimum LOS D standard with the addition of approved project traffic. At that point traffic signal warrants would be satisfied at the Newville Road / Southbound I-5 ramps intersection. Mitigation 1 will also address this impact.

Cumulative Plus Project Impacts

Impact 3: Impact to Level of Service at Newville Road / SB I-5 Ramps intersection. The addition of project generated automobile and truck traffic and cumulative background traffic resulting from other development and through traffic on SR 32 will result in the off-ramp approach to the Newville Road / SB I-5 ramps intersection operating with LOS F conditions. As LOS F exceeds the City's minimum LOS D standard, this is a significant impact.

Mitigation 3: Contribute Fair Share to the cost of widening the off-ramp to provide a separate right turn lane and installing a Traffic Signal. This improvement would result in Level of Service B conditions, which satisfy the City's minimum LOS D standard. Implementation will require work within the Caltrans right of way and an encroachment permit would be required. A traffic signal is identified in the City General Plan EIR and is in the City's traffic impact mitigation fee program. Because this improvement is not required solely as a result of the project, project proponents should contribute their fair share to the cost of this mitigation. With this mitigation, the project's cumulative impact is less than significant.

Impact 4: Impact to Level of Service at Newville Road / NB I-5 ramps intersection. The addition of project generated automobile and truck traffic and cumulative background traffic resulting from other development and through traffic on SR 32 will result in the off ramp operating with LOS F conditions. As LOS F exceeds the City's minimum LOS D standard, this is a significant impact.

Mitigation 4: Contribute Fair Share to the cost of installing a Traffic Signal. This improvement would result in Level of Service C conditions, which satisfy the City's minimum LOS D standard. Implementation will require work within the Caltrans right of way and an encroachment permit would be required. This improvement is identified in the City General Plan EIR and is in the City's traffic impact mitigation fee program. Because this improvement is not required solely as a result of the project, project proponents should contribute their fair share to the cost of this mitigation. With this mitigation, the project's cumulative impact is less than significant.

Impact 5: Impact to Level of Service at Newville Road / County Road HH intersection. The addition of project generated automobile and truck traffic and cumulative background traffic resulting from other development results in LOS E and results in satisfaction of traffic signal warrants at the Newville Road / County Road HH intersection,. This is a significant impact.

Mitigation T-5: Contribute Fair Share to the cost of installing a Traffic Signal. Signalization would result in Level of Service C conditions, which satisfy the City's minimum

LOS D standard and would allow coordinated operation of the other intersections with signals. This improvement is identified in the City General Plan EIR and is in the City's traffic impact mitigation fee program. Because this improvement is not required solely as a result of this project, project proponents should contribute their fair share to the cost of this mitigation. With this mitigation, the project's cumulative impact is less than significant.

Impact T-6: Impact to Level of Service on Newville Road (SR 32) between SB I-5 and NB I-5 ramps based on Daily Traffic Volume. The addition of project generated automobile and truck traffic and cumulative background traffic resulting from other development in Orland will result in total daily traffic volumes on Newville Road that exceed the LOS C standard for a two lane arterial street. This is a significant impact.

Mitigation T-6: Contribute Fair Share to the cost of coordinating Traffic Signals on Newville Road. To deliver LOS C conditions it would be necessary to widen SR 32 to provide additional lanes on the crossing structure. However, this improvement is not included in the General Plan EIR, or the City's traffic impact fee program. Widening the structure is not identified in the SR 32 TCR. Thus, there is no identified funding mechanism for a project of this magnitude and is unreasonable to expect that local development in Orland would be capable of funding this improvement. As noted earlier, short roadway segments can carry high traffic volumes but operate adequately when the intersections have the capacity to handle peak period traffic volumes at a good Level of Service. This is the case with the intersections on SR 32 which are expected to operate at LOS C or better with identified improvements. Coordinating the operation of the study area signals with the operation of the signals further east on SR 32 will be appropriate. Implementation will require work within the Caltrans right of way and an encroachment permit would be required. Because this improvement is not required solely as a result of the project, project proponents should contribute their fair share to the cost of this mitigation.

TABLE 15
FAIR SHARE CALCULATION

	Traffic Volume				Fair Share	
	A	B	C	D		
Location	Existing	Pre Pilot Flying J*	Project Only	Cumulative Plus Project	Percent of all Traffic (C/D)	Percent of New Traffic C/ (D-B)
Based on PM Peak Hour Traffic						
Newville Rd / County Rd HH	952	660	295	1,541	19%	33%
Newville Rd (SR 32) / SB I-5 ramps	1,040	771	273	2,119	13%	20%
Newville Rd (SR 32) / NB I-5 ramps	1,063	857	190	2,468	8%	12%

(b/c) is fair share based on all future traffic
< b/ (c-a) > is fair share as a percentage of "new" future traffic only
(*) source: *Traffic Impact Analysis for Pilot Flying J Travel Center and Annexation, KDA, 1/7/2015*

APPENDICES

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	228	15	136	152	11	3	4	150	55	3	3
Future Vol, veh/h	12	228	15	136	152	11	3	4	150	55	3	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	14	259	17	155	173	13	3	5	170	63	3	3
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	12.7	11.5	10.5	10.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	43%	0%	100%	0%	100%	0%	90%
Vol Thru, %	57%	0%	0%	94%	0%	93%	5%
Vol Right, %	0%	100%	0%	6%	0%	7%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	150	12	243	136	163	61
LT Vol	3	0	12	0	136	0	55
Through Vol	4	0	0	228	0	152	3
RT Vol	0	150	0	15	0	11	3
Lane Flow Rate	8	170	14	276	155	185	69
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.015	0.269	0.024	0.44	0.293	0.29	0.13
Departure Headway (Hd)	6.612	5.686	6.28	5.73	6.834	5.627	6.749
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	541	631	571	630	527	639	531
Service Time	4.352	3.425	4.011	3.461	4.565	3.358	4.797
HCM Lane V/C Ratio	0.015	0.269	0.025	0.438	0.294	0.29	0.13
HCM Control Delay	9.5	10.5	9.2	12.9	12.4	10.7	10.8
HCM Lane LOS	A	B	A	B	B	B	B
HCM 95th-tile Q	0	1.1	0.1	2.2	1.2	1.2	0.4

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	0	0	4	0	30	0	36	19	2
Future Vol, veh/h	1	0	1	0	0	4	0	30	0	36	19	2
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	1	0	1	0	0	5	0	34	0	41	22	2
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7	6.6	7.3	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	50%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	90%
Vol Right, %	0%	50%	100%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	2	4	36	21
LT Vol	0	1	0	36	0
Through Vol	30	0	0	0	19
RT Vol	0	1	4	0	2
Lane Flow Rate	34	2	5	41	24
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.039	0.003	0.005	0.072	0.035
Departure Headway (Hd)	4.092	4.012	3.61	6.304	5.312
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	871	897	997	571	677
Service Time	2.136	2.013	1.611	4.013	3.021
HCM Lane V/C Ratio	0.039	0.002	0.005	0.072	0.035
HCM Control Delay	7.3	7	6.6	9.5	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	365	218	0	66	62
Future Vol, veh/h	0	365	218	0	66	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	415	248	0	75	70

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	663	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	415	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	417	706
Stage 1	0	-	-	0	779	-
Stage 2	0	-	-	0	654	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	417	706
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	654	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	520
HCM Lane V/C Ratio	-	-	0.28
HCM Control Delay (s)	-	-	14.6
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.1

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	0	0	273	30	54
Future Vol, veh/h	380	0	0	273	30	54
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	432	0	0	310	34	61
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	13.3	11.1	9.6
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	54	380	273
LT Vol	30	0	0	0
Through Vol	0	0	380	273
RT Vol	0	54	0	0
Lane Flow Rate	34	61	432	310
Geometry Grp	7	7	2	2
Degree of Util (X)	0.07	0.096	0.554	0.409
Departure Headway (Hd)	7.348	5.613	4.619	4.745
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	485	633	777	754
Service Time	5.133	3.397	2.666	2.797
HCM Lane V/C Ratio	0.07	0.096	0.556	0.411
HCM Control Delay	10.7	9	13.3	11.1
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	0.2	0.3	3.4	2

Intersection	
Intersection Delay, s/veh	47.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	8	68	33	15	279	55	196	44	289	264	27
Future Vol, veh/h	23	8	68	33	15	279	55	196	44	289	264	27
Peak Hour Factor	0.60	0.60	0.60	0.73	0.60	0.73	0.60	0.73	0.73	0.73	0.73	0.60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	13	113	45	25	382	92	268	60	396	362	45
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	17.6	52.2	30.4	59
HCM LOS	C	F	D	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	23%	10%	100%	0%
Vol Thru, %	0%	82%	8%	5%	0%	91%
Vol Right, %	0%	18%	69%	85%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	240	99	327	289	291
LT Vol	55	0	23	33	289	0
Through Vol	0	196	8	15	0	264
RT Vol	0	44	68	279	0	27
Lane Flow Rate	92	329	165	452	396	407
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.232	0.773	0.401	0.929	0.959	0.919
Departure Headway (Hd)	9.12	8.465	8.748	7.389	8.719	8.132
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	394	427	411	493	416	447
Service Time	6.869	6.214	6.808	5.389	6.477	5.89
HCM Lane V/C Ratio	0.234	0.77	0.401	0.917	0.952	0.911
HCM Control Delay	14.6	34.8	17.6	52.2	64.5	53.6
HCM Lane LOS	B	D	C	F	F	F
HCM 95th-tile Q	0.9	6.6	1.9	11	11.1	10.3

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	192	14	150	271	71	16	7	144	58	6	14
Future Vol, veh/h	9	192	14	150	271	71	16	7	144	58	6	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	10	209	15	163	295	77	17	8	157	63	7	15
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	12.4	14.8	10.8	11.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	70%	0%	100%	0%	100%	0%	74%
Vol Thru, %	30%	0%	0%	93%	0%	79%	8%
Vol Right, %	0%	100%	0%	7%	0%	21%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	144	9	206	150	342	78
LT Vol	16	0	9	0	150	0	58
Through Vol	7	0	0	192	0	271	6
RT Vol	0	144	0	14	0	71	14
Lane Flow Rate	25	157	10	224	163	372	85
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.049	0.262	0.018	0.379	0.312	0.576	0.163
Departure Headway (Hd)	7.096	6.032	6.641	6.086	6.886	5.58	6.94
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	504	595	539	591	522	647	515
Service Time	4.848	3.783	4.386	3.83	4.622	3.315	4.999
HCM Lane V/C Ratio	0.05	0.264	0.019	0.379	0.312	0.575	0.165
HCM Control Delay	10.2	10.9	9.5	12.5	12.7	15.7	11.4
HCM Lane LOS	B	B	A	B	B	C	B
HCM 95th-tile Q	0.2	1	0.1	1.8	1.3	3.7	0.6

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	1	0	0	0	0	4	0	42	0	35	37	0
Future Vol, veh/h	1	0	0	0	0	4	0	42	0	35	37	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	1	0	0	0	0	4	0	46	0	38	40	0
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.5	6.7	7.4	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	100%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	1	4	35	37
LT Vol	0	1	0	35	0
Through Vol	42	0	0	0	37
RT Vol	0	0	4	0	0
Lane Flow Rate	46	1	4	38	40
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.052	0.001	0.004	0.067	0.06
Departure Headway (Hd)	4.1	4.473	3.668	6.308	5.382
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	869	805	982	571	669
Service Time	2.145	2.473	1.668	4.014	3.088
HCM Lane V/C Ratio	0.053	0.001	0.004	0.067	0.06
HCM Control Delay	7.4	7.5	6.7	9.5	8.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0	0	0.2	0.2

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	313	409	0	97	83
Future Vol, veh/h	0	313	409	0	97	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	340	445	0	105	90

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	785	445
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	340	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	353	541
Stage 1	0	-	-	0	633	-
Stage 2	0	-	-	0	708	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	353	541
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	708	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	420
HCM Lane V/C Ratio	-	-	0.466
HCM Control Delay (s)	-	-	20.8
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.4

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	357	0	0	411	60	99
Future Vol, veh/h	357	0	0	411	60	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	388	0	0	447	65	108
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	14.4	16.4	10.7
HCM LOS	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	60	99	357	411
LT Vol	60	0	0	0
Through Vol	0	0	357	411
RT Vol	0	99	0	0
Lane Flow Rate	65	108	388	447
Geometry Grp	7	7	2	2
Degree of Util (X)	0.14	0.18	0.556	0.631
Departure Headway (Hd)	7.752	6.011	5.157	5.086
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	463	596	702	715
Service Time	5.491	3.75	3.17	3.097
HCM Lane V/C Ratio	0.14	0.181	0.553	0.625
HCM Control Delay	11.8	10.1	14.4	16.4
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	0.5	0.7	3.4	4.5

Intersection	
Intersection Delay, s/veh	17.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	228	25	274	152	11	12	4	272	55	3	3
Future Vol, veh/h	12	228	25	274	152	11	12	4	272	55	3	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	14	259	28	311	173	13	14	5	309	63	3	3
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	16.9	19.8	16.5	12.5
HCM LOS	C	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	75%	0%	100%	0%	100%	0%	90%
Vol Thru, %	25%	0%	0%	90%	0%	93%	5%
Vol Right, %	0%	100%	0%	10%	0%	7%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	272	12	253	274	163	61
LT Vol	12	0	12	0	274	0	55
Through Vol	4	0	0	228	0	152	3
RT Vol	0	272	0	25	0	11	3
Lane Flow Rate	18	309	14	288	311	185	69
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.038	0.552	0.028	0.54	0.663	0.332	0.154
Departure Headway (Hd)	7.531	6.434	7.34	6.758	7.661	6.444	7.983
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	563	488	535	473	559	449
Service Time	5.249	4.152	5.082	4.499	5.382	4.166	6.036
HCM Lane V/C Ratio	0.038	0.549	0.029	0.538	0.658	0.331	0.154
HCM Control Delay	10.5	16.8	10.3	17.2	24.2	12.3	12.5
HCM Lane LOS	B	C	B	C	C	B	B
HCM 95th-tile Q	0.1	3.3	0.1	3.2	4.8	1.4	0.5

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	0	3	0	0	4	2	57	0	36	43	23
Future Vol, veh/h	19	0	3	0	0	4	2	57	0	36	43	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	22	0	3	0	0	5	2	65	0	41	49	26
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.7	6.9	7.6	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	86%	0%	100%	0%
Vol Thru, %	97%	0%	0%	0%	65%
Vol Right, %	0%	14%	100%	0%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	59	22	4	36	66
LT Vol	2	19	0	36	0
Through Vol	57	0	0	0	43
RT Vol	0	3	4	0	23
Lane Flow Rate	67	25	5	41	75
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.078	0.031	0.005	0.072	0.108
Departure Headway (Hd)	4.176	4.506	3.836	6.361	5.191
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	847	799	938	564	691
Service Time	2.256	2.506	1.837	4.092	2.922
HCM Lane V/C Ratio	0.079	0.031	0.005	0.073	0.109
HCM Control Delay	7.6	7.7	6.9	9.6	8.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.2	0.4

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	451	311	0	66	107
Future Vol, veh/h	0	451	311	0	66	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	513	353	0	75	122

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	866	353
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	513	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	316	613
Stage 1	0	-	-	0	698	-
Stage 2	0	-	-	0	589	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	316	613
Mov Cap-2 Maneuver	-	-	-	-	316	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	589	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	451
HCM Lane V/C Ratio	-	-	0.436
HCM Control Delay (s)	-	-	19
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.2

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	427	0	0	326	70	54
Future Vol, veh/h	427	0	0	326	70	54
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	485	0	0	370	80	61
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	17.1	13.6	10.9
HCM LOS	C	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	54	427	326
LT Vol	70	0	0	0
Through Vol	0	0	427	326
RT Vol	0	54	0	0
Lane Flow Rate	80	61	485	370
Geometry Grp	7	7	2	2
Degree of Util (X)	0.172	0.103	0.659	0.526
Departure Headway (Hd)	7.775	6.034	4.886	5.113
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	463	596	728	711
Service Time	5.49	3.749	2.986	3.113
HCM Lane V/C Ratio	0.173	0.102	0.666	0.52
HCM Control Delay	12.1	9.4	17.1	13.6
HCM Lane LOS	B	A	C	B
HCM 95th-tile Q	0.6	0.3	5	3.1

Intersection	
Intersection Delay, s/veh	24.3
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↱	
Traffic Vol, veh/h	0	406	505	0	97	129
Future Vol, veh/h	0	406	505	0	97	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	441	549	0	105	140
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	20.4	32	14.1
HCM LOS	C	D	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	43%
Vol Thru, %	100%	100%	0%
Vol Right, %	0%	0%	57%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	406	505	226
LT Vol	0	0	97
Through Vol	406	505	0
RT Vol	0	0	129
Lane Flow Rate	441	549	246
Geometry Grp	1	1	1
Degree of Util (X)	0.691	0.848	0.43
Departure Headway (Hd)	5.634	5.564	6.308
Convergence, Y/N	Yes	Yes	Yes
Cap	640	648	567
Service Time	3.696	3.623	4.382
HCM Lane V/C Ratio	0.689	0.847	0.434
HCM Control Delay	20.4	32	14.1
HCM Lane LOS	C	D	B
HCM 95th-tile Q	5.5	9.4	2.1

Intersection	
Intersection Delay, s/veh	19.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	192	25	292	271	71	26	7	276	58	6	14
Future Vol, veh/h	9	192	25	292	271	71	26	7	276	58	6	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	10	209	27	317	295	77	28	8	300	63	7	15
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	15.8	22.8	16.8	12.9
HCM LOS	C	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	79%	0%	100%	0%	100%	0%	74%
Vol Thru, %	21%	0%	0%	88%	0%	79%	8%
Vol Right, %	0%	100%	0%	12%	0%	21%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	33	276	9	217	292	342	78
LT Vol	26	0	9	0	292	0	58
Through Vol	7	0	0	192	0	271	6
RT Vol	0	276	0	25	0	71	14
Lane Flow Rate	36	300	10	236	317	372	85
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.078	0.557	0.021	0.467	0.679	0.66	0.189
Departure Headway (Hd)	7.797	6.679	7.728	7.132	7.705	6.389	8.008
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	461	543	463	505	470	569	449
Service Time	5.516	4.398	5.474	4.878	5.428	4.11	6.056
HCM Lane V/C Ratio	0.078	0.552	0.022	0.467	0.674	0.654	0.189
HCM Control Delay	11.2	17.5	10.6	16	25.3	20.7	12.9
HCM Lane LOS	B	C	B	C	D	C	B
HCM 95th-tile Q	0.3	3.4	0.1	2.4	5	4.8	0.7

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	21	0	2	0	0	4	2	70	0	35	62	21
Future Vol, veh/h	21	0	2	0	0	4	2	70	0	35	62	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	23	0	2	0	0	4	2	76	0	38	67	23
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.8	6.9	7.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	91%	0%	100%	0%
Vol Thru, %	97%	0%	0%	0%	75%
Vol Right, %	0%	9%	100%	0%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	72	23	4	35	83
LT Vol	2	21	0	35	0
Through Vol	70	0	0	0	62
RT Vol	0	2	4	0	21
Lane Flow Rate	78	25	4	38	90
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.091	0.032	0.005	0.067	0.132
Departure Headway (Hd)	4.183	4.602	3.895	6.367	5.264
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	844	783	924	563	681
Service Time	2.272	2.603	1.896	4.102	2.998
HCM Lane V/C Ratio	0.092	0.032	0.004	0.067	0.132
HCM Control Delay	7.7	7.8	6.9	9.6	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.2	0.5

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	406	505	0	97	129
Future Vol, veh/h	0	406	505	0	97	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	441	549	0	105	140

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	990	549
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	441	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	266	469
Stage 1	0	-	-	0	567	-
Stage 2	0	-	-	0	636	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	266	469
Mov Cap-2 Maneuver	-	-	-	-	266	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	35.5
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	353
HCM Lane V/C Ratio	-	-	0.696
HCM Control Delay (s)	-	-	35.5
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	5

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	407	0	0	466	102	99
Future Vol, veh/h	407	0	0	466	102	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	442	0	0	507	111	108
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	19.1	23.4	12.1
HCM LOS	C	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	99	407	466
LT Vol	102	0	0	0
Through Vol	0	0	407	466
RT Vol	0	99	0	0
Lane Flow Rate	111	108	442	507
Geometry Grp	7	7	2	2
Degree of Util (X)	0.25	0.19	0.673	0.758
Departure Headway (Hd)	8.109	6.362	5.474	5.389
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	442	563	659	669
Service Time	5.866	4.118	3.517	3.431
HCM Lane V/C Ratio	0.251	0.192	0.671	0.758
HCM Control Delay	13.6	10.6	19.1	23.4
HCM Lane LOS	B	B	C	C
HCM 95th-tile Q	1	0.7	5.2	7

Intersection	
Intersection Delay, s/veh	24.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	228	28	330	152	11	14	4	315	55	3	3
Future Vol, veh/h	12	228	28	330	152	11	14	4	315	55	3	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	14	259	32	375	173	13	16	5	358	63	3	3
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	19.1	30.6	21.3	13.3
HCM LOS	C	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	78%	0%	100%	0%	100%	0%	90%
Vol Thru, %	22%	0%	0%	89%	0%	93%	5%
Vol Right, %	0%	100%	0%	11%	0%	7%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	315	12	256	330	163	61
LT Vol	14	0	12	0	330	0	55
Through Vol	4	0	0	228	0	152	3
RT Vol	0	315	0	28	0	11	3
Lane Flow Rate	20	358	14	291	375	185	69
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.044	0.666	0.029	0.581	0.83	0.347	0.164
Departure Headway (Hd)	7.815	6.701	7.777	7.185	7.964	6.743	8.519
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	458	541	460	500	454	533	420
Service Time	5.56	4.445	5.53	4.937	5.713	4.492	6.592
HCM Lane V/C Ratio	0.044	0.662	0.03	0.582	0.826	0.347	0.164
HCM Control Delay	10.9	21.9	10.8	19.5	39.2	13.1	13.3
HCM Lane LOS	B	C	B	C	E	B	B
HCM 95th-tile Q	0.1	4.9	0.1	3.6	8	1.5	0.6

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	26	0	4	0	0	4	3	58	0	36	43	31
Future Vol, veh/h	26	0	4	0	0	4	3	58	0	36	43	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	30	0	5	0	0	5	3	66	0	41	49	35
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.7	6.9	7.7	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	87%	0%	100%	0%
Vol Thru, %	95%	0%	0%	0%	58%
Vol Right, %	0%	13%	100%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	30	4	36	74
LT Vol	3	26	0	36	0
Through Vol	58	0	0	0	43
RT Vol	0	4	4	0	31
Lane Flow Rate	69	34	5	41	84
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.081	0.043	0.005	0.072	0.121
Departure Headway (Hd)	4.201	4.536	3.875	6.379	5.159
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	839	794	929	561	694
Service Time	2.294	2.536	1.877	4.119	2.898
HCM Lane V/C Ratio	0.082	0.043	0.005	0.073	0.121
HCM Control Delay	7.7	7.7	6.9	9.6	8.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.2	0.4

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	482	349	0	66	125
Future Vol, veh/h	0	482	349	0	66	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	548	397	0	75	142

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	945	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	548	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	283	577
Stage 1	0	-	-	0	666	-
Stage 2	0	-	-	0	567	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	283	577
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	567	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	425
HCM Lane V/C Ratio	-	-	0.511
HCM Control Delay (s)	-	-	22
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	2.8

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	443	0	0	347	87	54
Future Vol, veh/h	443	0	0	347	87	54
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	503	0	0	394	99	61
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	19.9	15.1	11.6
HCM LOS	C	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	87	54	443	347
LT Vol	87	0	0	0
Through Vol	0	0	443	347
RT Vol	0	54	0	0
Lane Flow Rate	99	61	503	394
Geometry Grp	7	7	2	2
Degree of Util (X)	0.217	0.105	0.716	0.573
Departure Headway (Hd)	7.908	6.164	5.123	5.23
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	454	581	710	690
Service Time	5.653	3.908	3.123	3.262
HCM Lane V/C Ratio	0.218	0.105	0.708	0.571
HCM Control Delay	12.8	9.6	19.9	15.1
HCM Lane LOS	B	A	C	C
HCM 95th-tile Q	0.8	0.4	6.1	3.7

Intersection	
Intersection Delay, s/veh	25.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	192	28	348	271	71	28	7	319	58	6	14
Future Vol, veh/h	9	192	28	348	271	71	28	7	319	58	6	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	10	209	30	378	295	77	30	8	347	63	7	15
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	17.2	31.5	21.1	13.5
HCM LOS	C	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	0%	100%	0%	100%	0%	74%
Vol Thru, %	20%	0%	0%	87%	0%	79%	8%
Vol Right, %	0%	100%	0%	13%	0%	21%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	319	9	220	348	342	78
LT Vol	28	0	9	0	348	0	58
Through Vol	7	0	0	192	0	271	6
RT Vol	0	319	0	28	0	71	14
Lane Flow Rate	38	347	10	239	378	372	85
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.084	0.662	0.022	0.498	0.837	0.686	0.197
Departure Headway (Hd)	7.996	6.871	8.097	7.49	7.965	6.645	8.386
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	449	527	442	481	454	543	427
Service Time	5.732	4.606	5.842	5.235	5.707	4.386	6.443
HCM Lane V/C Ratio	0.085	0.658	0.023	0.497	0.833	0.685	0.199
HCM Control Delay	11.5	22.1	11	17.5	40.1	22.7	13.5
HCM Lane LOS	B	C	B	C	E	C	B
HCM 95th-tile Q	0.3	4.8	0.1	2.7	8.2	5.2	0.7

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	27	0	3	0	0	4	3	70	0	35	63	29
Future Vol, veh/h	27	0	3	0	0	4	3	70	0	35	63	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	29	0	3	0	0	4	3	76	0	38	68	32
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.8	7	7.7	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	90%	0%	100%	0%
Vol Thru, %	96%	0%	0%	0%	68%
Vol Right, %	0%	10%	100%	0%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	30	4	35	92
LT Vol	3	27	0	35	0
Through Vol	70	0	0	0	63
RT Vol	0	3	4	0	29
Lane Flow Rate	79	33	4	38	100
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.093	0.042	0.005	0.067	0.145
Departure Headway (Hd)	4.208	4.618	3.93	6.382	5.235
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	837	780	916	561	684
Service Time	2.305	2.619	1.932	4.124	2.976
HCM Lane V/C Ratio	0.094	0.042	0.004	0.068	0.146
HCM Control Delay	7.7	7.8	7	9.6	8.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.2	0.5

Intersection	
Int Delay, s/veh	9.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	437	542	0	97	147
Future Vol, veh/h	0	437	542	0	97	147
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	475	589	0	105	160

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1064	589
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	475	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	240	444
Stage 1	0	-	-	0	543	-
Stage 2	0	-	-	0	613	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	240	444
Mov Cap-2 Maneuver	-	-	-	-	240	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	47.7
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	332
HCM Lane V/C Ratio	-	-	0.799
HCM Control Delay (s)	-	-	47.7
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	6.6

Intersection	
Intersection Delay, s/veh	22.7
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	424	0	0	487	118	99
Future Vol, veh/h	424	0	0	487	118	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	461	0	0	529	128	108
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	21.7	28	12.8
HCM LOS	C	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	99	424	487
LT Vol	118	0	0	0
Through Vol	0	0	424	487
RT Vol	0	99	0	0
Lane Flow Rate	128	108	461	529
Geometry Grp	7	7	2	2
Degree of Util (X)	0.294	0.194	0.718	0.811
Departure Headway (Hd)	8.243	6.494	5.607	5.513
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	435	550	645	656
Service Time	6.01	4.26	3.66	3.564
HCM Lane V/C Ratio	0.294	0.196	0.715	0.806
HCM Control Delay	14.4	10.8	21.7	28
HCM Lane LOS	B	B	C	D
HCM 95th-tile Q	1.2	0.7	6	8.3

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	230	18	198	159	29	5	4	197	64	3	3
Future Vol, veh/h	12	230	18	198	159	29	5	4	197	64	3	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	14	261	20	225	181	33	6	5	224	73	3	3
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	14.5	13.7	12.4	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	56%	0%	100%	0%	100%	0%	91%
Vol Thru, %	44%	0%	0%	93%	0%	85%	4%
Vol Right, %	0%	100%	0%	7%	0%	15%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	197	12	248	198	188	70
LT Vol	5	0	12	0	198	0	64
Through Vol	4	0	0	230	0	159	3
RT Vol	0	197	0	18	0	29	3
Lane Flow Rate	10	224	14	282	225	214	80
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.02	0.376	0.026	0.484	0.447	0.349	0.16
Departure Headway (Hd)	7.045	6.051	6.738	6.179	7.159	5.887	7.251
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	506	591	530	581	502	609	492
Service Time	4.811	3.816	4.5	3.94	4.917	3.644	5.333
HCM Lane V/C Ratio	0.02	0.379	0.026	0.485	0.448	0.351	0.163
HCM Control Delay	10	12.5	9.7	14.7	15.6	11.8	11.7
HCM Lane LOS	A	B	A	B	C	B	B
HCM 95th-tile Q	0.1	1.7	0.1	2.6	2.3	1.6	0.6

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	2	0	0	4	1	35	0	36	26	10
Future Vol, veh/h	7	0	2	0	0	4	1	35	0	36	26	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	8	0	2	0	0	5	1	40	0	41	30	11
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.3	6.7	7.4	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	78%	0%	100%	0%
Vol Thru, %	97%	0%	0%	0%	72%
Vol Right, %	0%	22%	100%	0%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	9	4	36	36
LT Vol	1	7	0	36	0
Through Vol	35	0	0	0	26
RT Vol	0	2	4	0	10
Lane Flow Rate	41	10	5	41	41
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.047	0.012	0.005	0.072	0.059
Departure Headway (Hd)	4.124	4.292	3.676	6.321	5.201
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	862	839	979	569	691
Service Time	2.178	2.293	1.676	4.036	2.915
HCM Lane V/C Ratio	0.048	0.012	0.005	0.072	0.059
HCM Control Delay	7.4	7.3	6.7	9.5	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2	0.2

Intersection	
Int Delay, s/veh	42.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	407	332	0	285	85
Future Vol, veh/h	0	407	332	0	285	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	463	377	0	324	97

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	840	377
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	328	593
Stage 1	0	-	-	0	681	-
Stage 2	0	-	-	0	621	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	328	593
Mov Cap-2 Maneuver	-	-	-	-	328	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	127.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	366
HCM Lane V/C Ratio	-	-	1.149
HCM Control Delay (s)	-	-	127.1
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	16.4

Intersection	
Intersection Delay, s/veh	106.5
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	623	0	0	584	51	269
Future Vol, veh/h	623	0	0	584	51	269
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	708	0	0	664	58	306
Number of Lanes	1	0	0	1	1	1

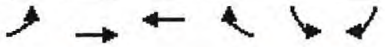
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	143.5	114.4	19.9
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	51	269	623	584
LT Vol	51	0	0	0
Through Vol	0	0	623	584
RT Vol	0	269	0	0
Lane Flow Rate	58	306	708	664
Geometry Grp	7	7	2	2
Degree of Util (X)	0.141	0.596	1.237	1.159
Departure Headway (Hd)	9.445	7.672	6.568	6.656
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	382	474	559	551
Service Time	7.145	5.372	4.568	4.656
HCM Lane V/C Ratio	0.152	0.646	1.267	1.205
HCM Control Delay	13.7	21.1	143.5	114.4
HCM Lane LOS	B	C	F	F
HCM 95th-tile Q	0.5	3.8	26	21.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	230	18	198	159	29	5	4	197	64	3	3
Future Volume (veh/h)	12	230	18	198	159	29	5	4	197	64	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1357	1863	1900	1900	1863	1520	1900	1863	1900
Adj Flow Rate, veh/h	14	261	20	225	181	33	6	5	0	73	3	3
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	40	2	2	2	2	25	2	2	2
Cap, veh/h	24	308	24	259	564	103	457	362	606	702	29	25
Arrive On Green	0.01	0.18	0.18	0.20	0.37	0.37	0.47	0.47	0.00	0.47	0.47	0.47
Sat Flow, veh/h	1774	1709	131	1293	1534	280	827	772	1292	1312	62	54
Grp Volume(v), veh/h	14	0	281	225	0	214	11	0	0	79	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1840	1293	0	1813	1598	0	1292	1427	0	0
Q Serve(g_s), s	0.6	0.0	11.8	13.5	0.0	6.8	0.0	0.0	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s	0.6	0.0	11.8	13.5	0.0	6.8	0.3	0.0	0.0	2.4	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.15	0.55		1.00	0.92		0.04
Lane Grp Cap(c), veh/h	24	0	332	259	0	667	819	0	606	756	0	0
V/C Ratio(X)	0.59	0.00	0.85	0.87	0.00	0.32	0.01	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	89	0	483	452	0	1020	819	0	606	756	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.2	0.0	31.7	30.9	0.0	18.1	11.3	0.0	0.0	11.9	0.0	0.0
Incr Delay (d2), s/veh	21.2	0.0	9.1	8.6	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.9	5.4	0.0	3.4	0.1	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	60.4	0.0	40.9	39.5	0.0	18.4	11.4	0.0	0.0	12.2	0.0	0.0
LnGrp LOS	E		D	D		B	B			B		
Approach Vol, veh/h		295			439			11			79	
Approach Delay, s/veh		41.8			29.2			11.4			12.2	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		41.5	20.1	18.4		41.5	5.1	33.4
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	28.0	21.0		19.0	4.0	45.0
Max Q Clear Time (g_c+I1), s		2.3	15.5	13.8		4.4	2.6	8.8
Green Ext Time (p_c), s		0.0	0.7	0.6		0.2	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		⋎	
Traffic Volume (veh/h)	0	407	332	0	285	85
Future Volume (veh/h)	0	407	332	0	285	85
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1764	1770	0	1647	1900
Adj Flow Rate, veh/h	0	462	377	0	324	97
Adj No. of Lanes	0	1	1	0	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	5	10	0	0	0
Cap, veh/h	0	519	521	0	710	212
Arrive On Green	0.00	0.29	0.29	0.00	0.61	0.61
Sat Flow, veh/h	0	1764	1770	0	1172	351
Grp Volume(v), veh/h	0	462	377	0	422	0
Grp Sat Flow(s),veh/h/ln	0	1764	1770	0	1526	0
Q Serve(g_s), s	0.0	20.0	15.3	0.0	12.1	0.0
Cycle Q Clear(g_c), s	0.0	20.0	15.3	0.0	12.1	0.0
Prop In Lane	0.00			0.00	0.77	0.23
Lane Grp Cap(c), veh/h	0	519	521	0	924	0
V/C Ratio(X)	0.00	0.89	0.72	0.00	0.46	0.00
Avail Cap(c_a), veh/h	0	750	752	0	924	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	27.0	25.3	0.0	8.6	0.0
Incr Delay (d2), s/veh	0.0	9.4	1.9	0.0	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.1	7.7	0.0	5.5	0.0
LnGrp Delay(d),s/veh	0.0	36.3	27.2	0.0	10.2	0.0
LnGrp LOS		D	C		B	
Approach Vol, veh/h		462	377		422	
Approach Delay, s/veh		36.3	27.2		10.2	
Approach LOS		D	C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				27.5		52.5		27.5
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				34.0		38.0		34.0
Max Q Clear Time (g_c+I1), s				22.0		14.1		17.3
Green Ext Time (p_c), s				1.5		1.9		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	623	0	0	584	51	269
Future Volume (veh/h)	623	0	0	584	51	269
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1855	0	0	1764	1357	1727
Adj Flow Rate, veh/h	708	0	0	664	58	306
Adj No. of Lanes	1	0	0	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	0	0	5	40	10
Cap, veh/h	781	0	0	743	619	703
Arrive On Green	0.42	0.00	0.00	0.42	0.48	0.48
Sat Flow, veh/h	1855	0	0	1764	1293	1468
Grp Volume(v), veh/h	708	0	0	664	58	306
Grp Sat Flow(s),veh/h/ln	1855	0	0	1764	1293	1468
Q Serve(g_s), s	28.6	0.0	0.0	28.0	2.0	11.0
Cycle Q Clear(g_c), s	28.6	0.0	0.0	28.0	2.0	11.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	781	0	0	743	619	703
V/C Ratio(X)	0.91	0.00	0.00	0.89	0.09	0.44
Avail Cap(c_a), veh/h	1113	0	0	1059	619	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	0.0	0.0	21.5	11.4	13.7
Incr Delay (d2), s/veh	8.1	0.0	0.0	7.4	0.3	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	0.0	15.0	0.7	4.8
LnGrp Delay(d),s/veh	29.8	0.0	0.0	28.9	11.7	15.7
LnGrp LOS	C			C	B	B
Approach Vol, veh/h	708			664	364	
Approach Delay, s/veh	29.8			28.9	15.0	
Approach LOS	C			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		42.3		37.7				37.7
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		24.0		48.0				48.0
Max Q Clear Time (g_c+I1), s		13.0		30.6				30.0
Green Ext Time (p_c), s		1.3		3.1				2.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	19.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	200	17	256	276	126	18	7	212	105	6	14
Future Vol, veh/h	9	200	17	256	276	126	18	7	212	105	6	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	10	217	18	278	300	137	20	8	230	114	7	15
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	15.8	24.2	14.4	14.2
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	72%	0%	100%	0%	100%	0%	84%
Vol Thru, %	28%	0%	0%	92%	0%	69%	5%
Vol Right, %	0%	100%	0%	8%	0%	31%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	212	9	217	256	402	125
LT Vol	18	0	9	0	256	0	105
Through Vol	7	0	0	200	0	276	6
RT Vol	0	212	0	17	0	126	14
Lane Flow Rate	27	230	10	236	278	437	136
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.06	0.438	0.021	0.467	0.593	0.762	0.297
Departure Headway (Hd)	7.924	6.839	7.701	7.132	7.674	6.282	7.874
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	452	528	465	505	473	581	457
Service Time	5.665	4.579	5.447	4.877	5.374	3.982	5.918
HCM Lane V/C Ratio	0.06	0.436	0.022	0.467	0.588	0.752	0.298
HCM Control Delay	11.2	14.8	10.6	16	20.9	26.3	14.2
HCM Lane LOS	B	B	B	C	C	D	B
HCM 95th-tile Q	0.2	2.2	0.1	2.4	3.8	6.9	1.2

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	1	0	0	4	1	68	0	35	89	8
Future Vol, veh/h	7	0	1	0	0	4	1	68	0	35	89	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	8	0	1	0	0	4	1	74	0	38	97	9
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.7	6.9	7.6	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	1%	88%	0%	100%	0%
Vol Thru, %	99%	0%	0%	0%	92%
Vol Right, %	0%	12%	100%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	8	4	35	97
LT Vol	1	7	0	35	0
Through Vol	68	0	0	0	89
RT Vol	0	1	4	0	8
Lane Flow Rate	75	9	4	38	105
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.087	0.011	0.005	0.067	0.157
Departure Headway (Hd)	4.164	4.608	3.912	6.337	5.353
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	849	781	920	567	672
Service Time	2.245	2.609	1.912	4.056	3.072
HCM Lane V/C Ratio	0.088	0.012	0.004	0.067	0.156
HCM Control Delay	7.6	7.7	6.9	9.5	9.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0	0	0.2	0.6

Intersection	
Int Delay, s/veh	146.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	400	524	0	358	143
Future Vol, veh/h	0	400	524	0	358	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	435	570	0	389	155

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1005	570
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	435	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	~ 261	456
Stage 1	0	-	-	0	554	-
Stage 2	0	-	-	0	640	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	~ 261	456
Mov Cap-2 Maneuver	-	-	-	-	~ 261	-
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	$ 417.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	297
HCM Lane V/C Ratio	-	-	1.834
HCM Control Delay (s)	-	-	$ 417.2
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	36.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	163.2
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	668	0	0	706	125	355
Future Vol, veh/h	668	0	0	706	125	355
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	726	0	0	767	136	386
Number of Lanes	1	0	0	1	1	1

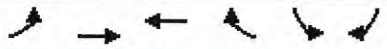
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	194.1	225.9	28.1
HCM LOS	F	F	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	355	668	706
LT Vol	125	0	0	0
Through Vol	0	0	668	706
RT Vol	0	355	0	0
Lane Flow Rate	136	386	726	767
Geometry Grp	7	7	2	2
Degree of Util (X)	0.331	0.757	1.354	1.431
Departure Headway (Hd)	9.871	8.087	7.355	7.261
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	367	451	501	506
Service Time	7.571	5.787	5.355	5.261
HCM Lane V/C Ratio	0.371	0.856	1.449	1.516
HCM Control Delay	17.4	31.9	194.1	225.9
HCM Lane LOS	C	D	F	F
HCM 95th-tile Q	1.4	6.4	30	34.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	200	17	256	276	126	18	7	212	105	6	14
Future Volume (veh/h)	9	200	17	256	276	126	18	7	212	105	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1357	1863	1900	1900	1863	1520	1900	1863	1900
Adj Flow Rate, veh/h	10	217	18	278	300	137	20	8	0	114	7	15
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	40	2	2	2	2	25	2	2	2
Cap, veh/h	18	262	22	314	469	214	559	211	585	624	41	72
Arrive On Green	0.01	0.15	0.15	0.24	0.39	0.39	0.45	0.45	0.00	0.45	0.45	0.45
Sat Flow, veh/h	1774	1697	141	1293	1212	553	1065	467	1292	1195	91	159
Grp Volume(v), veh/h	10	0	235	278	0	437	28	0	0	136	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1838	1293	0	1765	1532	0	1292	1445	0	0
Q Serve(g_s), s	0.4	0.0	9.9	16.6	0.0	16.1	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	0.4	0.0	9.9	16.6	0.0	16.1	0.7	0.0	0.0	4.4	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.31	0.71		1.00	0.84		0.11
Lane Grp Cap(c), veh/h	18	0	284	314	0	684	771	0	585	737	0	0
V/C Ratio(X)	0.57	0.00	0.83	0.88	0.00	0.64	0.04	0.00	0.00	0.18	0.00	0.00
Avail Cap(c_a), veh/h	89	0	414	501	0	993	771	0	585	737	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.4	0.0	32.8	29.2	0.0	19.9	12.2	0.0	0.0	13.1	0.0	0.0
Incr Delay (d2), s/veh	25.4	0.0	8.9	11.0	0.0	1.0	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	5.7	6.8	0.0	8.0	0.4	0.0	0.0	1.9	0.0	0.0
LnGrp Delay(d),s/veh	64.8	0.0	41.7	40.2	0.0	20.9	12.3	0.0	0.0	13.7	0.0	0.0
LnGrp LOS	E		D	D		C	B			B		
Approach Vol, veh/h		245			715			28			136	
Approach Delay, s/veh		42.7			28.4			12.3			13.7	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.2	23.5	16.3		40.2	4.8	35.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		19.0	31.0	18.0		19.0	4.0	45.0
Max Q Clear Time (g_c+I1), s		2.7	18.6	11.9		6.4	2.4	18.1
Green Ext Time (p_c), s		0.0	0.9	0.4		0.3	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	29.3
HCM 2010 LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↱	
Traffic Volume (veh/h)	0	400	524	0	358	143
Future Volume (veh/h)	0	400	524	0	358	143
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1764	1770	0	1622	1900
Adj Flow Rate, veh/h	0	435	570	0	389	155
Adj No. of Lanes	0	1	1	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	5	10	0	0	0
Cap, veh/h	0	621	623	0	584	233
Arrive On Green	0.00	0.35	0.35	0.00	0.55	0.55
Sat Flow, veh/h	0	1764	1770	0	1066	425
Grp Volume(v), veh/h	0	435	570	0	545	0
Grp Sat Flow(s),veh/h/ln	0	1764	1770	0	1494	0
Q Serve(g_s), s	0.0	17.0	24.6	0.0	20.8	0.0
Cycle Q Clear(g_c), s	0.0	17.0	24.6	0.0	20.8	0.0
Prop In Lane	0.00			0.00	0.71	0.28
Lane Grp Cap(c), veh/h	0	621	623	0	819	0
V/C Ratio(X)	0.00	0.70	0.91	0.00	0.67	0.00
Avail Cap(c_a), veh/h	0	750	752	0	819	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	22.3	24.8	0.0	12.9	0.0
Incr Delay (d2), s/veh	0.0	2.3	14.0	0.0	4.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.6	14.5	0.0	9.4	0.0
LnGrp Delay(d),s/veh	0.0	24.6	38.8	0.0	17.1	0.0
LnGrp LOS		C	D		B	
Approach Vol, veh/h		435	570		545	
Approach Delay, s/veh		24.6	38.8		17.1	
Approach LOS		C	D		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				32.2		47.8		32.2
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				34.0		38.0		34.0
Max Q Clear Time (g_c+I1), s				19.0		22.8		26.6
Green Ext Time (p_c), s				1.5		2.3		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.2
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	668	0	0	706	125	355
Future Volume (veh/h)	668	0	0	706	125	355
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1855	0	0	1764	1357	1727
Adj Flow Rate, veh/h	726	0	0	767	136	386
Adj No. of Lanes	1	0	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	0	0	5	40	10
Cap, veh/h	872	0	0	830	556	631
Arrive On Green	0.47	0.00	0.00	0.47	0.43	0.43
Sat Flow, veh/h	1855	0	0	1764	1293	1468
Grp Volume(v), veh/h	726	0	0	767	136	386
Grp Sat Flow(s),veh/h/ln	1855	0	0	1764	1293	1468
Q Serve(g_s), s	27.3	0.0	0.0	32.6	5.4	16.3
Cycle Q Clear(g_c), s	27.3	0.0	0.0	32.6	5.4	16.3
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	872	0	0	830	556	631
V/C Ratio(X)	0.83	0.00	0.00	0.92	0.24	0.61
Avail Cap(c_a), veh/h	1090	0	0	1037	556	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	0.0	0.0	19.9	14.5	17.6
Incr Delay (d2), s/veh	4.6	0.0	0.0	11.7	1.0	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.0	0.0	0.0	18.5	2.1	7.3
LnGrp Delay(d),s/veh	23.1	0.0	0.0	31.6	15.6	22.0
LnGrp LOS	C			C	B	C
Approach Vol, veh/h	726			767	522	
Approach Delay, s/veh	23.1			31.6	20.3	
Approach LOS	C			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		38.4		41.6				41.6
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		25.0		47.0				47.0
Max Q Clear Time (g_c+I1), s		18.3		29.3				34.6
Green Ext Time (p_c), s		1.4		3.2				3.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	26
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	230	28	336	159	29	14	4	319	64	3	3
Future Vol, veh/h	12	230	28	336	159	29	14	4	319	64	3	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	14	261	32	382	181	33	16	5	363	73	3	3
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	20.1	32.8	22.7	13.8
HCM LOS	C	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	78%	0%	100%	0%	100%	0%	91%
Vol Thru, %	22%	0%	0%	89%	0%	85%	4%
Vol Right, %	0%	100%	0%	11%	0%	15%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	319	12	258	336	188	70
LT Vol	14	0	12	0	336	0	64
Through Vol	4	0	0	230	0	159	3
RT Vol	0	319	0	28	0	29	3
Lane Flow Rate	20	362	14	293	382	214	80
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.045	0.688	0.03	0.598	0.857	0.403	0.191
Departure Headway (Hd)	7.948	6.833	7.936	7.343	8.083	6.799	8.66
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	451	529	451	490	447	528	413
Service Time	5.694	4.579	5.695	5.102	5.839	4.554	6.739
HCM Lane V/C Ratio	0.044	0.684	0.031	0.598	0.855	0.405	0.194
HCM Control Delay	11.1	23.4	10.9	20.5	43.3	14.1	13.8
HCM Lane LOS	B	C	B	C	E	B	B
HCM 95th-tile Q	0.1	5.3	0.1	3.9	8.6	1.9	0.7

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Vol, veh/h	26	0	4	0	0	4	3	61	0	36	50	31
Future Vol, veh/h	26	0	4	0	0	4	3	61	0	36	50	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	30	0	5	0	0	5	3	69	0	41	57	35
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.8	6.9	7.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	87%	0%	100%	0%
Vol Thru, %	95%	0%	0%	0%	62%
Vol Right, %	0%	13%	100%	0%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	30	4	36	81
LT Vol	3	26	0	36	0
Through Vol	61	0	0	0	50
RT Vol	0	4	4	0	31
Lane Flow Rate	73	34	5	41	92
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.085	0.043	0.005	0.073	0.133
Departure Headway (Hd)	4.207	4.566	3.905	6.381	5.186
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	838	789	922	561	690
Service Time	2.303	2.566	1.907	4.121	2.926
HCM Lane V/C Ratio	0.087	0.043	0.005	0.073	0.133
HCM Control Delay	7.7	7.8	6.9	9.6	8.7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.2	0.5

Intersection	
Int Delay, s/veh	97.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	0	493	425	0	285	129
Future Vol, veh/h	0	493	425	0	285	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	560	483	0	324	147

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1043	483
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	560	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	~ 247	513
Stage 1	0	-	-	0	608	-
Stage 2	0	-	-	0	560	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	~ 247	513
Mov Cap-2 Maneuver	-	-	-	-	~ 247	-
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	$ 314.3
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	295
HCM Lane V/C Ratio	-	-	1.595
HCM Control Delay (s)	-	-	$ 314.3
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	28.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	143.9
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	670	0	0	636	91	269
Future Vol, veh/h	670	0	0	636	91	269
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	761	0	0	723	103	306
Number of Lanes	1	0	0	1	1	1

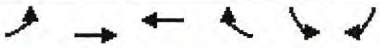
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	191.6	163.7	20.3
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	269	670	636
LT Vol	91	0	0	0
Through Vol	0	0	670	636
RT Vol	0	269	0	0
Lane Flow Rate	103	306	761	723
Geometry Grp	7	7	2	2
Degree of Util (X)	0.252	0.6	1.353	1.284
Departure Headway (Hd)	9.715	7.935	6.83	6.91
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	372	459	541	535
Service Time	7.415	5.635	4.83	4.91
HCM Lane V/C Ratio	0.277	0.667	1.407	1.351
HCM Control Delay	15.7	21.8	191.6	163.7
HCM Lane LOS	C	C	F	F
HCM 95th-tile Q	1	3.8	31.7	27.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	230	28	336	159	29	14	4	319	64	3	3
Future Volume (veh/h)	12	230	28	336	159	29	14	4	319	64	3	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1357	1863	1900	1900	1863	1520	1900	1863	1900
Adj Flow Rate, veh/h	14	261	32	382	181	33	16	5	0	73	3	3
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	40	2	2	2	2	25	2	2	2
Cap, veh/h	24	304	37	415	759	138	466	135	442	536	22	19
Arrive On Green	0.01	0.19	0.19	0.32	0.49	0.49	0.34	0.34	0.00	0.34	0.34	0.34
Sat Flow, veh/h	1774	1628	200	1293	1534	280	1130	396	1292	1314	65	54
Grp Volume(v), veh/h	14	0	293	382	0	214	21	0	0	79	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1828	1293	0	1813	1525	0	1292	1433	0	0
Q Serve(g_s), s	0.6	0.0	12.4	22.8	0.0	5.4	0.0	0.0	0.0	2.3	0.0	0.0
Cycle Q Clear(g_c), s	0.6	0.0	12.4	22.8	0.0	5.4	0.6	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.15	0.76		1.00	0.92		0.04
Lane Grp Cap(c), veh/h	24	0	342	415	0	897	601	0	442	577	0	0
V/C Ratio(X)	0.59	0.00	0.86	0.92	0.00	0.24	0.03	0.00	0.00	0.14	0.00	0.00
Avail Cap(c_a), veh/h	89	0	457	501	0	1065	601	0	442	577	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.2	0.0	31.5	26.2	0.0	11.6	17.5	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	21.2	0.0	11.7	20.2	0.0	0.1	0.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	7.4	10.4	0.0	2.7	0.3	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	60.4	0.0	43.2	46.4	0.0	11.7	17.6	0.0	0.0	18.7	0.0	0.0
LnGrp LOS	E		D	D		B	B			B		
Approach Vol, veh/h		307			596			21			79	
Approach Delay, s/veh		44.0			33.9			17.6			18.7	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.4	29.7	19.0		31.4	5.1	43.6
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	31.0	20.0		17.0	4.0	47.0
Max Q Clear Time (g_c+I1), s		2.6	24.8	14.4		4.9	2.6	7.4
Green Ext Time (p_c), s		0.0	0.9	0.5		0.2	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Volume (veh/h)	0	493	425	0	285	129
Future Volume (veh/h)	0	493	425	0	285	129
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1764	1770	0	1610	1900
Adj Flow Rate, veh/h	0	560	483	0	324	147
Adj No. of Lanes	0	1	1	0	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	5	10	0	0	0
Cap, veh/h	0	615	617	0	559	254
Arrive On Green	0.00	0.35	0.35	0.00	0.55	0.55
Sat Flow, veh/h	0	1764	1770	0	1015	460
Grp Volume(v), veh/h	0	560	483	0	472	0
Grp Sat Flow(s),veh/h/ln	0	1764	1770	0	1478	0
Q Serve(g_s), s	0.0	24.2	19.5	0.0	16.8	0.0
Cycle Q Clear(g_c), s	0.0	24.2	19.5	0.0	16.8	0.0
Prop In Lane	0.00			0.00	0.69	0.31
Lane Grp Cap(c), veh/h	0	615	617	0	815	0
V/C Ratio(X)	0.00	0.91	0.78	0.00	0.58	0.00
Avail Cap(c_a), veh/h	0	772	775	0	815	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	24.9	23.3	0.0	11.8	0.0
Incr Delay (d2), s/veh	0.0	12.8	4.1	0.0	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.0	10.2	0.0	7.5	0.0
LnGrp Delay(d),s/veh	0.0	37.7	27.5	0.0	14.8	0.0
LnGrp LOS		D	C		B	
Approach Vol, veh/h		560	483		472	
Approach Delay, s/veh		37.7	27.5		14.8	
Approach LOS		D	C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				31.9		48.1		31.9
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				35.0		37.0		35.0
Max Q Clear Time (g_c+I1), s				26.2		18.8		21.5
Green Ext Time (p_c), s				1.7		2.1		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	670	0	0	636	91	269
Future Volume (veh/h)	670	0	0	636	91	269
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1855	0	0	1764	1357	1727
Adj Flow Rate, veh/h	761	0	0	723	103	306
Adj No. of Lanes	1	0	0	1	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	0	0	5	40	10
Cap, veh/h	832	0	0	791	584	663
Arrive On Green	0.45	0.00	0.00	0.45	0.45	0.45
Sat Flow, veh/h	1855	0	0	1764	1293	1468
Grp Volume(v), veh/h	761	0	0	723	103	306
Grp Sat Flow(s),veh/h/ln	1855	0	0	1764	1293	1468
Q Serve(g_s), s	30.7	0.0	0.0	30.6	3.8	11.6
Cycle Q Clear(g_c), s	30.7	0.0	0.0	30.6	3.8	11.6
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	832	0	0	791	584	663
V/C Ratio(X)	0.91	0.00	0.00	0.91	0.18	0.46
Avail Cap(c_a), veh/h	1090	0	0	1037	584	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	0.0	0.0	20.6	13.1	15.2
Incr Delay (d2), s/veh	9.8	0.0	0.0	10.1	0.7	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.9	0.0	0.0	17.1	1.5	5.1
LnGrp Delay(d),s/veh	30.4	0.0	0.0	30.7	13.7	17.5
LnGrp LOS	C			C	B	B
Approach Vol, veh/h	761			723	409	
Approach Delay, s/veh	30.4			30.7	16.6	
Approach LOS	C			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		40.1		39.9				39.9
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		25.0		47.0				47.0
Max Q Clear Time (g_c+I1), s		13.6		32.7				32.6
Green Ext Time (p_c), s		1.5		3.2				3.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.5
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	42
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	200	28	398	276	126	28	7	344	105	6	14
Future Vol, veh/h	9	200	28	398	276	126	28	7	344	105	6	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	40	2	2	2	2	25	2	2	2
Mvmt Flow	10	217	30	433	300	137	30	8	374	114	7	15
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	20.1	59.5	27.4	16.2
HCM LOS	C	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	0%	100%	0%	100%	0%	84%
Vol Thru, %	20%	0%	0%	88%	0%	69%	5%
Vol Right, %	0%	100%	0%	12%	0%	31%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	344	9	228	398	402	125
LT Vol	28	0	9	0	398	0	105
Through Vol	7	0	0	200	0	276	6
RT Vol	0	344	0	28	0	126	14
Lane Flow Rate	38	374	10	248	433	437	136
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.088	0.75	0.023	0.549	1.023	0.863	0.329
Departure Headway (Hd)	8.51	7.379	8.776	8.169	8.516	7.112	8.913
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	423	494	410	444	428	511	406
Service Time	6.21	5.079	6.476	5.869	6.216	4.812	6.913
HCM Lane V/C Ratio	0.09	0.757	0.024	0.559	1.012	0.855	0.335
HCM Control Delay	12	29	11.7	20.4	79.2	39.9	16.2
HCM Lane LOS	B	D	B	C	F	E	C
HCM 95th-tile Q	0.3	6.4	0.1	3.2	13.4	9.2	1.4

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	3	0	0	4	3	95	0	35	114	29
Future Vol, veh/h	27	0	3	0	0	4	3	95	0	35	114	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	50	2	2	2	75	50	2
Mvmt Flow	29	0	3	0	0	4	3	103	0	38	124	32
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	8.1	7.2	8	9.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	3%	90%	0%	100%	0%
Vol Thru, %	97%	0%	0%	0%	80%
Vol Right, %	0%	10%	100%	0%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	98	30	4	35	143
LT Vol	3	27	0	35	0
Through Vol	95	0	0	0	114
RT Vol	0	3	4	0	29
Lane Flow Rate	107	33	4	38	155
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.129	0.044	0.005	0.068	0.23
Departure Headway (Hd)	4.368	4.827	4.141	6.396	5.327
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	824	745	868	559	671
Service Time	2.375	2.833	2.15	4.149	3.08
HCM Lane V/C Ratio	0.13	0.044	0.005	0.068	0.231
HCM Control Delay	8	8.1	7.2	9.6	9.7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0	0.2	0.9

Intersection	
Int Delay, s/veh	239.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		⋔	
Traffic Vol, veh/h	0	493	620	0	358	190
Future Vol, veh/h	0	493	620	0	358	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	5	-5	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	5	10	10	8	40
Mvmt Flow	0	536	674	0	389	207

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1210	674
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	-	-	-	-	6.48	6.6
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	-	-	3.572	3.66
Pot Cap-1 Maneuver	0	-	-	0	~ 196	395
Stage 1	0	-	-	0	495	-
Stage 2	0	-	-	0	575	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	~ 196	395
Mov Cap-2 Maneuver	-	-	-	-	~ 196	-
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	575	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	$ 725.5
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	237
HCM Lane V/C Ratio	-	-	2.513
HCM Control Delay (s)	-	-	-$ 725.5
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	49.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	201.5
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	719	0	0	760	166	355
Future Vol, veh/h	719	0	0	760	166	355
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	5	40	10
Mvmt Flow	782	0	0	826	180	386
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	244	279.6	28.8
HCM LOS	F	F	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	0%
Vol Thru, %	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	355	719	760
LT Vol	166	0	0	0
Through Vol	0	0	719	760
RT Vol	0	355	0	0
Lane Flow Rate	180	386	782	826
Geometry Grp	7	7	2	2
Degree of Util (X)	0.44	0.757	1.471	1.555
Departure Headway (Hd)	10.109	8.319	7.576	7.473
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	359	440	485	496
Service Time	7.809	6.019	5.576	5.473
HCM Lane V/C Ratio	0.501	0.877	1.612	1.665
HCM Control Delay	20.5	32.7	244	279.6
HCM Lane LOS	C	D	F	F
HCM 95th-tile Q	2.2	6.3	35.4	40.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	200	28	398	276	126	28	7	344	105	6	14
Future Volume (veh/h)	9	200	28	398	276	126	28	7	344	105	6	14
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1357	1863	1900	1900	1863	1520	1900	1863	1900
Adj Flow Rate, veh/h	10	217	30	433	300	137	30	8	0	114	7	15
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	40	2	2	2	2	25	2	2	2
Cap, veh/h	18	258	36	467	621	283	465	115	423	475	32	53
Arrive On Green	0.01	0.16	0.16	0.36	0.51	0.51	0.33	0.33	0.00	0.33	0.33	0.33
Sat Flow, veh/h	1774	1602	221	1293	1212	553	1172	350	1292	1196	97	160
Grp Volume(v), veh/h	10	0	247	433	0	437	38	0	0	136	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1824	1293	0	1765	1522	0	1292	1454	0	0
Q Serve(g_s), s	0.4	0.0	10.5	25.7	0.0	12.8	0.0	0.0	0.0	4.1	0.0	0.0
Cycle Q Clear(g_c), s	0.4	0.0	10.5	25.7	0.0	12.8	1.2	0.0	0.0	5.3	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.31	0.79		1.00	0.84		0.11
Lane Grp Cap(c), veh/h	18	0	294	467	0	904	579	0	423	559	0	0
V/C Ratio(X)	0.57	0.00	0.84	0.93	0.00	0.48	0.07	0.00	0.00	0.24	0.00	0.00
Avail Cap(c_a), veh/h	89	0	388	565	0	1059	579	0	423	559	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.4	0.0	32.6	24.5	0.0	12.6	18.5	0.0	0.0	19.8	0.0	0.0
Incr Delay (d2), s/veh	25.4	0.0	12.0	19.5	0.0	0.4	0.2	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	6.3	11.7	0.0	6.3	0.6	0.0	0.0	2.4	0.0	0.0
LnGrp Delay(d),s/veh	64.8	0.0	44.6	44.0	0.0	13.0	18.7	0.0	0.0	20.8	0.0	0.0
LnGrp LOS	E		D	D		B	B			C		
Approach Vol, veh/h		257			870			38			136	
Approach Delay, s/veh		45.4			28.5			18.7			20.8	
Approach LOS		D			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.2	32.9	16.9		30.2	4.8	45.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	35.0	17.0		16.0	4.0	48.0
Max Q Clear Time (g_c+I1), s		3.2	27.7	12.5		7.3	2.4	14.8
Green Ext Time (p_c), s		0.1	1.2	0.4		0.3	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.7
HCM 2010 LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Volume (veh/h)	0	493	620	0	358	190
Future Volume (veh/h)	0	493	620	0	358	190
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1764	1770	0	1595	1900
Adj Flow Rate, veh/h	0	536	674	0	389	207
Adj No. of Lanes	0	1	1	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	5	10	0	0	0
Cap, veh/h	0	715	718	0	470	250
Arrive On Green	0.00	0.41	0.41	0.00	0.49	0.49
Sat Flow, veh/h	0	1764	1770	0	950	506
Grp Volume(v), veh/h	0	536	674	0	597	0
Grp Sat Flow(s),veh/h/ln	0	1764	1770	0	1458	0
Q Serve(g_s), s	0.0	20.8	29.2	0.0	28.0	0.0
Cycle Q Clear(g_c), s	0.0	20.8	29.2	0.0	28.0	0.0
Prop In Lane	0.00			0.00	0.65	0.35
Lane Grp Cap(c), veh/h	0	715	718	0	721	0
V/C Ratio(X)	0.00	0.75	0.94	0.00	0.83	0.00
Avail Cap(c_a), veh/h	0	772	775	0	721	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	20.3	22.8	0.0	17.3	0.0
Incr Delay (d2), s/veh	0.0	3.8	18.4	0.0	10.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.7	17.9	0.0	13.2	0.0
LnGrp Delay(d),s/veh	0.0	24.1	41.3	0.0	27.8	0.0
LnGrp LOS		C	D		C	
Approach Vol, veh/h		536	674		597	
Approach Delay, s/veh		24.1	41.3		27.8	
Approach LOS		C	D		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				36.4		43.6		36.4
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				35.0		37.0		35.0
Max Q Clear Time (g_c+I1), s				22.8		30.0		31.2
Green Ext Time (p_c), s				1.9		1.7		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	719	0	0	760	166	355
Future Volume (veh/h)	719	0	0	760	166	355
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1855	0	0	1764	1357	1727
Adj Flow Rate, veh/h	782	0	0	826	180	386
Adj No. of Lanes	1	0	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	0	0	5	40	10
Cap, veh/h	930	0	0	884	515	585
Arrive On Green	0.50	0.00	0.00	0.50	0.40	0.40
Sat Flow, veh/h	1855	0	0	1764	1293	1468
Grp Volume(v), veh/h	782	0	0	826	180	386
Grp Sat Flow(s),veh/h/ln	1855	0	0	1764	1293	1468
Q Serve(g_s), s	29.1	0.0	0.0	35.1	7.8	17.2
Cycle Q Clear(g_c), s	29.1	0.0	0.0	35.1	7.8	17.2
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	930	0	0	884	515	585
V/C Ratio(X)	0.84	0.00	0.00	0.93	0.35	0.66
Avail Cap(c_a), veh/h	1090	0	0	1037	515	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	0.0	18.7	16.8	19.6
Incr Delay (d2), s/veh	5.3	0.0	0.0	13.5	1.9	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	0.0	0.0	20.3	3.0	7.9
LnGrp Delay(d),s/veh	22.5	0.0	0.0	32.2	18.7	25.4
LnGrp LOS	C			C	B	C
Approach Vol, veh/h	782			826	566	
Approach Delay, s/veh	22.5			32.2	23.2	
Approach LOS	C			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		35.9		44.1				44.1
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		25.0		47.0				47.0
Max Q Clear Time (g_c+I1), s		19.2		31.1				37.1
Green Ext Time (p_c), s		1.4		3.4				3.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C

Initial Study

Orland Commerce Plaza Project

October 2019

Lead Agency:

City of Orland
815 Fourth Street
Orland, CA 95963

Prepared by:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

55 Hanover Lane
Suite A
Chico, CA 95973

THIS PAGE INTENTIONALLY LEFT BLANK

DRAFT INITIAL STUDY FOR THE COMMERCE LANE PLAZA COMMERCIAL PROJECT

Lead Agency: City of Orland

Project Proponent: Land Developers, Inc.
60 Independence Circle Suite 202,
Chico, CA 95973

Project Location:

- The Project is located in the City of Orland at 4473 and 4483 Commerce Lane (Commerce Lane is known as County Road HH outside of City limits).
- The approximate center of the site is located at latitude 39°45'04" N and longitude 122°12'35" W.
- The Project site is located on assessor parcel numbers (APNs) #045-170-041 (parcel A) and #045-170-042 (parcel B).
- The Project site is bordered by Eagle's Hall to the north, the Pilot Flying J Travel Center (truck stop) across Commerce Lane (County Road HH) to the east, and agricultural land supporting limited rural development to the south and west.
- The land directly to the south has been approved for development as SKP Ranch LLC which includes a sit-down restaurant and 80-room hotel. The land on the south side of County Road 13 has been proposed for the Orland Sunny Truck Service Center.
- A hotel is proposed on the ±1.36- acre parcel directly adjacent to the Project site.
- The Project site itself currently has no existing development on site. See the maps named **Figure 1. Project Vicinity** and **Figure 2. Project Location**.

Project Description: The Project proposes a change of zoning. The land use designation will remain:

- Zoning: *O-S - Open Space* to *C-H - Highway Service Commercial*
- City of Orland General Plan land use designation: *C - Commercial*

The Applicant is proposing a project consisting of two 2,000 sq. ft. restaurants and a 4,500 sq. ft. restaurant on Parcel A and a 3,400 sq. ft. convenience store and restaurant with fueling bays and a car wash on Parcel B.

Public Review Period: To be determined

THIS PAGE INTENTIONALLY LEFT BLANK

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ADWF	Average dry weather flow
AF	Acre-feet
AMSL	Above mean sea level
APN	Assessor Parcel Number
AQMP	Air Quality Management Plan
BMPs	Best Management Practices
BRA	Biological Resource Assessment
CAA	Federal Clean Air Act
C	Commercial (General Plan designation)
C-2	Community Commercial
C-H	Highway Service Commercial (zoning)
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Society
CH_4	Methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CRHR	California Register of Historic Places
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dBA	A-weighted decibels
DEIR	Draft Environmental Impact Report
DOC	California Department of Conservation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
ECHO	Enforcement and Compliance History Online
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map

ACRONYMS AND ABBREVIATIONS

FMMP	Farmland Mapping and Monitoring Program
GCAPCD	Glenn County Air Pollution Control District
GHGs	Greenhouse Gases
GICIMA	Groundwater Information Center Interactive Map Application
gpd	Gallons per day
I-5	Interstate Highway 5
LAFCO	Local Agency Formation Commission
lbs./day	Pounds per day
L_{dn}/CNEL	Day Night Average Sound Level / Community Noise Equivalent Level
L_{eq}	Equivalent Continuous Sound Level
LOS	Level of Service
mgd	Million gallons per day
MLD	Most Likely Descendant
MND	Mitigated Negative Declaration
MRZ	Mineral Resource Zones
MSL	Mean sea level
MTBA	Migratory Bird Treaty Act
NAHC	Native American Heritage Commission
NEIC	Northeastern Information Center
NESHAP	National Emission Standards for Hazardous Air Pollutants
ND	Negative Declaration
NPDES	National Pollutant Discharge Elimination System
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSVAB	Northern Sacramento Valley Air Basin
OEHHA	Office of Environmental Health Hazard Assessment
OHP	California Office of Historic Preservation
OPD	Orland Police Department
OPR	California Office of Planning and Research
O-S	Open Space (zoning)
OUSD	Orland Unified School District
OVFD	Orland Volunteer Fire Department
PM_{10} and $PM_{2.5}$	Particulate Matter
R-3	Residential Multiple Family Use
R-H	High Density Residential
R-L	Low Density Residential
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan

ACRONYMS AND ABBREVIATIONS

RWQCB	Regional Water Quality Control Board
USACE	United States Army Corps of Engineers
SCH	State Clearinghouse
SDWA	Safe Drinking Water Act
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act of 1975
SR	State Route
SRA	Sensitive Receptor Area
SSC	Species of special concern
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
UCMP	California Museum of Paleontology
USGS	United States Geological Service
USFWS	United States Fish and Wildlife Service

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1.0 BACKGROUND

1.1 Summary

Project Title:	Commerce Plaza Project
Lead Agency Name and Address:	City of Orland 815 Fourth Street Orland, CA 95963
Contact Person and Phone Number:	Scott Friend (530) 865-1608
Project Location:	• City of Orland, 4473 and 4483 Commerce Lane. • Assessor Parcel Number(s) (APN(s)): 045-170-041 and 045-170-042. • The site is located in Section 21, Township 22 North, and Range 3 West of the Mount Diablo Base and Meridian. The approximate center of the site is located at latitude 39°45'04" N and longitude 122°12'35" W. • The Proposed Project site is ±4.2 acres.
General Plan Designation:	*Commercial (C)*
Zoning:	Current: *O-S - Open Space* Requested: *C-H - Highway Service Commercial*

1.2 Introduction

The City of Orland is the Lead Agency for this Initial Study. The Initial Study has been prepared to identify and assess the anticipated environmental impacts of the Commerce Lane Plaza Project (Project or Proposed Project). This document has been prepared to satisfy the California Environmental Quality Act (CEQA) (Pub. Res. Code, Section 21000 *et seq.*) and State CEQA Guidelines (14 CCR 15000 *et seq.*). CEQA requires that all state and local government agencies consider the environmental consequences of Projects over which they have discretionary authority before acting on those Projects. A CEQA Initial Study is generally used to determine which CEQA document is appropriate for a Project (Negative Declaration [ND], Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]).

1.3 Project Location

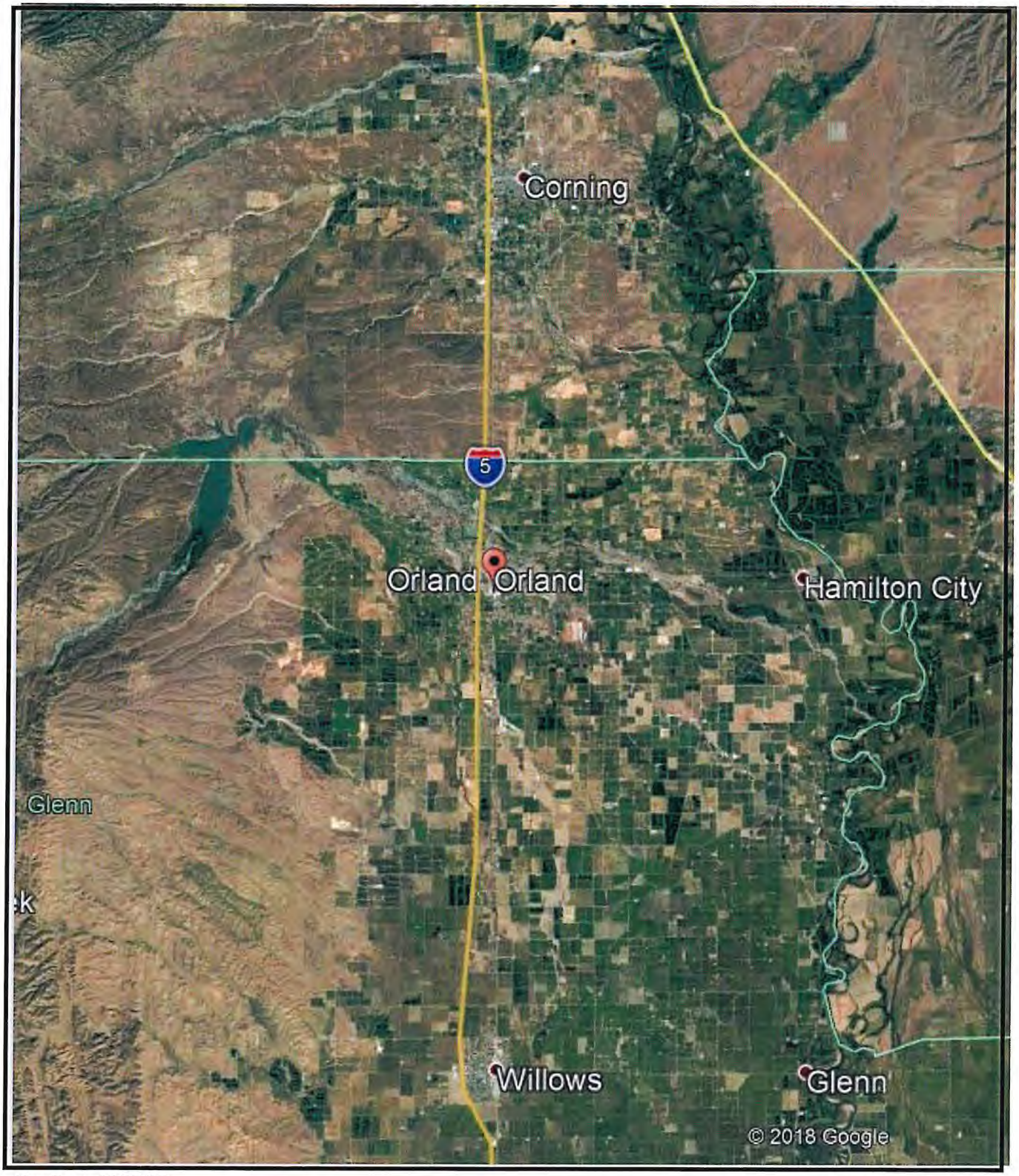
The Proposed Project is located on the westside of the City of Orland. As illustrated on the maps labeled **Figure 1. Project Vicinity** and **Figure 2. Project Location**, the ±4.2-acre Proposed Project site is located at 4473 and 4483 Commerce Lane in the City of Orland. The two parcels are currently vacant and not in

use. The Project site is located south of Newville Road and west of Commerce Lane (County Road HH), inside the City of Orland.

1.4 Surrounding Land Uses/Environmental Setting

Land uses surrounding the Proposed Project site include agriculture, commercial, and residential uses. Specifically, the Project site is bounded by Newville Road to the north with the commercial uses of a gas station, fast-food and sit-down restaurants, and offices beyond; the Pilot Flying J truck stop and Interstate 5 (I-5) are located to the east; Ide Road is located to the south with a single-family home, pastureland, and vacant land beyond; and low-density rural residential dwellings are located to the west, including agricultural uses. Northwest of the Project site, across Newville Road, is a mobile home park. Eagles Hall is located northwest of the Project site and to the west is an active orchard surrounding a rural single-family residential dwelling and a developed single-family dwelling set back from Newville Road. A hotel is proposed on the ±1.36-acre parcel directly adjacent to the southern border of parcel A and eastern border of parcel B.

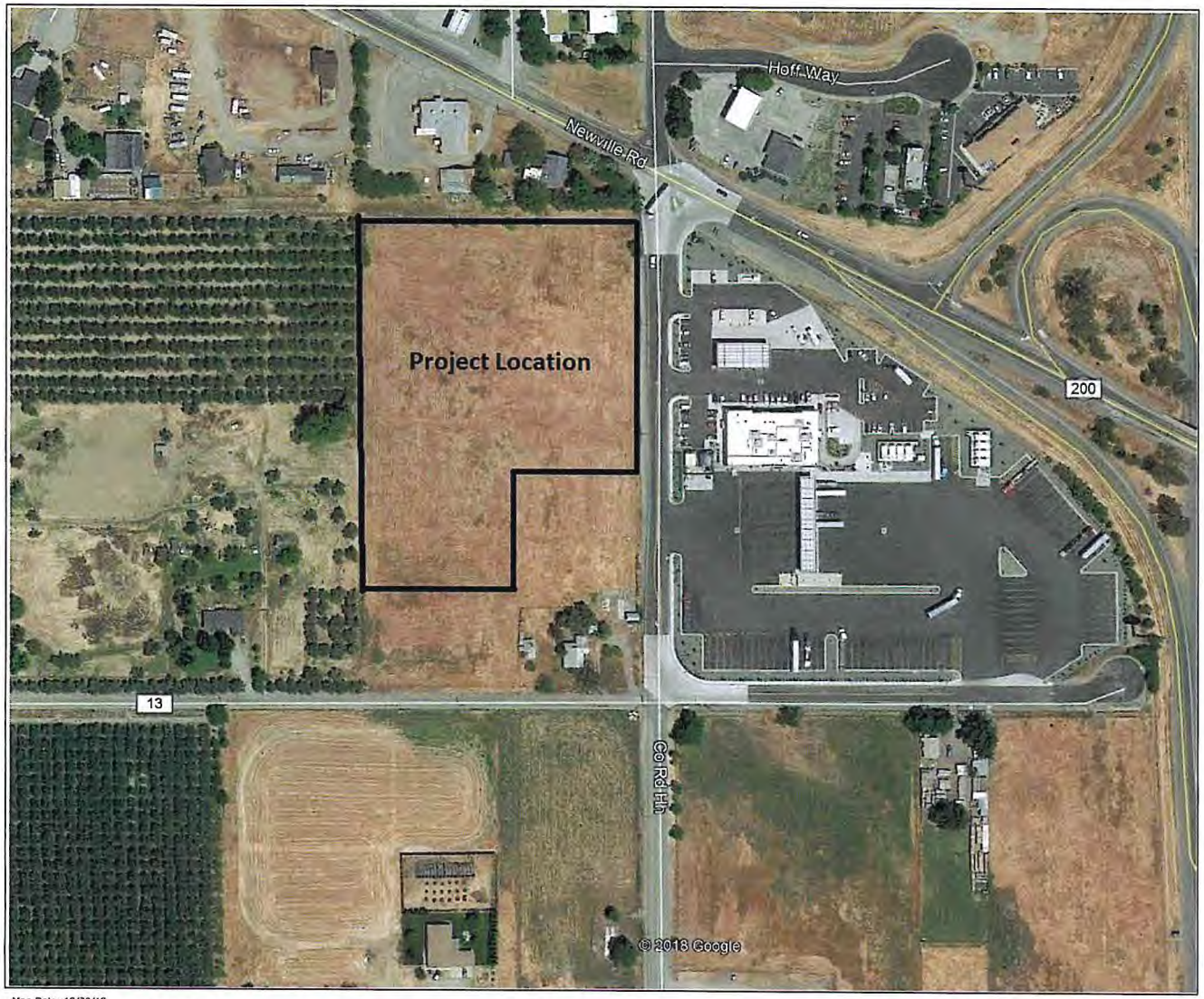
Those areas north of the Project site are within the Orland City Limits and the Local Agency Formation Commission (LAFCO)- approved Sphere of Influence and are zoned as *C-2 - Community Commercial* use and *R-3 - Residential Multiple Family* Use, and have the General Plan designations of *C - Commercial* and *R-H - High Density Residential.* The Pilot Flying J truck stop facility located to the east is zoned *C-H, Highway Service Commercial* and has the designation *C - Commercial.* Lands to the south and west of the Project site are in the unincorporated area of Glenn County and designated *R-L - Low Density Residential* and *R-H - High Density Residential* by the City General Plan. See **Figure 2. Project Location.**



Map Date: 10/30/19
Source: Google Earth 2019

Figure 1. Project Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



Map Date: *10/30/19*
Photo (or Base) Source: *Google Earth 2019*

Figure 2. Project Location

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

SECTION 2.0 PROJECT DESCRIPTION

2.1 Project Characteristics

Potential commercial development at the Project site may include a range of typical commercial uses. At this time, the Applicant has requested approval from the City of Orland for the following uses: two 2,000 sq. ft. restaurants and a 4,500 sq. ft. restaurant on parcel A and a 3,400 sq. ft. convenience store and restaurant with fueling bays and a car wash on parcel B (see **Figure 3. Conceptual Development Plan**). **Table 2.2-1** summarizes the proposed development components.

The Proposed Project is located on ±4.2 acres of land on two separate parcels (APNs 045-170-041 and 045-170-042). The two parcels are within the City of Orland. The topography of the site is flat with little elevation change, varying from approximately 265 feet above mean sea level (AMSL) over the ±4.2-acre site.

The Project site is within the City's *C - Commercial* General Plan land use designation and is currently zoned *O-S - Open Space*. The Project would rezone the parcels to *C-H - Highway Service Commercial* Use and the *C- Commercial Use* under the General Plan would remain. **Table 2.2-2** summarizes the proposed rezoning for the Project.

Table 2.2-1. Proposed Development Components

Parcel	Use	Square Footage
A	Restaurant	2,000 sq. ft.
	Restaurant	2,000 sq. ft.
	Restaurant	4,500 sq. ft.
B	Convenience Store & Restaurant	3,400 sq. ft.
	Fueling Bays	Unknown
	Car Wash	Unknown

Table 2.2-2. Proposed Rezone Designations

Parcel APN	Acreage (AC)	Current Zoning Designation	Proposed Zoning Designation
045-170-041	1.6	Open Space (O-S)	Highway Service Commercial (C-H)
045-170-042	2.6	Open Space (O-S)	Highway Service Commercial (C-H)

Existing Uses

The Project site is currently undeveloped. The site is currently covered in weeds and grasses which are managed by regular controlled burns. The Project site was previously utilized for organic strawberry cultivation.

Proposed Development

The Project applicant has requested approval from the City of Orland for the construction of a 3,400 sq. ft. convenience store with a restaurant located inside, with fueling bays and a car wash on parcel A. The applicant has requested three total restaurants on parcel B: two 2,000 sq. ft. restaurants and a 4,500 sq. ft. restaurant. The development types proposed by the applicant are consistent with the surrounding commercial developments.

Parcel A (APN 045-170-041):

The proposed development would include the following on parcel A: a 3,400 sq. ft. convenience store and restaurant with an associated car wash and an unspecified number of vehicle fueling bays. The parcel would be fully paved aside from a vegetative border surrounding the entirety of the ±1.6-acre parcel. The site would include approximately 14 parking spaces.

Parcel B (APN 045-170-042):

The proposed development would include the following on parcel B: a 2,000 sq. ft. restaurant at the north end, a 4,500 sq. ft. restaurant in the center of the parcel, on the western edge, and a 2,000 sq. ft. restaurant on the southern end. The ±2.6-acre parcel would be fully paved aside from a vegetative border surrounding the parcel and several trees located and vegetated areas located near proposed parking. The parcel would include approximately 115 parking spaces.

The center of the site would include a new ±245 ft. long driveway, Commerce Court, with a fountain and roundabout located in the center of the parcels. See **Figure 3. Conceptual Development Plan.**

The number of anticipated employees and the hours of operation are not yet known. For analysis purposes, a maximum buildout scenario of 50 employees and 24-hours a day, 7 day a week operation is assumed.

Map Date: *10/30/19*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 3. Conceptual Development Plan

2.2 Regulatory Requirements, Permits, and Approvals

The following approvals and regulatory permits would be required for implementation of the Proposed Project.

Lead Agency Approval

As the lead agency, the City of Orland has the ultimate authority for project approval or denial. The Proposed Project may require the following discretionary approvals and permits by the City for actions proposed as part of the Project:

- Certification of the Environmental Impact Report (EIR) or Mitigated Negative Declaration (MND)
- Approval of project site rezone to *C-H, Highway Service Commercial*
- Grading and building permits
- Site Plan approval
- Approval of Use Permit depending on final use
- Certification of the Environmental Impact Report

In addition to the above City actions, the Project may require approvals, permits, and entitlements from other public agencies for which this Initial Study may be used, including, without limitation, the following:

- California Department of Fish and Wildlife, Region 2
- California Department of Transportation, District 3
- Regional Water Quality Control Board, Central Valley Region (Region 5)
- Glenn County Air Pollution Control District
- State Water Resources Control Board

2.3 Relationship of Project to Other Plans and Projects

City of Orland General Plan

California state law requires cities and counties to prepare a general plan describing the location and types of desired land uses and other physical attributes in the city or county. General plans are required to address land use, circulation, housing, conservation, open space, noise, and safety. The Orland General Plan is the City's basic planning document and provides a comprehensive, long-term plan for physical development in the city. As previously stated, the City General Plan designates the Project site *C - Commercial.* The City established this designation to allow up to 60 percent building coverage and up to 100 percent coverage by parking/paved areas in the downtown area. This classification is intended to provide for a range of uses including retail stores, restaurants, professional and medical offices, large

office complexes, light manufacturing plants, outdoor recreation facilities, hotels, and many other uses involving the sale of a product or a service (City of Orland 2010a).

Zoning Ordinance

The Zoning Ordinance implements the policies of the General Plan by classifying and regulating the land uses and associated development standards in the City. The Project site currently within the City limits is zoned *O-S - Open Space*. However, approval of the Project by the City Council would result in the rezoning of the entire Project site to *C-H - Highway Service Commercial*.

SECTION 3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

3.1 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☒ Agriculture and Forestry resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Energy
☐ Geology and Soils	☒ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☒ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☒ Transportation	☒ Tribal Cultural Resources
☐ Utilities/ Service Systems	☐ Wildfire	☒ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

I find that although the Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared. ☐

I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☐

I find that the Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ☐

I find that although the Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Project, nothing further is required. ☐

Based on the preliminary environmental analysis performed prior to the completion of technical studies (besides traffic), the project MAY have a potentially significant impact on the environment. A Mitigated

Negative Declaration or an Environmental Impact Report will need to be prepared. A decision will be made following further deliberation.

Peter R. Carr
City Manager

Date

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4.0 ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

Scenic views available from the Project site include the Coast Range to the west, and on clear days the Cascade and Sierra Nevada mountains and foothills to the east and northeast. No state scenic highways pass through the vicinity.

Much of the land surrounding the project site is a combination of commercial development to the north, I-5 to the east, and rural development to the west and south. The project site and surrounding parcels are designated as *Commercial* in the Orland General Plan and either *Highway and Visitor Service Commercial, Service Commercial,* or *Suburban Residential* in the Glenn County General Plan. The project would be consistent with the Orland General Plan land use designation and the neighboring commercial uses that exist or have been approved (i.e. the Pilot Flying J, the SKP Ranch hotel and restaurant, and the Orland Sunny Truck Service Center).

Regional Setting

The City's General Plan Draft Environmental Impact Report (DEIR) (Orland 2010b) identifies views of the Coast Range and the Black Butte Recreation Area, Mount Lassen and the Cascade and Sierra mountains, and Stony Creek, as the most significant natural scenic resource within the Planning Area of the City. The General Plan does not include any policies for the protection of views or identify any viewsheds, or scenic vistas that should be protected.

State Scenic Highways

The intent of the California Scenic Highway Program is to protect and enhance the scenic beauty of California's highways and adjacent corridors. A highway can be designated as scenic based on how much natural beauty can be seen by users of the highway, the quality of the scenic landscape, and if development impacts the enjoyment of the view. No officially designated scenic highways are located within the vicinity of the Project site (Caltrans 2018).

Visual Character of the Project Site

The topography of the Project is flat, with an elevation of approximately 265 feet AMSL. The Project site is currently undeveloped and was previously utilized for organic strawberry cultivation. The site is not graded at present and is covered with annual grasses and weeds. The vegetation at the site is periodically managed.

Lighting

Individuals have a range of reactions to the perceived effects of lighting on the environment. As such, whether light is obtrusive is generally based on perception, but is also a function of the actual amount of light emitted from a source. The following are examples of light levels, expressed in foot-candles[1]:

- Direct sunlight - 10,000
- Full daylight - 1,000
- Twilight - 1
- Full moon - 0.1
- Covered parking lot - 5
- Gas station canopy - 12.5
- Department store - 40
- Grocery store – 50

Typical nighttime street lighting requirements are 1- to 3 foot-candles, which is generally considered to be unobtrusive. Glare created by sports-lighting systems can be measured for impairment of view. A typical example of glare effects is the car headlight. When viewed directly in front of a vehicle with the headlights on full beam, vision is impaired, resulting in disabling glare. However, when viewed from the side, the same headlights would not impair vision.

Spill Light—Spill light or light trespass is the light that illuminates surfaces beyond the property line. Typically, spill lighting is from a more horizontal source such as streetlights and way-finding/security lighting than sky glow, which emanates from a more vertical source into the atmosphere. Spill light can be accurately calculated and the effects of spill light can be measured for general understanding and comparison. However, light that is considered to be obtrusive is a subject of debate. A spill light impact is generally considered significant if the increase in spill lighting would exceed one foot-candle at the property line of the nearest sensitive receptor, sky glow is perceptibly increased, or glare is at a level such that it impairs vision.

Sky Glow—Sky glow is the light that illuminates the sky above the horizon and reflects off moisture and other tiny particles in the atmosphere. Sky glow would be considered a significant impact if it were a permanent addition to the environment. Additionally, in the case of the Proposed Project, a significant impact could occur if the proposed field lighting were uncontrolled and would significantly increase sky

[1] Foot-candle (fc): A unit of measure of the intensity of light falling on a surface, equal to one lumen per square foot and originally defined with reference to a standardized candle burning at one foot from a given surface. One fc = 0.01609696 watts. Source of examples: Source: Engineering Toolbox, n.d.

glow. Control features are available on the light sources to reduce sky glow and glare from nighttime lighting. These control features direct light downward, thereby reducing the spill of light that causes sky glow and reducing glare.

Glare—Glare can be described as direct or reflected light, which can then result in discomfort or disability. A well-designed lighting system controls light to provide maximum useful on-field illumination with minimal destructive offsite glare.

4.1.2 Aesthetics (I) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒

While the City's General Plan DEIR identifies views of the Coast Range and the Black Butte Recreation Area, Mount Lassen and the Cascade and Sierra mountains, and Stony Creek as the most significant natural scenic resource within the Planning Area of the City, the General Plan does not include any policies for the protection of views or identify any viewsheds, or scenic vistas that should be protected.

The Orland General Plan does not identify any areas considered to be scenic vistas that need to be protected and preserved in the City. Additionally, the Project site is not considered to be in an area of significant visual qualities, nor do these areas have any significant visual features. Therefore, The Proposed Project would have **no impact** on scenic vistas.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

The Proposed Project is not located within the vicinity of an officially designated scenic highway. Further, due to the lack of scenic resources on the project site, the Proposed Project would have no impact on scenic resources. **No impact** would occur.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	in a non-urbanized area substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐

With full implementation of the Proposed Project, the visual character of the ±4.2-acre site would change from undeveloped open space to commercial use with up to 60 percent building coverage.

The Project site is located in the western portion of the City and is bound by a combination of residential development to the north, the commercial Pilot Flying J development and I-5 to the east, an approved hotel and restaurant and a proposed truck service center to the south, and rural development to the west. A hotel is proposed on the ±1.36-acre parcel directly adjacent to the southern border of parcel A and eastern border of parcel B.

The Project site has a General Plan Designation of *C - Commercial.* Surrounding parcels to the north, east and south are designated for commercial use in the Orland General Plan and either zoned as *C-2 - Community Commercial* or *C-H - Highway Service Commercial.* Parcels to the west are designated as *Suburban Residential* in the Glenn County General Plan.

Despite the required zoning change from *O-S - Open Space* to *C-H - Highway Service Commercial*, the Project site would be consistent with existing and proposed land uses to the north, east, and south. Additionally, the Project would be consistent with the General Plan Designation for the two parcels. Thus, the Proposed Project would have a **less than significant** impact to the existing visual character of the area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Construction Lighting

No new light or glare sources visible beyond the Project site would be introduced during construction of the Proposed Project. All construction work will be performed during normal daylight construction hours, thereby eliminating any need for temporary light sources necessary for nighttime work. Specifically, Policy 6.1.J of the City of Orland General Plan construction activities shall be limited to the hours of 7 a.m. to

5 p.m. unless an exemption is received from the City to cover special circumstances (2010a). As the Project site is adjacent to Glenn County, Chapter 15.560.100 of Glenn County's Municipal Code exempts construction noise as long as it takes place between 7:00 a.m. and 7:00 p.m. (Glenn County 1993).

Due to the fact that construction of the Proposed Project will be occurring in the City of Orland, the City's standard is the most applicable to this analysis. Thus, construction would be limited to between the hours of 7:00 a.m. to 5:00 p.m. and construction of the Proposed Project would not create a substantial source of light glare which would adversely affect nighttime views.

Project Operational Lighting and Glare

The Proposed Project may result in a moderate increase of artificial light and glare into the existing environment. Potential sources of light and glare include external building lighting, parking lot lighting, security lighting, building windows, and reflective building materials. The introduction of new sources of light and glare may contribute to nighttime light pollution and result in impacts to nighttime views in the area.

All development of the Proposed Project would be subject to Orland Municipal Code Section 17.44.110, which requires the shielding of lighting to prevent illumination of the adjacent properties and to prevent glare or direct illumination of public streets, highways, and Interstate 5 (I-5), limits the height of light poles to the height of the main building, and requires suitable lights to properly illuminate any parking area (Orland 2019a).

Therefore, the Proposed Project would have a **less than significant** impact on aesthetics.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The California Department of Conservation (DOC) manages the Farmland Mapping and Monitoring Program (FMMP), which identifies and maps significant farmland. Farmland is classified using a system of five categories including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. The classification of farmland as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance is based on the suitability of soils for agricultural production, as determined by a soil survey conducted by the Natural Resources Conservation Service (NRCS).

According to the California Department of Conservation (DOC), Glenn County had 576,502 acres of agricultural land in 2006, 161,683 acres of which were considered Prime Farmland. Prime Farmland is defined as land with the best combination of physical and chemical features able to sustain the long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields. By 2016, acreage of agricultural land in Glenn County had increased slightly to 574,733 acres. However, Prime Farmland had decreased to 158,117 acres, a loss of 3,566 acres. Farmland of Statewide Importance, Unique, and Farmland of Local Importance all had during the same time period resulting in a net gain in agricultural land of 341 acres (DOC 2015, 2016a).

The DOC identifies the Project site as containing Farmland of Statewide Importance, Unique Farmland, and Prime Farmland (DOC 2019). The site is not subject to a Williamson Act contract (DOC 2016b). Approximately seven years ago, the Project site was utilized for organic strawberry cultivation but is currently not in use. The Project site contains no forest or timber resources, is not zoned for forestland protection or timber production. The entirety of the Project would occur on the existing ±4.2-acre site. See **Figure 4. Farmland Designations**.

Farmland Classification and Rating System

The Farmland Mapping and Monitoring Program (FMMP), administered by the DOC, maps agricultural areas based on soil quality and land use. Land use categories include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. More information about these classifications is provided below.

Farmland Mapping and Monitoring Program

The FMMP was established in 1982 to continue farmland mapping efforts begun in 1975 by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The USDA's intent was to produce agricultural resource maps based on soil quality and land use across the nation. As part of the nationwide agricultural land use mapping effort, the USDA developed a series of definitions known as Land Inventory and Monitoring (LIM) criteria, which classified land's suitability for agricultural production. Suitability included both the physical and chemical characteristics of soils and the actual land use. Important Farmland Maps are derived from the USDA soil survey maps using the LIM criteria. Important Farmland Maps for California are compiled using the modified LIM criteria. The minimum mapping unit is 10 acres unless otherwise specified. Units of land smaller than 10 acres are incorporated into the surrounding classification. The Important Farmland Maps identify five agriculture-related categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land.

Storie Index Rating System

An additional method to determining farmland in California is the California Revised Storie Index. The Storie Index Rating System ranks soil characteristics according to their suitability for agriculture. Ratings range from Grade 1 soils (80 to 100 rating), which have few or no limitations for agricultural production, to Grade 6 soils (less than 10), which are not suitable for agriculture. Under this system, soils deemed less than prime can function as prime soils when limitations such as poor drainage, slopes, or soil nutrient deficiencies are partially or entirely removed. The Storie Index assesses the productivity of a soil from the following four characteristics: Factor A, degree of soil profile development; Factor B, texture of the surface layer; Factor C, slope; and Factor X, manageable features, including drainage, microrelief, fertility, acidity, erosion, and salt content. A score ranging from 0 to 100 percent is determined for each factor, and the scores are then multiplied together to derive an index rating (NRCS 1992).

As shown in **Table 4.2-1**, according to the USDA NRCS (2019), approximately 50 percent of the Project site is comprised of Cortina very gravelly sandy loam, shallow. This soil is considered to be Grade 4- Poor on the Storie Index.

Table 4.2-1. Project Soil Storie Index

Soil Map Unit	Soil	Acreage	Approximate Percentage of Site	Storie Index
Czk	Cortina very gravelly sandy loam, shallow	1.7	40.5%	Grade 4- Poor
Wg	Wyo loam, deep over gravel	0.7	16.7%	Grade 1- Excellent
Wh	Wyo gravelly loam, moderately deep over gravel	1.8	42.9%	Grade 4- Poor
	Total Acreage:	**4.2**		

Source: NCRS 2019
Note: This rating considers the land vacant and therefore is difference than the DOC farmland identification system which identifies developed lands and result in different acreages.

4.2.2 Regulatory Setting

Federal

Natural Resources Conservation Service

Farmland Protection Policy Act: The NRCS, a federal agency within the USDA, is the primary agency responsible for implementation of the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize federal programs' contribution to the conversion of farmland to nonagricultural uses by ensuring federal programs are administered in a manner that is compatible with state, local, and private programs designed to protect farmland. The NRCS provides technical assistance to federal agencies, state and local governments, tribes, or nonprofit organizations that desire to develop farmland protection programs and policies.

State

California Department of Conservation

The DOC administers and supports a number of programs, including the FMMP, the California Agriculture Land Evaluation and Site Assessment Model (LESA), and the Williamson Act. These programs are designed to preserve agricultural land and provide data on the conversion of agricultural land to urban use (DOC 2019b).

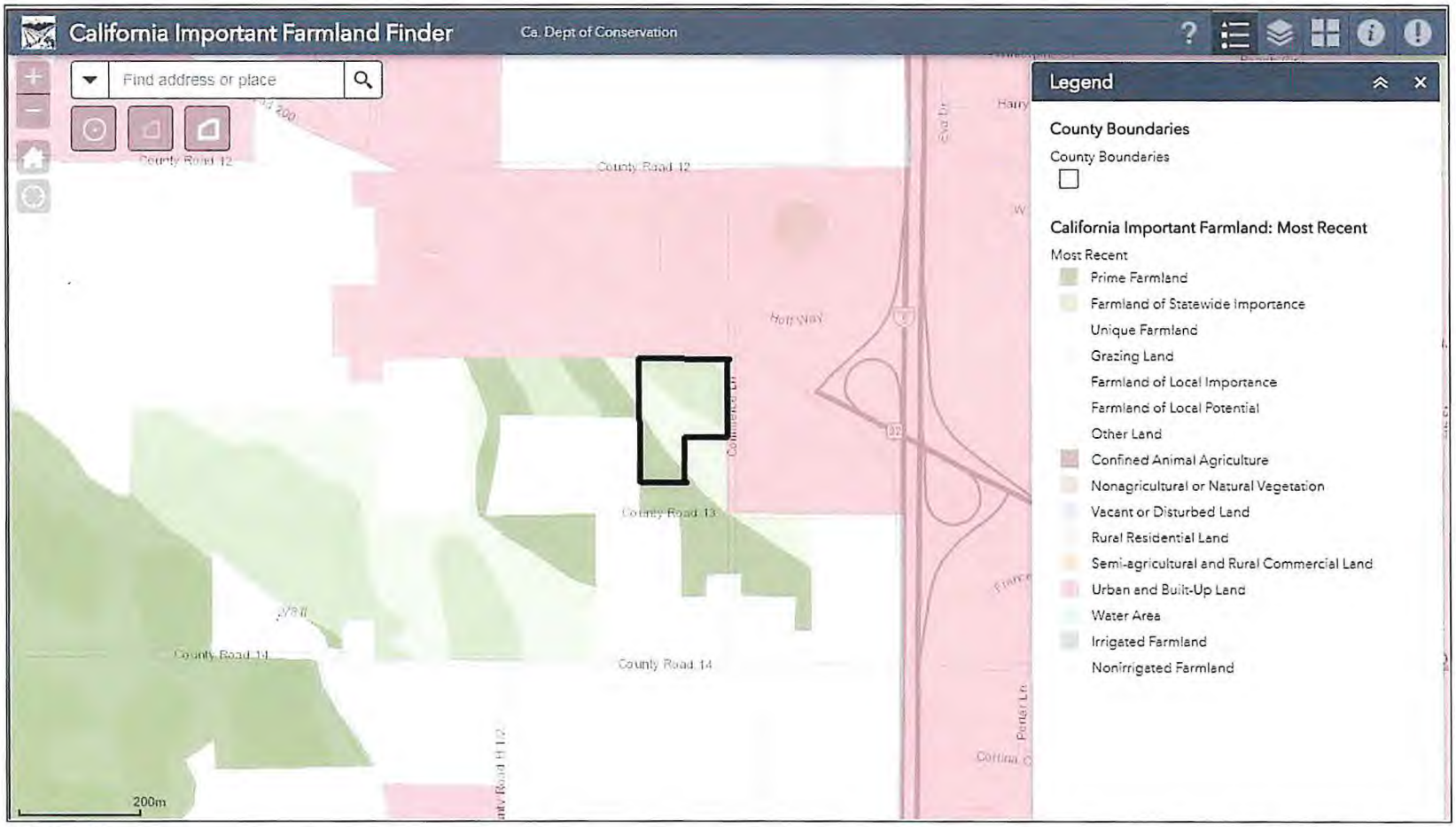
Farmland Mapping and Monitoring Program: The Important Farmland Inventory System initiated in 1975 by the USDA NRCS classifies land based on ten soil and climatic characteristics. The DOC started a similar system of mapping and monitoring for California in 1980, known as the FMMP.

Under the CEQA, the lead agency is required to evaluate agricultural resources in environmental assessments at least in part based on the FMMP. The state's system was designed to document how much agricultural land in California was being converted to nonagricultural land or transferred into Williamson Act contracts. The definitions of Important Farmland types are provided in the FMMP discussion in the Environmental Setting subsection above.

California Agriculture Land Evaluation and Site Assessment (LESA) Model: The California Agriculture LESA model was developed in 1997 based on the federal LESA system. It can be used to rank the relative importance of farmland and the potential significance of its conversion on a site-by-site basis. The California LESA model considers the following factors: land capability, Storie Index, water availability (drought and non-drought conditions), land uses within 1/4 mile, and protected resource lands (e.g., Williamson Act lands) surrounding the property. A score can be derived and used to determine if the conversion of a property would be significant. Under CEQA, lead agencies may refer to the LESA model in their environmental analysis but are not required to do so.

Williamson Act

The Williamson Act (California Land Conservation Act of 1965) enables local governments to enter into contracts with private land owners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, land owners receive property tax assessments which are lower than full market value of the property because they are based on farming and open space uses.



Map Date: *10/30/19*
Photo (or Base) Source: *DOC 2019*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4. Farmland Designations

4.2.3 *Agriculture and Forestry Resources (II) Environmental Checklist and Discussion*

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☒	☐	☐	☐

The DOC (2019) identifies the Project site as being composed of Farmland of Statewide Importance, Unique Farmland, and Prime Farmland. The Web Soil Survey, managed by the Natural Resource Conservation Service (NRCS) (2019), identifies the following soil types within the Project area: Cortina very gravelly sandy loam, shallow (Czk), Wyo loam, deep over gravel (Wg), and Wyo gravelly loam, moderately deep over gravel (Wh).

The entirety of the ±4.2- acre Project site is composed of Important Farmland. The significance of the impact is dependent in large part on the quantity and quality of the farmland. When considering the potentially significant impact, a few main aspects should be considered. First, the Project site has not been utilized for farming for seven or more years. Secondly, the site is a mere ±4.2 acres, a small size for farming, and is surrounded by existing and approved commercial and residential development. Furthermore, the Project site has a General Plan designation of *C - Commercial* and is undergoing a rezoning request to be zoned as *C-H - Highway Service Commercial*. The site is currently zoned *O-S - Open Space* but is not being utilized as a park or related uses; the site is vacant and unused at present. As such, the Project will have a **potentially significant impact** regarding conversion of Important Farmland. The potential impact to agricultural land should be evaluate in the subsequent environmental analysis.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

This site is not subject to a Williamson Act contract, and the site is not zoned for agricultural use in the City of Orland General Plan. There are no Williamson Act contract lands within the vicinity of the Project site (DOC 2016b). The Project would have **no impact** in this area.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒

No forest lands exist on the Project site or within the vicinity of the Project. The Project would have **no impact** in this area.

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

No forest lands exist on the Project site or within the vicinity of the Project. The Project would have **no impact** in this area.

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

The Project proposes the rezoning of *O-S - Open Space* land to *C-H - Highway Service Commercial* use to allow for the construction of commercial building(s) on the vacant lot. There are agricultural uses located directly to the west of the Project site within Glenn County that are identified as *Suburban Residential* in the Glenn County General Plan. However, the Project is consistent with existing and proposed commercial uses to the east and south.

In instances where a residential project is to be constructed in the vicinity of agricultural use, there is potential for resident/agricultural conflicts because of pesticide/herbicide use and noise. These conflicts could result in the conversion of agricultural land to nonagricultural use. However, the Project will consist of commercial uses (i.e. a fast food joints, gas station, etc.). Thus, no future resident concerns about adjacent agricultural practices would occur. Finally, the area is developed with a variety of uses ranging from agricultural to commercial to residential to industrial. Commercial development would not be out of

character for the area. Urban type infrastructure, such as water, sewer, electricity, and roadways are all readily available in the immediate area. The Proposed Project would not result in the extension of infrastructure as it already exists besides to allow direct connection of the Project to infrastructure. Therefore, development of the Project would not result in future un-planned growth which may impact agricultural uses in the area.

Based on the information provided above, the Project has a **less than significant** impact in regard to causing changes in the existing environment, which due to its location in nature, may result in the conversion of farmland to nonagricultural use.

4.3 Air Quality

4.3.1 Environmental Setting

The Proposed Project is located in Glenn County, which is in the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB consists of a total of seven counties: Sutter, Yuba, Colusa, Butte, Glenn, Tehama, and Shasta. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada range. These mountain ranges reach heights in excess of 6,000 feet above sea level, with individual peaks rising much higher. The mountains form a substantial physical barrier to locally created pollution as well as that transported northward on prevailing winds from the Sacramento metropolitan area.

Both the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The six criteria pollutants are ozone, carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NOx), sulfur dioxide (SO_2), and lead. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Glenn County has been designated an attainment or unclassified (data insufficient to support any designation) area for all federal ambient air quality standards (CARB 2017). However, the county is designated a nonattainment area for state particulate matter less than 10 microns (PM_{10}) standards (CARB 2017). The County is designated an attainment or unclassified area for all other state ambient air quality standards (CARB 2017).

The regional air quality regulating authority is the GCAPCD, which monitors air quality in the County and serves as the lead agency responsible for implementing and enforcing federal, state, and County air quality regulations. Air pollution sources in the county include seasonal burning of agricultural fields, dust from agricultural operations, and motor vehicle emissions.

4.3.2 *Air Quality (III) Environmental Checklist and Discussion*

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the CCAA requires an air quality attainment plan (AQAP) to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The North Sacramento Valley Planning Area (NSVPA) 2015 Air Quality Attainment Plan is the most recent air quality planning document covering Glenn County. SIPs are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, and permitting), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards for ozone and particulate matter. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts prepare SIP elements and submit them to CARB for review and approval. The NSVPA 2015 AQAP includes forecast ROGs and NO_x emissions (ozone precursors) for the entire NSVPA region through the year 2020. These emissions are not appropriated by county or municipality.

Criteria for determining consistency with the 2015 AQAP are defined by the following indicators:

- *Consistency Criterion No. 1*: The Proposed Project would not result in an increase in the frequency or severity of existing air quality violations, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQAP.
- *Consistency Criterion No. 2*: The Proposed Project would not exceed the assumptions in the AQAP.

The violations to which Consistency Criterion No. 1 refers are the California ambient air quality standards and the national ambient air quality standards. As evaluated under Impact b) below, the Project would not exceed the short-term construction standards or long-term operational standards and in so doing would not violate any air quality standards. Thus, a **less than significant** impact is expected, and the Project would be consistent with the first criterion.

Concerning Consistency Criterion No. 2, the AQAP contains air pollutant reduction strategies and demonstrates that the applicable ambient air quality standards can be achieved within the time frames required under federal law. Growth projections from local general plans adopted by cities in the district are used to develop regional growth forecasts that are used to develop future air quality forecasts for the

NSVPA 2015 Air Quality Attainment Plan. Development consistent with the growth projections in the City of Orland General Plan is considered to be consistent with the 2015 AQAP.

The Project site is within the City's *C - Commercial* General Plan land use designation and is currently zoned *O-S - Open Space* by the City. The Project is consistent with the General Plan Land Use designation but requires a rezone to change the *O-S* zoning designation to *C-H - Highway Service Commercial.* Therefore, the Project is consistent with the City General Plans designation and thus is consistent with the regional growth anticipated by the AQAP. Further, as discussed under Impact b), below, construction and operation emissions for particulate matter would not exceed the SMAQMD thresholds. As a result, the Project would not result in violations or affect air quality attainment status. The Project would not hinder implementation of any NSVPA Air Quality Attainment Plan control measures. A **less than significant impact** would occur.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☒	☐	☐	☐

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulative considerable.

Because Project specifics are not available at this time, analysis of the Project's air quality emissions cannot be completed. As such, the Proposed Project could result in the emission of criteria air pollutants during construction and operation. Since an air quality analysis has not yet been completed for the Proposed Project, it is not possible to determine the impact the Project would have on any criteria pollutant. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. The CARB

has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. Sensitive receptors closest to the Project site include a residences located as close as 50 feet from the Project site and several other residences located just over 200 feet from the Project site.

The Proposed Project could result in the emission of criteria air pollutants during construction and operation. Since an air quality analysis has not yet been completed for the Proposed Project, it is not possible to determine the impact the Project would have on sensitive receptors. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

The Proposed Project could result in emissions causing unpleasant odors during construction and operation. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

4.4 Biological Resources

4.4.1 Environmental Setting

The US Fish and Wildlife Service (USFWS), CDFW, and California Native Plant Society (CNPS) document species that may be rare, threatened, or endangered. Federally listed species are fully protected under the mandates of the federal Endangered Species Act (ESA). "Take" of listed species incidental to otherwise

lawful activity may be authorized by either the USFWS or the National Marine Fisheries Service (NMFS), depending on the species.

Under the California Endangered Species Act (CESA), the CDFW has the responsibility for maintaining a list of threatened and endangered species. The CDFW also maintains lists of "candidate species" and "species of special concern," which serve as "watch lists." State-listed species are fully protected under the mandates of the CESA. Take of protected species incidental to otherwise lawful management activities may be authorized under Section 2081 of the California Fish and Game Code.

Under Section 3503.5 of the California Fish and Game Code, it is unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (raptors) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.

The Native Plant Protection Act (California Fish and Game Code Sections 1900-1913) prohibits the take, possession, or sale within the state of any rare, threatened, or endangered plants as defined by the CDFW. Project impacts on these species would not be considered significant unless the species are known to have a high potential to occur within the area of disturbance associated with the project.

4.4.2 Biological Resources (IV) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	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 Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐

The Project site has not yet been evaluated for the potential to affect candidate, sensitive, or special status species. As such, the project would have a **potentially significant impact** in this area and biological analysis will occur as a part of the subsequent environmental document prepared for this Project.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	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 California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒

No creeks, streams, or rivers exist on the Project site. No riparian habitats or other sensitive natural communities identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) have been identified on the Project site. The Project would have **no impact** in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Have a substantial adverse effect on state or federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐

The Project site has not yet been evaluated for the potential to affect wetlands. As such, the project would have a **potentially significant impact** in this area and a wetlands delineation and analysis will occur as a part of the subsequent environmental document prepared for this Project.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒

The Project site is surrounded by existing development areas and roadways. There are no nearby areas with native habitat that can support large concentrations of wildlife. Therefore, the Project site does not function as a wildlife corridor. The Project contains no waterways and thus would not impact the migration of fish. Regular vegetation control (controlled burns) is completed on the site the site is and devoid of trees, shrubs, and buildings. Thus, the Project would have no impact on native wildlife nursery sites. The Project would have **no impact** in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

There are currently no adopted or proposed local policies or ordinances that affect the Proposed Project. Therefore, **no impact** would occur.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

There are no adopted habitat conservation plans, natural community conservation plans, or any adopted biological resources recovery or conservation plans in the Proposed Project area. As such, **no impact** would occur.

4.5 Cultural Resources

4.5.1 Environmental Setting

The Project area is located within what is historically documented as Central Wintun (Nomlaki) territory. There were two major divisions of Nomlaki Indians in California: the Hill Nomlaki and the River Nomlaki. The Hill Nomlaki are identified as the Paskenta Band of Nomlaki Indians. It is this group that has ancestral ties to the Orland area, which includes the Project area. Euro-American contact with Native American groups living in the Central Valley of California began during the last half of the eighteenth century. At this time, the attention of Spanish missionaries shifted away from the coast, and its dwindling Native American population, to the conversion and missionization of interior populations.

Following Euro-American contact, the land was bought to farm; the advent of a canal system and a railroad hub nearby made the land particularly attractive. The population of California was growing and food producers were needed. The Orland area was particularly suited for fruit and nut trees. At the turn of the previous century, alfalfa, sugar beets, and grains were the more common crops produced in the irrigated fields in the area.

4.5.3 Cultural Resources (V) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐

A cultural resources survey has not been completed for the Project site. As such, there is a potential for the Project to impact historical resources on the on the site. The extent of this potential impact has not been determined at this time. As such, this is a **potentially significant impact** that will be discussed in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐

A cultural resources survey has not been completed for the Project site. As such, there is a potential for the Project to impact archaeological resources on the on the site. The extent of this potential impact has not been determined at this time. As such, this is a **potentially significant impact** that will be discussed in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☒	☐	☐	☐

A cultural resources survey has not been completed for the Project site. As such, there is a potential for the Project to impact any possible human remains on the on the site. The extent of this potential impact has not been determined at this time. As such, this is a **potentially significant impact** that will be discussed in the subsequent environmental document.

4.6 Energy

4.6.1 Environmental Setting

Energy consumption is analyzed in this Initial Study due to the potential direct and indirect environmental impacts associated with the Project. Such impacts include the depletion of nonrenewable resources (oil, natural gas, coal, etc.) during both the construction and long-term operational phases. The Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to the Project area. PG&E provides natural gas and electricity to most of the northern two-thirds of California, from Bakersfield and Barstow to near the Oregon, Nevada and Arizona State Line. It provides 5.2 million people with electricity and natural gas across 70,000 square miles.

Electricity use is measured in kilowatt-hours (kWh), and natural gas use is measured in therms. Vehicle fuel use is typically measured in gallons (e.g. of gasoline or diesel fuel), although energy use for electric vehicles is measured in kWh.

The electricity consumption associated with all non-residential uses in Glenn County from 2014 to 2018 is shown in **Table 4.6-1**. As indicated, the demand has increased since 2014.

Table 4.6-1. Non-Residential Electricity Consumption in Glenn County 2014-2018

Year	Non-Residential Electricity Consumption (kilowatt hours)
2018	310,292,800
2017	296,677,120
2016	276,414,306
2015	294,464,463
2014	291,473,564

Source: ECDMS 2019

The natural gas consumption associated with non-residential uses in Glenn County from 2014 to 2018 is shown in **Table 4.6-2**. As indicated, the demand has remained constant since 2014.

Table 4.6-2. Non-Residential Natural Gas Consumption in Glenn County 2014-2018

Year	Non-Residential Natural Gas Consumption (therms)
2018	5,790,626
2017	6,059,326
2016	5,838,224
2015	6,159,485
2014	5,767,873

Source: ECDMS 2019

Automotive fuel consumption in Glenn County from 2016 to 2020 (expected year for construction to begin) is shown in **Table 4.6-3**. As shown, on-road fuel consumption has decreased since 2016 and off-road fuel consumption has increased since 2016.

Table 4.6-3. Automotive Fuel Consumption in Glenn County 2016-2020

Year	Fuel Consumption (gallons)	
	On-Road	Off-Road
2020	30,143,162	1,295,086
2019	30,793,430	1,245,318
2018	31,422,301	1,193,503
2017	32,050,919	1,147,250
2016	32,344,134	1,102,925

Source: ECDMS 2019

4.6.2 *Energy (VI) Environmental Checklist and Discussion*

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☒	☐	☐	☐

The energy use impact analysis focuses on the three sources of energy that are relevant to the Proposed Project: electricity, the equipment fuels necessary for Project construction, and the automotive and diesel fuel used during Project operations. The amount of energy necessary to construct and operate the Project and whether or not it is a wasteful, inefficient, or unnecessary consumption of energy resources has not been determined and as such this is a **potentially significant impact** that will be analyzed in a subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

The City of Orland does not have a plan for renewable energy or energy efficiency. As discussed in under Item a), the amount of energy necessary to construct and operate the Project and whether or not it is a wasteful, inefficient, or unnecessary consumption of energy resources has not been determined. How this will affect a state plan for renewable energy or energy efficiency has also not been determined at this time. For these reasons, this is a **potentially significant impact** that will be analyzed in a subsequent environmental document.

4.7 Geology and Soils

4.7.1 *Environmental Setting*

Geomorphic Setting

The Project site is located in the north-central portion of the Great Valley geomorphic province of California. The Great Valley province is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River and its southern part is the San Joaquin Valley drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic Period (about 160 million years ago). Great oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor (CGS 2002).

Site Geology

According to the California Geological Survey (CGS, 1960), the Project site is underlain by what is termed Fan and Basin deposits, stratified deposits of gravel, sand, silt, clay, or other debris, moved by streams from higher to lower ground (USGS 2018a).

Site Soils

According to the NRCS Web Soil Survey website (NRCS 2019), three soil units, or types, have been mapped within the Project site as shown in **Table 4.7-1** below. These are: (CzT) Cortina very gravelly sandy loam, moderately deep, (Wg) Wyo loam, deep over gravel, and Wyo gravelly loam, moderately deep over gravel. Among many soil related attributes, the Web Soil Survey identifies drainage, flooding, erosion, runoff, and the linear extensibility potential for the Project soils. According to this survey, the Project is predominately underlain by soils that are somewhat excessively drained to well-drained and have a low to moderate runoff potential. The Project site soils have a slight erosion potential and a low linear extensibility (shrink-swell) (NRCS 2019).

Table 4.7-1. Project Soil Characteristics

Soil	Percent of Site	Drainage	Flooding Frequency Class	Erosion Hazard[1]	Runoff Potential[2]	Linear Extensibility[3]	Frost Action[4]
Cortina very gravelly sandy loam, shallow	40.5%	Somewhat excessively drained	Occasional	Slight	Very Low	1.5%	None
Wyo loam, deep over gravel	16.7%	Well drained	None	Slight	Low	1.5%	None
Wyo gravelly loam, moderately deep over gravel	42.9%	Well Drained	None	Slight	Low	1.5%	None

Source: NRCS 2019

Notes:

1. *The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and offsite damage are likely, and erosion-control measures are costly and generally impractical.*
2. *Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation. Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. Group B. Soils having a moderate infiltration rate when thoroughly wet. Group C. Soils having a slow infiltration rate when thoroughly wet. Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.*
3. *Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.*
4. *Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing*

Regional Seismicity and Fault Zones

In California, special definitions for active faults were devised to implement the Alquist-Priolo Earthquake Fault Zoning Act of 1972, which regulates development and construction in order to avoid the hazard of surface fault rupture. The State Mining and Geology Board established policies and criteria in accordance with the act. The Board defined an active fault as one which has had surface displacement within

Holocene time (about the last 11,000 years). A potentially active fault was considered to be any fault that showed evidence of surface displacement during Quaternary time (last 1.6 million years). Because of the large number of potentially active faults in California, the State Geologist adopted additional definitions and criteria to limit zoning to only those faults with a relatively high potential for surface rupture. Thus, the term "sufficiently active" was defined as a fault for which there was evidence of Holocene surface displacement. This term was used in conjunction with the term "well-defined," which relates to the ability to locate a Holocene fault as a surface or near-surface feature (CGS 2010).

According to the Orland General Plan Update EIR (2010b), the primary seismic hazard associated with the Orland planning area is minor ground shaking. The planning area is not located within an Alquist-Priolo earthquake hazard zone. The closest active fault system is the 40-mile-long Willows fault, located about 10 miles west of the City.

Paleontological Resources

A paleontological records search has not yet been requested from the University of California Museum of Paleontology (UCMP).

4.7.2 *Geology and Soils (VI) Environmental Checklist and Discussion*

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒

i) The Proposed Project site is not located within an Alquist-Priolo Earthquake Zone (CGS 2010, 2015). There would be **no impact** related to fault rupture.

ii) According to CGS's Earthquake Shaking Potential for California mapping, the Proposed Project site is located in an area which is distant from known, active faults and will experience lower levels of groundshaking less frequently. In most earthquakes, only weaker masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking in the area (CGS 2016). The Proposed Project will include the construction of commercial building(s), which may be affected by a seismic event. However, all structures would be required to comply with the 2016 California Building Code and the City of Orland Improvement Standards, including any required seismic mitigation standards. Because of the required compliance and the distance from active faults, the Proposed Project would have a **less than significant** impact related to strong ground shaking.

iii) Liquefaction occurs when loose sand and silt that is saturated with water behaves like a liquid when shaken by an earthquake. Liquefaction can result in the following types of seismic-related ground failure:

- Loss of bearing strength – soils liquefy and lose the ability to support structures
- Lateral spreading – soils slide down gentle slopes or toward stream banks
- Flow failures – soils move down steep slopes with large displacement
- Ground oscillation – surface soils, riding on a buried liquefied layer, are thrown back and forth by shaking

- Flotation – floating of light buried structures to the surface
- Settlement – settling of ground surface as soils reconsolidate
- Subsidence – compaction of soil and sediment

Three factors are required for liquefaction to occur: (1) loose, granular sediment; (2) saturation of the sediment by groundwater; and (3) strong shaking. Because the Proposed Project site is located in an area determined to have a low chance of seismic hazard and all projects in Orland are required to comply with the seismic building standards of the California Building Code and City of Orland Improvement Standards, the potential for impacts resulting from liquefaction is considered **less than significant**.

iv) The project site has flat topography, indicating no potential for landslides. As such, the Proposed Project would have **no impact** in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

As shown in **Table 4.7-1**, the Project soils have a slight to moderate erosion potential. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions.

Future grading and site preparation activities associated with Project development would remove topsoil on the vacant parcel, disturbing and potentially exposing the underlying soils to erosion from a variety of sources, including wind and water. However, the Project site is flat, which would reduce the potential for substantial erosion. Because construction and the resulting potential erosion may affect water quality, any development involving clearing, grading, or excavation that causes soil disturbance on one or more acres is subject to a National Pollutant Discharge Elimination System (NPDES) General Construction Stormwater Permit. The Proposed Project would also be required to prepare and comply with an approved stormwater pollution prevention plan. The flat topography of the site and compliance with this requirement would reduce potential erosion impacts to a **less than significant** level.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) 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?	☐	☐	☒	☐

As discussed previously, the Project site has no potential for landslides due to the flat topography of the site.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other "free" face, such as an excavation boundary. Lateral spreading can result from either the slump of low cohesion and unconsolidated material or, more commonly, by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope, resulting in gravitationally driven movement. One indicator of potential lateral expansion is frost action. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing (NRCS 2019). As indicated in **Table 4.7-1**, the Web Soil Survey identifies the Project site as having soils with no frost action potential. As such, the potential for impacts due to lateral spreading would be less than significant.

With the withdrawal of fluids, the pore spaces within the soils decrease, leading to a volumetric reduction. If that reduction is significant enough over an appropriately thick sequence of sediments, then regional ground subsidence can occur. This typically only occurs within poorly lithified sediments and not within competent rock.[2] No oil, gas, or high-volume water extraction wells are known to be present in the Project area. According to the United States Geological Service (USGS), the Project site is not located in an area of land subsidence (USGS 2018b). As such, the potential for impacts due to subsidence would be less than significant.

Collapse occurs when water is introduced to poorly cemented soils, resulting in the dissolution of the soil cementation and the volumetric collapse of the soil. In most cases, the soils are cemented with weak clay (argillic) sediments or soluble precipitates. This phenomenon generally occurs in granular sediments situated within arid environments. Collapsible soils will settle without any additional applied pressure when sufficient water becomes available to the soil. Water weakens or destroys bonding material between particles that can severely reduce the bearing capacity of the original soil. The collapse potential of these soils must be determined for consideration in the foundation design.

The City has adopted the 2016 California Building Code. The California Building Code includes common engineering practices requiring special design and construction methods that reduce or eliminate potential soil-related impacts. As such, the potential for impacts due to collapse would be less than significant.

Overall, the Project would have a **less than significant** impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994),	☐	☐	☒	☐

[2] The processes by which loose sediment is hardened to rock are collectively called lithification.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
creating substantial direct or indirect risks to life or property?				

Expansive soils are types of soil that shrink or swell as the moisture content decreases or increases. Structures built on these soils may experience shifting, cracking, and breaking damage as soils shrink and subside or expand. Expansive soils can be determined by a soil's linear extensibility. There is a direct relationship between linear extensibility of a soil and the potential for expansive behavior, with expansive soil generally having a high linear extensibility. Thus, granular soils typically have a low potential to be expansive, whereas clay-rich soils can have a low to high potential to be expansive.

According to the NRCS, linear extensibility values for the site are about 1.5 percent. Soils with linear extensibility of 1.5% have a low expansion potential, as noted in **Table 4.7-1**. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. As shown in **Table 4.7-1**, 100 percent of the Project site soils have a low shrink-swell potential. As such, the Project would have a **less than significant** impact in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

The Project would connect to the City of Orland's wastewater collection and treatment plant. The Proposed Project would not use a septic system or other wastewater disposal system. Thus, the Project would have **no impact** in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

A search of the UCMP has not been performed to determine the presence of known paleontological resources in the Project area. Although paleontological resources sites are known to have previously been identified in the Project area, there is a possibility that unanticipated paleontological resources will be encountered during ground-disturbing, Project-related activities. As such, this is a **potentially significant impact** that will be discussed in the EIR.

4.8 Greenhouse Gas Emissions

4.8.1 Environmental Setting

Greenhouse gases (GHGs) are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons, creates a blanket around the earth that allows light to pass through but traps heat at the surface, preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps approximately 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

4.8.2 *Greenhouse Gas Emissions (VII) Environmental Checklist and Discussion*

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐

A greenhouse gas emissions analysis has not yet been completed for the Project. As such, the Proposed Project could result in the emission of greenhouse gases during construction and operation which acceptable thresholds. Since a greenhouse gas analysis has not yet been completed for the Proposed Project, it is not possible to determine the impact the Project would have on greenhouse gas and climate change. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

A greenhouse gas emissions analysis has not yet been completed for the Project. Because Project specifics are not available at this time, analysis of the Project's greenhouse gas emissions cannot be completed. As such, the Proposed Project could result in the emission of greenhouse gases during construction and operation which acceptable thresholds. Since a greenhouse gas analysis has not yet been completed for the Proposed Project, it is not possible to determine the impact the Project would have on greenhouse gas and climate change. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

4.9 Hazards and Hazardous Materials

4.9.1 *Environmental Setting*

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined by the California Health and Safety Code, Section 25501 as follows:

> *"Hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a*

reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

A hazardous material is defined in Title 22, Section 662601.10, of the California Code of Regulations as follows:

A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.

The release of hazardous materials into the environment could potentially contaminate soils, surface water, and groundwater supplies.

Glenn County Air Pollution Control District is the Administering Agency and the Certified Unified Program Agency (CUPA) for Glenn County with responsibility for regulating hazardous materials handlers, hazardous waste generators, underground storage tank facilities, above ground storage tanks, and stationary sources handling regulated substances. A Hazardous Materials Business Plan is required of businesses in Glenn County that handle, use, generate, or store hazardous materials. The primary purpose of this plan is to provide readily available information regarding the location, type and health risks of hazardous materials to emergency response personnel, authorized government officials, and the public. Large cases of hazardous materials contamination or violations are referred to the Central Valley Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). It is not uncommon for other agencies to become involved when issues of hazardous materials arise, such as the federal and state Occupational Safety and Health Administrations.

In addition to the local agencies, state and federal agencies regulate various hazardous materials. **Table 4.9-1** lists federal and state regulatory agencies that oversee hazardous materials handling and hazardous waste management, and the statutes and regulations that they administer.

Table 4.9-1. Hazardous Materials Regulatory Authority

Regulatory Agency	Authority
Federal Agencies	
Department of Transportation (DOT)	Hazardous Materials Transport Act - Code of Federal Regulations (CFR) 49
Environmental Protection Agency (EPA)	Federal Water Pollution Control Act Clean Air Act Resource Conservation and Recovery Act (RCRA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Superfund Amendments and Reauthorization Act (SARA) Federal Insecticide, Fungicide and Rodenticide Act
Occupational Safety and Health	Occupational Safety and Health Act and CFR 29

Regulatory Agency	Authority
Administration (OSHA)	
State Agencies	
Department of Toxic Substances Control (DTSC)	California Code of Regulations
Department of Industrial Relations (CAL-OSHA)	California Occupational Safety and Health Act, CCR Title 8
State Water Resources Control Board and Regional Water Quality Control Board	Porter-Cologne Water Quality Act Underground Storage Tank Law
Health and Welfare Agency	Safe Drinking Water and Toxic Enforcement Act
Air Resources Board and Air Pollution Control District	Air Resources Act
Office of Emergency Services	Hazardous Materials Release Response Plans/Inventory Law
Department of Food and Agriculture	Food and Agriculture Code
State Fire Marshal	Uniform Fire Code, CR Title 19

Source: Orland 2010b

Under Government Code Section 65962.5, both the DTSC and the State Water Resources Control Board (SWRCB) are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC (2019) and SWRCB (2019) lists identified no open cases of hazardous waste violations within 0.5 mile of the Project site. The nearest open cases identified are approximately 0.66 and 0.75 mile away (DTSC 2019, SWRCB 2019).

The EPA maintains the Enforcement and Compliance History Online (ECHO) program. The ECHO website provides environmental regulatory compliance and enforcement information for approximately 800,000 regulated facilities nationwide. The ECHO website includes environmental permit, inspection, violation, enforcement action, and penalty information about EPA-regulated facilities. Facilities included on the site are Clean Air Act (CAA) stationary sources; Clean Water Act (CWA) facilities with direct discharge permits, under the National Pollutant Discharge Elimination System; generators and handlers of hazardous waste, regulated under the Resource Conservation and Recovery Act (RCRA); and public drinking water systems, regulated under the Safe Drinking Water Act (SDWA). ECHO also includes information about EPA cases under other environmental statutes. When available, information is provided on surrounding demographics, and ECHO includes other EPA environmental data sets to provide additional context for analyses, such as Toxics Release Inventory data. According to the ECHO program, the Project site is not listed as having a hazardous materials violation (EPA 2019).

4.9.2 *Hazards and Hazardous Materials (VIII) Environmental Checklist and Discussion*

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

The Proposed Project is the development of commercial uses on ±4.2 acres of land. This development may result in the storage of hazardous materials typically sold or stored in stores such as antifreeze, oil and lubricants for vehicle maintenance as well as household cleaning chemicals. The *C-H* zoning district also allows for the development of fueling stations which would permit fuel storage on the site. A fueling station is proposed as part of the Project.

Typical incidents that could result in accidental release of hazardous materials involve leaking storage tanks, spills during transport, inappropriate storage, inappropriate use, and/or natural disasters. If not remediated immediately and completely, these and other types of incidents could cause toxic fumes and contamination of soil, surface water, and groundwater. Depending on the nature and extent of the contamination, groundwater supplies could become unsuitable for use as a domestic water source. Human exposure to contaminated soil or water could have potential health effects depending on a variety of factors, including the nature of the contaminant and the degree of exposure.

Hazardous materials must be stored in designated areas designed to prevent accidental release to the environment. California Building Code requirements prescribe safe accommodations for materials that present a moderate explosion hazard, high fire or physical hazard, or health hazards.

Hazardous materials regulations, which are codified in Titles 8, 22, and 26 of the California Code of Regulations, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code, were established at the state level to ensure compliance with federal regulations and to reduce the risk to human health and the environment from the routine use of hazardous substances. Protection against accidental spills and releases provided by this legislation includes physical and mechanical controls of fueling operations, including automatic shutoff valves; requirements that fueling operations are contained on impervious surface areas; oil/water separators or physical barriers in catch basins or storm drains; vapor emissions controls; leak detection systems; and regular testing and inspection of fueling stations.

Businesses that sell and store hazardous materials are subject to the County's reporting program. The program requires the preparation of a Hazardous Material Business Plan that provides an inventory of hazardous materials on-site, emergency plans and procedures in the event of an accidental release, and training for employees on safety procedures for handling hazardous materials and what to do in the event of a release or threatened release. These plans are routine documents that are intended to disclose the presence of hazardous materials and provide information on actions to be taken if materials are inadvertently released.

The Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. These materials would be required to be used, stored, and disposed in accordance with existing regulations and product labeling and would not create a significant hazard to the public or to the environment. Therefore, the Project would have a **less than significant** impact in this area.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

As discussed in Issue a), the Project would not result in the routine transport, use, disposal, handling, or emission of any hazardous materials that would create a significant hazard to the public or the environment. Potential construction-related hazards could be created during the course of Project construction at the site, given that construction activities involve the use of heavy equipment, which uses small and incidental amounts of oils and fuels and other potentially flammable substances. The level of risk associated with the accidental release of hazardous substances is not considered significant due to the small volume and low concentration of hazardous materials used during construction. The construction contractor would be required to use standard construction controls and safety procedures that would avoid and minimize the potential for accidental release of such substances into the environment. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local, state, and federal law.

Project operation would involve the routine transport, use, and disposal of gasoline for the operation of the gasoline fueling station. Gasoline and all other hazardous materials on the site would be handled in accordance with city, state and federal regulations. Because any hazardous materials used for operations would be controlled in accordance with city, state and federal regulations, long-term impacts associated with handling, storing, and disposing of hazardous materials from Project operation would be **less than significant**.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

The nearest school to the Project site is Orland High School School, approximately 0.88 mile east of the Project site, which is greater than one-quarter mile. Several other schools are located approximately one or more miles away.

The Proposed Project would not emit any hazardous emissions. There is a potential that common hazardous materials may be stored in the proposed new building, including motor oil, diesel exhaust fluid, antifreeze, petroleum distillate based automotive fluids, and heptane based quick start fluids. These materials would be stored, used, and disposed of in accordance with product label instructions and existing state and local regulations. Due to the commonplace nature of the substances to be used, the small amount to be stored, and compliance with existing standards and regulations, this impact is considered **less than significant**.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

Under Government Code Section 65962.5, both the DTSC and the SWRCB are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC and SWRCB lists identified no open cases of hazardous waste violations on the Project site. Therefore, the Project site and the Proposed Project are not on a parcel included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (DTSC 2019, SWRCB 2019). As a result, this would not create a significant hazard to the public or to the environment and would have **no impact**.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard excessive noise for people residing or working in the project area?	☐	☐	☐	☒

The Orland Haigh Field Airport is approximately 3.6 miles southeast of the Project site. The project site is not located in the airport's safety areas as shown on Map 2 of the Comprehensive Airport Land Use Plan for the Orland Haigh Field Airport (Glenn County 1991). Furthermore, the Project does not propose any new structures which may impede aircraft operations. Thus, **no impact** would occur.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

The Proposed Project does not include any actions that would impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. All construction activities for Project construction would occur on-site. Roadway improvements done as mitigation for the Project would follow applicable roadway construction laws and standards as promogulated by Caltrans and the City. Emergency departments would be made aware of all roadway construction and would adjust routes as necessary. Construction would not impede the use of surrounding roadways in an emergency evacuation. Implementation of the Proposed Project would result in a **less than significant** impact in this area

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
h) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The Project site is located in a highly urbanized area that is not subject to wildland fires. Therefore, impacts related to exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires would not occur. There would be **no impact** in this area.

4.10 Hydrology and Water Quality

4.10.1 Environmental Setting

Regional Hydrology

Surface Water

The City of Orland is located in the greater Sacramento River hydrologic region. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of

Alpine and Amador counties are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta (DWR 2006).

The City of Orland and the Project site are located within boundaries of the Stony Creek watershed. The Stony Creek watershed encompasses approximately 700 square miles and is the second largest Sacramento River tributary on the west side of the Sacramento Valley (Orland, 2010b). There are three major impoundments on Stony Creek: Black Butte, Stony Gorge, and East Park reservoirs.

Groundwater

The Project site is underlain by the Sacramento Valley Groundwater Basin and the Colusa Subbasin. The City of Orland uses groundwater as the source for potable water in the City. This groundwater is extracted from the Colusa Groundwater Subbasin. According to the California Department of Water Resources (DWR), the Colusa Subbasin covers an area of approximately 1,434 square miles (918,380 acres) (DWR 2006). The storage capacity of the subbasin was projected based on estimates of specific yield for the Sacramento Valley as developed in DWR Bulletin 118 (DWR 2006). The estimated storage capacity to a depth of 200 feet is approximately 13,025,887 acre-feet (≈ 4.24 trillion gallons). Estimates of groundwater extraction for the Colusa Subbasin are based on surveys conducted by the California Department of Water Resources during 1993, 1994, and 1999. Surveys included land use and sources of water. Estimates of groundwater extraction for agricultural, municipal and industrial, and environmental wetland uses are 310,000; 14,000; and 22,000 acre-feet, respectively. Deep percolation from applied water is estimated to be 64,000 acre-feet. The Department of Water Resources has not identified the Colusa Subbasin as overdrafted in its DWR Bulletin 118. Also, there has been no indication of any existing or anticipated overdraft condition in studies prepared by other entities (DWR 2006).

The DWR Groundwater Information Center Interactive Map Application (GICIMA) provides groundwater levels through the state. Among other things, this interactive on-line tool can illustrate the change in groundwater depth of a certain time period for a particular location, such as the City of Orland. According to the GICIMA information, the distance from groundwater to ground surface in the Project area has increased by approximately 20 feet between the spring of 2008 and the spring of 2018. In other words, the groundwater water surface was 60 feet below ground surface 2008 and was approximately 80 feet below ground surface in 2018 (DWR 2019). However, the depth to groundwater varies by location and rainfall. For example, at the end of the recent drought, from 2014 to 2017, the groundwater to ground surface depth was approximately 95 to 100 feet below the surface in the Fall of 2016 in the Project area. It was 60 to 70 feet below the surface in the eastern part of Orland (DWR 2019).

The Sustainable Groundwater Management Act (SGMA) directs DWR to identify groundwater basins and subbasins in conditions of critical overdraft. As defined in the SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." The Colusa groundwater subbasin is not listed as a critically overdrafted basin (DWR 2018a). DWR is currently working on an update to the Bulletin 118 groundwater report. However, more up to date information of the Colusa subbasin in not available at this time.

Project Site Hydrology and Onsite Drainage

The are no existing natural hydrological features on the ±4.2-acre Project site. There is an irrigation ditch adjacent to the southern boundary along County Road 13 and a small drainage swale within the northern located near the Project site. Recently approved projects are expected to impact these man-made hydrologic features. The Proposed Project would not directly impact either of these features.

The topography of the site is flat with little elevation change. The ±4.2-acre site Project site sits at 265 feet AMSL. Upon completion of the Proposed Project, the site topography would be the same of pre-Project conditions.

Orland experiences extreme seasonal variation in monthly rainfall. The rainy period of the year lasts for 8.9 months, from September 17 to June 15, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered around February 16, with an average total accumulation of 5.9 inches. The rainless period of the year lasts for 3.1 months, from June 15 to September 17. The least rain falls around July 31, with an average total accumulation of 0.0 inches (Weatherspark 2018).

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Project area (Map No. 06021C0400D) shows that the Project site is in unshaded Zone X, meaning that the area is outside of the 0.2 percent annual chance (500-year) floodplain (FEMA 1998).

4.10.2 Hydrology and Water Quality (IX) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐

In accordance with NPDES regulations, the State of California requires that any construction activity affecting 1 acre or more obtain a General Construction Activity Stormwater Permit (General Permit) to minimize the potential effects of construction runoff on receiving water quality. Performance standards for obtaining and complying with the General Permit are described in NPDES General Permit No. CAS000002, Waste Discharge Requirements, Order No. 2009-0009-DWQ.

General Permit applicants are required to submit to the appropriate regional board Permit Registration Documents for the Project, which include a Notice of Intent (NOI), risk assessment, site map, signed certification statement, an annual fee, and a SWPPP. The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, and a detailed construction timeline. The SWPPP must also include implementation of BMPs to reduce construction effects on receiving water

quality by implementing erosion control measures and reducing or eliminating non-stormwater discharges.

Examples of typical construction best management practices included in SWPPPs include, but are not limited to, using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan; and installing sediment control devices such as gravel bags, inlet filters, fiber rolls, or silt fences to reduce or eliminate sediment and other pollutants from discharging to the drainage system or receiving waters. Stormwater pollution prevention plan BMPs are recognized as effective methods to prevent or minimize the potential releases of pollutants into drainages, surface water, or groundwater. Strict SWPPP compliance, coupled with the use of appropriate BMPs, would reduce potential water quality impacts during construction activities.

While there are no creeks, streams or rivers exist on the Project site, there is an irrigation ditch operated by the Orland Unit Water Users' Association on the northern perimeter of the Project site to deliver water to adjacent agricultural fields when necessary (the ditches are predominately dry year-round). The proposed Commerce Lane Plaza Commercial Project would be required to prepare and comply with an approved SWPPP. Compliance with this requirement would reduce the potential water quality impacts to **less than significant**.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐

The City of Orland uses groundwater as the source for potable water in the City. This groundwater is extracted from the Colusa Groundwater Subbasin, part of the Sacramento Valley Groundwater Basin. The California Department of Water Resources (DWR 2006) Bulletin 118 identified the Colusa Subbasin groundwater supply as follows:

> "Generally, groundwater level data show an average seasonal fluctuation of approximate 5-feet for normal and dry years. Overall there does not appear to be any increasing or decreasing trends in groundwater levels."

The Proposed Project would increase the demand for groundwater in the City. The amount of groundwater used by the Proposed Project would depend on the specific type(s) of commercial development constructed at the Project site. The amount of water for the undetermined commercial development(s) cannot be accurately estimated because the use is unknown. The City provides water use estimates based on housing unit equivalent (HUE), the amount of water a single family home would use

on a monthly basis. The average daily water demand per HUE is 571 gallons. The commercial HUE is 3,985 gallons per day (gpd), while the high-density residential HUE is 255 gpd (Orland 2015). Using the commercial use factor, the future commercial development on the two parcels has the potential to result in a commercial water demand of 15,940 gpd.[3] The Project's annual water demand represents 0.0001 percent[4] of the available groundwater in the Colusa Groundwater Subbasin. Therefore, the project would have a **less than significant impact** on groundwater supply.

Additionally, the Proposed Project would have the potential to remove a portion of the ±4.2-acre site's potential groundwater recharge area due to the development of this area with impervious surfaces. However, according to the Orland General Plan Update EIR (Orland 2010b), the majority groundwater recharge in the City comes from Stony Creek. Development of this area would not affect the recharge ability of Stony Creek. Therefore, the project would have a **less than significant impact** on groundwater recharge.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
(iv) impede or redirect flood flows?	☐	☐	☐	☒

When land is in a natural or undeveloped condition, soils, mulch, vegetation, and plant roots absorb rainwater. This absorption process is called infiltration or percolation. Much of the rainwater that falls on

[3] 3,985 gpd/HUE x 4 HUE = 15,940 gpd, 15,940 gpd x 365 days = 5.82 million gallons per year.
[4] 5.82 million gallons of project annual water demand / 4.24 trillion gallons of water in the Colusa Groundwater Subbasin = 0.0001 percent.

natural or undeveloped land slowly infiltrates the soil and is stored either temporarily or permanently in underground layers of soil. When the soil becomes completely soaked or saturated with water or the rate of rainfall exceeds the infiltration capacity of the soil, the rainwater begins to flow on the surface of land to low lying areas, ditches, channels, streams, and rivers. Rainwater that flows off a site is defined as storm water runoff. When a site is in a natural condition or is undeveloped, a larger percentage of rainwater infiltrates into the soil and a smaller percentage flows off the site as storm water runoff.

The infiltration and runoff process is altered when a site is developed. Buildings, sidewalks, roads, and parking lots introduce asphalt, concrete, and roofing materials to the landscape. These materials are relatively impervious, which means that they absorb less rainwater. As impervious surfaces are added to the ground conditions, the natural infiltration process is reduced. As a result, the volume and rate of storm water runoff increases. The increased volumes and rates of storm water runoff can result in accelerated erosion and/or flooding if adequate storm drainage facilities are not provided.

No creeks, streams or rivers exist on or nearby the Project site. As such, siltation of on- or off-site waterways would not occur.

The construction activities for the Proposed Project would result in soil disturbances of at least one acre of total land area. As such, an NPDES Construction General Permit would be required prior to the start of construction. Excavation and grading activities associated with the Proposed Project will reduce vegetative cover and expose bare soil surfaces making these surfaces more susceptible to erosion. To comply with the requirements of the NPDES Construction General Permit AWA will be required to file a NOI with the State of California and submit a SWPPP defining BMPs for construction and post-construction related control of the Proposed Project site runoff and sediment transport. Requirements for the SWPPP include incorporation of both erosion and sediment control BMPs. SWPPP generally include the following applicable elements:

- diversion of offsite runoff away from the construction area;
- prompt revegetation of proposed landscaped areas;
- perimeter straw wattles or silt fences and/or temporary basins to trap sediment before it leaves the site;
- regular sprinkling of exposed soils to control dust during construction during the dry season;
- installation of a minor retention basin(s) to alleviate discharge of increased flows;
- specifications for construction waste handling and disposal;
- erosion control measures maintained throughout the construction period;
- preparation of stabilized construction entrances to avoid trucks from imprinting debris on city roadways;
- contained wash out and vehicle maintenance areas;
- training of subcontractors on general construction area housekeeping;
- construction scheduling to minimize soil disturbance during the wet weather season; and

- regular maintenance and storm event monitoring.

Note that the SWPPP is a "live" document and should be kept current by the person responsible for its implementation. Preparation of, and compliance with a required SWPPP would effectively prevent Proposed Project on-site erosion and sediment transport off-site. This will reduce potential runoff, erosion, and siltation associated with construction and operation of the Proposed Project. The effects of the Proposed Project on onsite and offsite erosion and siltation, therefore, would be **less than significant**.

ii) Implementation of the Proposed Project would alter the existing drainage patterns on the site by adding an impermeable surface to portions of the site. Impervious surfaces will allow stormwater to move more quickly through the site, increasing the rate of runoff. However, all new development would be required to comply with City storm drainage regulations, including Program 4.2.A.2 of Policy 4.2.A of the General Plan which requires that all new development projects be designed to avoid increases in peak storm runoff levels (City of Orland 2010a). Therefore, the Proposed Project would have a **less than significant** impact on causing flooding on- or off-site.

iii) See discussion of Issues i) and ii), above. The nearest existing stormwater drainage facilities are located at the intersection of Commerce Lane/County Road HH and Ide Street/County Road 13 near the southeast corner of the Project site. It is required by the City that the Project site would include improvements to aid in stormwater drainage such as construction of curbs and gutters. The Project site would likely be graded to direct stormwater flows to existing and proposed drainage facilities. All commercial development is required by the City of Orland City Code to provide curbs, gutters and sidewalks along their street frontage. Runoff from the site is not expected to be of sufficient quantity to overwhelm existing and proposed stormwater drainage facilities (2019a). As such, this impact would be considered less than significant.

Activities associated with operation of the Proposed Project are not expected to generate substances that can degrade the quality of water runoff. While potential impacts could result from vehicles and other users at the Proposed Project site during operation, all potential impacts to water quality would be reduced by stormwater pollution control measures and wastewater discharge BMPs required at the Project site as a part of Project development and operation. Therefore, impacts during operation would be considered less than significant.

The Proposed Project would have a **less than significant** impact in regard to creating or contributing to runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

iv) FEMA flood hazard maps (Map No. 06021C0400D) shows that the Project site is in unshaded Zone X. The Project site is not located within a flood zone. Therefore, implementation of the Proposed Project will **no impact** related to impeding or redirecting flood flows

The Proposed Project would have a **less than significant** impact relative to altering drainage patterns.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒

The Project site is not protected by levees from any flood hazard. There are no natural waterways on or near the Project site. According to FEMA flood hazard maps (Map No. 06021C0400D), the Project site is not located within a flood zone. No large bodies of water exist near the Proposed Project site. The Project site is not located within a potential tsunami or seiche inundation area. Damage due to a seiche, a seismic-induced wave generated in a restricted body of water would not occur.

Dam failure, the collapse or failure of an impoundment that causes significant downstream flooding, is a potential hazard for Orland. Flooding of the area below the dam may occur as a result of structural failure of the dam or overtopping. The collapse and structural failure of a dam may be caused by a severe storm, earthquakes, or internal erosion of piping caused by embankment and foundation leakage. Larger dams whose waters could inundate significant portions of the City include the Shasta Dam (in Shasta County) and Black Butte Dam on Stony Creek. Black Butte Dam is subject to flooding the City of Orland Planning Area in approximately two hours as a result of a dam failure.

Black Butte Dam is a federal dam project and is owned, operated, and maintained by the U.S. Army Corp of Engineers (USACE). USACE's dam safety professionals carry out a dam safety program which provides continuous assessment of the dam structure and operation. Therefore, an event such as the failure of Black Butte Dam has an extremely low probability of occurring and is not considered to be a reasonably foreseeable event. Based on the discussion above, there would be **no impact** in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

The City of Orland is a participating member of the Glenn Groundwater Authority (GGA) formed in 2017. However, the Groundwater Sustainability Plan is not anticipated to be completed until 2022 (Glenn County 2019). As such, the Project would have no impact to the groundwater management plan.

The Project site is also located within the Water Quality Control Plan (Basin Plan) for the Central Valley Region - Sacramento River Basin (DWR 2018b). However, as stated under Item C) above, the Project is obliged to comply with water quality protection requirements of the NPDES Construction General Permit BMPs for construction and post-construction related control of the Proposed Project site runoff and sediment transport. Compliance with these requirements would eliminate the potential for conflicts with the water quality control plan. As such, the Project would have a **less than significant** impact in this area.

4.11 Land Use and Planning

4.11.1 Environmental Setting

The Project proposes change the zoning of parcels A and B. Currently, the parcels have a City of Orland General Plan Designation of *C - Commercial* and are zoned as *O-S - Open Space*. The Project would rezone the zoning designation of the parcels to *C-H - Highway Service Commercial*.

The City established the present Commercial designation to allow up to 60 percent building coverage and up to 100 percent coverage by parking/paved areas in the downtown area. This classification is intended to provide for a range of uses including retail stores, restaurants, professional and medical offices, large office complexes, light manufacturing plants, outdoor recreation facilities, hotels, and many other uses involving the sale of a product or a service (City of Orland 2010a).

Rezoning the lots to *C-H* would allow the establishment of highway commercial uses on the Project site. Orland Municipal Code Section 17.44 describes the *C-H* zoning district as an area devoted to providing necessary services and convenience for the traveling public along main roads or at highway intersection frontages at proper intervals and locations in developments designed for safety, convenience and suitable appearance. The minimum lot area for the *C-H* zoning district is 6,000 square feet for parcels being rezoned and located adjacent to an existing *C-H* zone and 20,000 square feet for parcels being rezoned to *C-H* but not adjacent to an existing *C-H* zone. A minimum width of 100 feet is required. Maximum allowed building coverage is 60 percent. Additionally, numerous design requirements exist for *C-H* parcels (Orland 2019a).

4.11.2 Land Use and Planning (X) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Physically divide an established community?	☐	☐	☐	☒

The Proposed Project is located in an area with a variety of land uses. The primary existing uses in the vicinity include commercial, residential, and agricultural uses. The nearest communities are two mobile home parks located to the north, across Newville Road. The Project would not divide these communities. As such, the Proposed Project would have **no impact** in this area.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

The City of Orland General Plan identifies the site as being within the *C* land use designation. With approval of the proposed rezone from *O-S* to *C-H* zoning district, the Project's proposed commercial uses would be consistent with the allowed zoning and land use designation uses. As such, the Proposed Project would not conflict with applicable land use plans, policies, or regulations, and **no impact** would occur.

4.12 Mineral Resources

4.12.1 Environmental Setting

The state-mandated Surface Mining and Reclamation Act of 1975 (SMARA) requires the identification and classification of mineral resources in areas within the State subject to urban development or other irreversible land uses that could otherwise prevent the extraction of mineral resources. These designations categorize land as Mineral Resource Zones (MRZ-1 through MRZ-4).

Stony Creek is located on the northern border of the City. Lower Stony Creek traverses its alluvial fan from Black Butte Dam to the Sacramento River, following one of three major fingers of gravelly soil that represent former channel courses. In-stream gravel mining has been particularly intensive in Lower Stony Creek. Generally, Stony Creek aggregates consist of stream channel deposits, including flood and overbank deposits in the upper reaches, and are classified as MRZ-2a (marginal reserves) (Orland 2010b). However, there is currently no mining activity occurring within, nor is it allowed in, the proposed Planning Area. Furthermore, neither the Orland General Plan nor the Glenn County General Plan identify any mineral resource zones within the City of Orland or the Planning Area (Orland 2010a; Glenn County 1993).

4.12.2 Mineral Resources (XI) Environmental Checklist and Discussion

	Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

As discussed above, neither the City's existing General Plan nor the Glenn County General Plan identifies any mineral resources in the planning area. Therefore, **no impact** would occur to mineral resources.

	Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

The Project site is not identified as a mineral resource recovery site in the Orland General Plan. There would be **no impact** in this area.

4.13 Noise

4.13.1 Environmental Setting

Noise Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels (in L_{dn}/CNEL).

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks, and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Mobile transportation sources, such as highways, and hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source (USEPA 1971).

Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise, but are less effective than solid barriers.

Vibration

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity or root mean square velocity. These velocity measurements measure maximum particle at one point or the average of the squared amplitude of the signal, respectively. Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual's sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

4.13.2 Noise (XII.) Environmental Checklist and Discussion

a)	Would the project result generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
		☒	☐	☐	☐

It is difficult to specify noise levels that are generally acceptable to everyone; what is annoying to one person may be unnoticed by another. Standards may be based on documented complaints in response to documented noise levels or based on studies of the ability of people to sleep, talk, or work under various noise conditions. However, all such studies recognize that individual responses vary considerably. Standards usually address the needs of the majority of the general public.

Construction and operation of the commercial Project would result in an increase of noise levels in the Project vicinity. The noise levels generated by the commercial uses would vary greatly depending upon factors such as the type and model of equipment needed for the commercial uses, the operations being performed, the condition of the equipment, and the prevailing wind direction. As such, without a comprehensive noise analysis, the potential for noise related impacts cannot be determined. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

Would the Project result in		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐

Construction operations have the potential to result in varying degrees of temporary ground vibration and noise levels, depending on the specific construction equipment used and operations involved. As such, without a comprehensive noise analysis, the potential for excessive groundborne vibration or groundborne noise levels cannot be determined. As such, this is considered a **potentially significant impact** and will be further discussed in the subsequent environmental document.

Would the Project result in		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c)	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☐	☒

The nearest airport to the Project site is the Orland Haigh Field Airport, located approximately 3.6 miles southeast of the Project site. The Project site is not located within an area covered by an airport land use plan or within two miles of a public or private use airport. Thus, **no impact** would occur with implementation of the Proposed Project.

4.14 Population and Housing

4.14.1 Environmental Setting

According to the California Department of Finance (DOF), which provides estimated population and housing unit demographics by year throughout the State, the City's population increased 14.3 percent between 2010 and 2019, from 7,291 to 8,337 (DOF 2019a, b). In 2019 there are 3,046 total housing units in the City, and a 5.4 percent vacancy rate as of January 1, 2019. The average household size was estimated to be 2.87 persons per household during the same time period (DOF 2019a).

4.14.2 Population and Housing (XIII) Environmental Checklist and Discussion

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐

The Project site is located within a developed area and no new roads or extensions of existing roads are proposed. The Project does not include the construction of any new homes. Construction of the Project is expected to increase employment at the site. For impact analysis purposes, a maximum buildout scenario of 50 employees is assumed. The majority of the employees would likely already live in the City of Orland or commute to work. If Orland's population were to increase by 50 residents, this would represent a 0.60% population increase from 8,337 in 2019 (DOF 2019 a, b). This slight increase in employment would not

result in a substantial increase in population growth to the City or surrounding area. Therefore, there would be a **less than significant** direct or indirect increase in population growth as a result of the Proposed Project.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

No residences would be displaced or removed as a result of the Proposed Project, and the Project would have no impact on existing housing. Further, the Project would not involve the removal or relocation of any housing and would therefore not displace any people or necessitate the construction of any replacement housing. The Project would have **no impact** in this area.

4.15 Public Services

4.15.1 Environmental Setting

Public services include fire protection, police protection, parks and recreation, and schools. Generally, impacts in these areas are related to an increase in population from a residential development. Levels of service are generally based on a service to population ratio, except for fire protection, which is usually based on a response time. For example, the Orland General Plan Policy PFS-8.11 provides a Police Department staffing ratio of 1.9 officers per 1,000 population. Further, in 2003, the Orland City Council set the park dedication standard at 8.4 acres per 1,000 residents. Finally, the average response time for fire protection and emergency medical services in Orland is three to five minutes for arrival at the station, approximately one minute to prepare and leave the station, and an additional two to three minutes to the actual call site (Orland 2010b).

Police Services

The Orland Police Department (OPD) will provide law enforcement services to the Project site. OPD reported total calls for service was 2,686 in 2018 and arrests had increased to 458; 33 were DUI related and 1/3 were a combination of drugs and alcohol (Orland 2018a). The OPD has patrol service 24 hours a day. The Police Department also offer the following services: certified child seat installer, free bike helmets, Alice Training (Active Shooter Training), and Volunteers in Polices Services Program. The OPD hired two additional patrol officers in 2018, however two new additional officers, one Community Service Officer, a Lieutenant or additional Sergeant position, a full-time Narcotics Task Force officer and a full-time School Resource Officer are planned for the future (Orland 2018a). The City's police station is located at 817 Fourth Street; approximately 1.2 miles east of the Project site.

Fire Services

The City of Orland Volunteer Fire Department (OVFD) will provide fire protection and emergency medical response to the Project site. OVFD responds to various emergency and non-emergency incidents including, but not limited to, all types of fire; medical emergencies; public assists and hazardous situations. As of February 2019, there are 45 active volunteers in the OVFD. There were 702 calls in 2018 (380 city calls and 322 rural calls). Medical calls (440) have increased within the City in the past three years (Orland 2019c). The City's Fire Station is located at 810 Fifth Street, approximately 1.1 miles east of the Project site.

Schools

The Orland Unified School District (OUSD) provides educational services for the City of Orland. The District has two elementary schools (one for grades K-2 and one for grades K-5), one middle schools (grades 6-8), one high school (grades 9-12), and one continuation high school, one community day school (OUSD 2018a, b). The District had 2,210 students in the 2016-2017 school year (OUSD 2018b). According to the California Department of Education, (DOE), the City also has one private school, the Providence Christian School (DOE 2017).

Parks

The City of Orland has six parks ranging in size from 0.26 - 23 acres for a total acreage of 47.16 acres (Orland 2010c). Based on the DOE 2018 estimated City population of 7,844, the City's parkland to population ratio is six acres of parks/1,000 population[5].

4.15.2 Public Services (XIV) Environmental Checklist and Discussion

	Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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 for any of the public services:	☐	☐	☒	☐
	Fire Protection?	☐	☐	☒	☐

[5] 47.16 acres of parks / (7,844 / 1,000) population = 6.0 acres of parks / 1,000 population.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Police Protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other Public Facilities?	☐	☐	☐	☒

Fire Protection

The Project site is located approximately 1.1 miles from the City's fire station. The Project site is currently served by the City for fire protection and development of the site would not increase the response time required for the OVFD. While additional OVFD oversite will be required for future commercial uses at the Project site, the Project would not require additional fire facilities to serve the commercial uses. The Proposed Project would not require any additional OVFD facilities and is not anticipated to create an additional burden on exiting fire facilities. Therefore, the Project would have a **less than significant** impact in this area.

Police Services

The Proposed Project would not result in a significant increase in demand for police protection resulting in new or expanded police facilities. Police facilities and the need for expanded facilities are based on the staffing levels these facilities must accommodate. Police staffing levels are generally based on the population/police officer ratio, and an increase in population is usually the result of an increase in housing or employment. The proposed project would result in minimal employment opportunities; an estimated maximum of 50.

Because the Proposed Project would not increase the population or result in substantial employment gains, the Project would not result in the need for increase in police protection or police facilities. Therefore, the Proposed Project would have a **less than significant** impact in this area.

Schools

The Proposed Project is the development of commercial uses. Because the Proposed Project would not substantially increase the population or result in substantial employment gains, an increase in student population in Orland would not occur and thus additional educational facilities would not be required. Therefore, the Proposed Project would have **no impact** in this area.

Parks

As stated previously, the need for additional parkland is primarily based on an increase in population to an area. Given that the Proposed Project would not substantially increase the City's population, the Project would not burden any parks in the surrounding area beyond capacity by generating additional

recreational users. Therefore, the Proposed Project would not require the construction or expansion of park and recreational facilities and would also not result in an increase in demand for parks and recreation facilities in the surrounding area. There would be **no impact** to parks from construction of the Proposed Project.

Other Public Facilities

The Proposed Project does not result in an increase in housing or population in the City resulting in an increased use of other public facilities such as the Orland Free Library or City Hall. Therefore, the Project would have **no impact** on other public facilities.

4.16 Recreation

4.16.1 Environmental Setting

The City has approximately 47.16 acres of parkland. Additionally, the City also provides recreational facilities, such as adult and youth sports leagues for the enjoyment of City residents.

4.16.2 Recreation (XV) Materials Checklist

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

As stated previously, the need for additional parkland is primarily based on an increase in population to an area. The Proposed Project is expected to require a maximum of 50 employees. It is likely that the majority of the future employees would not relocate to Orland, but rather already live in the Project vicinity or would commute. Given that the Proposed Project would not significantly increase the City's population, the Project would not burden any parks in the surrounding area beyond capacity by generating additional recreational users. Therefore, the Proposed Project would not increase the use of park and recreational facilities resulting in substantial physical deterioration of the facility. There would be **no impact** on recreational facilities from construction of the Proposed Project.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

The Proposed Project would not result in additional athletic amenities or require the construction or expansion of additional recreational facilities. As such, the Proposed Project would have a **no impact** in this issue area.

4.17 Transportation

4.17.1 Environmental Setting

Existing Roadway Network

The Proposed Project site is located in the City of Orland between the Commerce Lane/ Newville Road intersection and the Commerce Lane/ County Road HH intersection. The Proposed Project will be served by several major roadways. Regional access is provided by Interstate 5 and State Route 32, which link the site with the other Northern California communities to the north and south and with the City of Orland to the east. Local access to the project site is provided via Newville Road and County Road HH.

Existing Alternative Transportation Modes

Sidewalks

Concrete and asphalt sidewalks exist at various locations along most City of Orland streets but become less prevalent on Glenn County roads adjoining the community. As noted in **Table 4.17-1**, there are few sidewalks in the area west of I-5 although there is existing sidewalk on the north side of Newville Road (SR 32) across I-5.

Table 4.17-1. Sidewalk Inventory

Street	From	To	Side	Sidewalk
Newville Road	County Road HH	Southbound I-5 ramps	North	Partial
			South	No
	Southbound I-5 ramps	Northbound I-5 ramps	North	Yes
			South	No
	Northbound I-5 ramps	9th Street – Tehama Street	North	Yes
			South	Partial
	9th Street – Tehama Street	8th Street	North	Yes
			South	Yes
County Road HH	Newville Road	County Road 13	East	Yes
			West	No
	County Road 13	County Road 14	East	No
			West	No

Source: KD Anderson & Associates 2018

Bicycle Facilities

Presently there are no formally designated bicycle lanes or bicycle facilities in the City of Orland. However, the City understands the need to move people through the community. The City is planning multi-use pathways along Stony Creek, as well as multi-use pathways within the rights-of-way of undergrounded canals. Additionally, street widths can accommodate bicycle traffic in some areas, and bicycle racks are available at schools and parks.

Public Transit

Public transportation bus service is provided to the City of Orland through Glenn Ride, which is a transit service provided by Glenn County. It is a fixed-route bus system with seven round trips every weekday and three round trips on Saturday from Willows to Chico. There are currently 14 bus stops in Orland. The stop

closest to the Proposed Project is at the 9th Street / Newville Road intersection (i.e., CVS Pharmacy & Burger King).

4.17.2 *Transportation (XVII.) Environmental Checklist and Discussion*

	Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities?	☒	☐	☐	☐

The Proposed Project is anticipated to increase roadway traffic and may affect the local roadways, including bicycle and pedestrian facilities. Therefore, this is a **potentially significant impact** that will be discussed further in the subsequent environmental document.

	Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☒	☐	☐	☐

CEQA Guidelines Section 15064.3, subdivision (b) provides criteria for analyzing transportation impacts based on a vehicle miles traveled (VMT) methodology instead of the now superseded (as of January 1, 2019) level of service (LOS) methodology. Pertinent to the Proposed Project are those criteria identified in Section 15064.3(b)(1) Land Use Projects. According to this section:

> "Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor[6] should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact."

However, Section 15064.3(b)(3) allows an agency to determine a project's transportation impact on a qualitative basis if a VMT methodology is unavailable, as is the case with the Proposed Project.

[6] "High-quality transit corridor" means an existing corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. For the purposes of this project, an "existing stop along a high-quality transit corridor" may include a planned and funded stop that is included in an adopted regional transportation improvement program.

Section 15064.3(b)(3) is as follows:

> "Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate."

Additionally, Section 15064.3(c) allows an agency to use the VMT methodology immediately or defer until July 1, 2020 when the VMT methodology is required of all agencies in the state. Section 15064.3(c) is as follows:

> "The provisions of this section shall apply prospectively as described in section 15007. A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide."

Since the City does not have an adopted VMT methodology at this time, the City has chosen to defer to the existing LOS methodology to determine the Project's impact to local roadways.

The Proposed Project would increase the amount of traffic on the local roadways. The Project has the potential to contribute to a significant LOS impact, depending on the amount of traffic generated by the Proposed Project. This is a **potentially significant impact** that will be discussed further in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐

No modifications to roadway features have been proposed as part of the Project. The Project would construct entryways into the Project site and proposes the Commerce Court entrance off Commerce Lane. The preliminary conceptual development plan for the Project (**Figure 3**) proposes one entrance directly off Commerce Lane and several access points from the round-about: one two-way access point to the convenience store, and two two-way access points to the three restaurants. Entryways/roadway interfaces would be required to be located and constructed according to City of Orland roadway standards. However, the Project may result in left turn channelization on Commerce Lane (County Road HH), which may impact traffic safety and therefore result in modification to the existing roadways system.

Modifications to the local roadways may result in a **potentially significant impact**. As such, how the Proposed Project will affect these roadways will be discussed further in the subsequent environmental document.

Would the Project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
d) Result in inadequate emergency access?	☐	☐	☒	☐

The Project would require multiple access points for customers and emergency access. The Conceptual Development Plan (**Figure 3**) depicts several access points to the Project site. Therefore, the Project would have a **less than significant impact** regarding emergency access.

4.18 Tribal Cultural Resources

4.18.1 Environmental Setting

The project area is located within what is historically documented as Central Wintun (Nomlaki) territory. There were two major divisions of Nomlaki Indians in California: the Hill Nomlaki and the River Nomlaki. The Hill Nomlaki are identified as the Paskenta Band of Nomlaki Indians. It is this group that has ancestral ties to the Orland area, which includes the project area. Euro-American contact with Native American groups living in the Central Valley of California began during the last half of the eighteenth century. At this time, the attention of Spanish missionaries shifted away from the coast, and its dwindling Native American population, to the conversion and missionization of interior populations.

4.18.2 Tribal Cultural Resources (XVII) Environmental Checklist and Discussion

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☒	☐	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of	☒	☐	☐	☐

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.				

A cultural resources survey, including tribal consultation, has not been completed for the Project site. As such, there is a potential for the Project to impact tribal cultural resources on the on the site. The extent of this potential impact has not been determined at this time. As such, this is a **potentially significant impact** that will be discussed in the subsequent environmental analysis.

4.19 Utilities and Service Systems

4.19.1 Environmental Setting

The City of Orland Public Works Department is responsible for water, wastewater, and storm drainage for the City. The City contracts with Waste Management to provide solid waste collection services in the City.

Water Service

The source of water supply for Orland is groundwater pumped from six wells that produce between 350 and 1,090 gallons per minute (gpm). The wells are located throughout the City and range in depth from 150 - 400 feet. Gravity flow from an 80,000-gallon elevated storage tank provides the water pressure in the City. The water transmission and distribution systems consist of approximately 34 miles of pipeline ranging in diameter from 4-10 inches. The water system is operated at 50-65 pounds per square inch (psi) pressure under normal demand. The six wells are capable of producing 5,130 gpm at 55 psi system pressure. The average daily water demand per housing unit equivalent (HUE) is 571 gallons. The commercial HUE is 3,985 gpd, while the high-density residential HUE is 255 gpd (Orland 2015).

City water is obtained from the Colusa Groundwater Subbasin. There is not a regulated limit to the amount of groundwater that can be pumped by the various groundwater users, including the City of Orland, in this subbasin. The only limitation to groundwater extraction would be the to the City's water supply would be the pumping capacity of the six wells and the availability of water. As discussed in Section 4.10, the estimated storage capacity of the groundwater subbasin to a depth of 200 feet is approximately 13,025,887 acre-feet or 4,244.5 billion gallons. Estimates of groundwater extraction for the Colusa Subbasin are based on surveys conducted by the California DWR during 1993, 1994, and 1999. Surveys included land use and sources of water. Estimates of groundwater extraction for agricultural, municipal, and industrial, and environmental wetland uses are 310,000; 14,000; and 22,000 acre-feet, respectively. Deep percolation from applied water is estimated to be 64,000 acre-feet. The DWR has not identified the Colusa Subbasin as overdrafted in its DWR Bulletin 118. Also, there has been no indication of any existing or anticipated overdraft condition in studies prepared by other entities (DWR 2006).

The DWR Groundwater Information Center Interactive Map Application (GICIMA) provides groundwater levels through the state. Among other things, this interactive on-line tool can illustrate the change in groundwater depth of a certain time period for a particular location, such as the City of Orland. According to the GICIMA information, the distance from groundwater to ground surface in the Project area has increased by approximately 20 feet between the spring of 2008 and the spring of 2018. In other words, the groundwater water surface was 60 feet below ground surface 2008 and was approximately 80 feet below ground surface in 2018 (DWR 2019). However, the depth to groundwater varies by location and rainfall. For example, at the end of the recent drought, from 2014 to 2017, the groundwater to ground surface depth was approximately 95 to 100 feet below the surface in the Fall of 2016 in the Project area while it was 60 to 70 feet below the surface in the eastern part of Orland (DWR 2019).

Wastewater

All sewage is collected and processed by the Orland Wastewater Facility. The facility utilizes a primary treatment process consisting of a bar-screen located at the headworks building with screened effluent disposed into a rotating series of four sewage disposal ponds located west of the airport. These four primary settling ponds, along with two specially lined and isolated brine ponds, are located on a 50-acre, City-owned parcel of land.

The wastewater facility is currently operating under Waste Discharge Requirements Order No. 96-129, which was adopted by the Central Valley Regional Water Quality Control Board on May 3, 1996. The City's Waste Discharge Requirements indicate that the design capacity in 1996 for the four stabilization ponds and disposal field was 2.1 million gallons per day (mgd), with an average domestic wastewater flow of 1.3 mgd (Orland 2010b). The City has recently updated the wastewater facility by adding the Blue Frog Aeration System to the facility's aeration ponds. The addition of the Blue Frog Aeration System allows for better wastewater processing.

According to the City's Public Works Department, the City's Wastewater Facility currently has an average flow of about 1.0 million gallons per day (mgd). The capacity of the collection system is 3.4 mgd (based on peak flow) and the facility's capacity is 2.1 mgd (based on average flows). Based on these numbers, the system is operating at approximately 70 percent of capacity (Orland 2018c). The City's estimated population as of January 1, 2019 was estimated to be 8,337 (DOF 2019). The wastewater facility can support a population of approximately 12,000 (Orland 2010b).

Storm Drainage

The City of Orland stormwater drainage system consists primarily of surface water conveyance utilizing curbs and gutters which lead to underground drainage pipes that eventually discharge into the Lely Aquatic Pond, the Stony Creek Basin Tributary Area, or onsite retention basin and leach field systems.

Approximately 80 percent of the City's area is served by, and discharges into, the Lely Aquatic Pond. The City Engineer estimates that this pond is capable of accommodating all storm events up to and including a 50-year storm (City of Orland 2010b). Storm events which exceed this return interval will cause some localized ponding of runoff throughout the City within street roadbeds. Should the groundwater table become elevated due to cumulative stormwater runoff and percolation (likely occurring in late winter

through early spring), the Lely Aquatic Pond capacity decreases, thereby resulting in a situation where larger storm events may cause the pond to exceed its capacity. When this occurs, runoff flows southeasterly along East South Street (County Road 200) until it reaches the Tehama-Colusa Canal, which thereafter becomes a dike preventing further street flow (Orland 2010b).

Solid Waste

The City of Orland is a member of the Glenn County Waste Management Regional Agency. The California Department of Resources Recycling and Recovery (CalRecycle) provides solid waste disposal and recycling information for jurisdictions in the state, including the Glenn County Waste Management Regional Agency.

As shown in **Table 4.19-1**, the majority of the Agency's solid waste is disposed of at the Glenn County Landfill. According to the figures published by the CalRecycle (2019a), in 2017, the Glenn County Landfill received approximately 98.8 percent of the Agency's solid waste, or 19,999 tons (CalRecycle 2019a).

Table 4.19-1. Solid Waste Disposal Facilities Used by the Glenn County Waste Management Regional Agency

	Solid Waste Disposal (tons/year)			Landfill Information		
Destination Facility	2015	2016	2017	Remaining Capacity (cubic yards)	Remaining Capacity Date	Cease Operation Date
Altamont Landfill and Resource Recovery	4	-	-	65,400,000	12/31/2014	1/1/2025
Anderson Landfill, Inc	10	10	1	51,512,201	9/30/2012	1/1/2045
Foothill Sanitary Landfill	-	-	2	138,000,000	6/10/2010	12/31/2082
Forward Landfill, Inc.	9	10	103	22,100,000	12/31/2012	1/1/2020
Glenn County Landfill	19,956	21,186	19,759	866,521	2/28/2015	7/1/2016
Neal Road Recycling and Waste Facility	33	53	22	20,847,970	7/1/2009	1/1/2033
North County Landfill & Recycling	-	2	-	35,400,000	12/31/2009	12/31/2048
Potrero Hills Landfill	16	174	83	13,872,000	1/1/2006	2/14/2048
Recology Hay Road	6	161	20	30,433,000	7/28/2010	1/1/2077
Recology Ostrom Road LF Inc.	1	18		39,223,000	6/1/2007	12/31/2066
Vasco Road Sanitary Landfill	1	-		7,379,000	10/31/2016	12/31/2023
Yolo County Central Landfill	-	110	4	n/a	n/a	1/1/2081
Yearly Total	20,038	21,724	19,999			
Average per Resident (lbs./day)	3.8	4.2	3.8			
Average per Employee (lbs./day)	12.6	13.4	12.3			

Source: CalRecycle 2019a, 2019b, and 2019c

4.19.2 *Utilities and Service Systems (XVIII) Environmental Checklist and Discussion*

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐

Water

Development of the Project would increase the demand for water in the City. According to the Orland Public Works Department, the average daily water demand per commercial housing unit equivalent (HUE) is 3,985 gpd (Orland 2015). Using this factor, the future commercial development on the two parcels has the potential to result in a commercial water demand of 15,940 gpd[7] (5.8 million gallons per year).

The City's six wells are capable of producing 5,130 gallons per minute (gpm) at 55 psi system pressure (approximately 7.38 million gpd). The City's Water System Capacity Study (2014) identified a 2014 maximum daily demand of approximately 5,400 gpm and a combined maximum daily demand plus fire flow demand of approximately 7,900 gpm. Since that time, the City has developed the Eva Drive well, which is anticipated to produce between 1,000 gpm and 1,250 gpm of water. Generally, the City operates only two of the wells during the low water demand months and up to five during the high demand summer months, all running at about 60 percent capacity (Orland 2018c). The Project represents an estimated increase of 0.20 percent of the City's maximum potential pumping capacity if 15,940 gpd are used.[8] There is a ten-inch water transmission line located in County Road HH adjacent to the Project site. All onsite water infrastructure would be installed by the Proposed Project. Therefore, the Project would have a less than significant impact to the City's water treatment or conveyance facilities.

Based on the City existing groundwater pumping ability and the fact that currently there is not a regulated limit on the amount of groundwater that can be extracted for the Colusa Groundwater Subbasin, the future commercial water demand of 15,940 gpd would not result in the need for additional City's water treatment or conveyance facilities. As such, the future commercial uses would have a **less than significant** impact on the City's water treatment or conveyance facilities.

[7] 3,985 gpd/HUE x 3 HUE = 15,940 gpd
[8] (15,940 gpd / 7.38 million gpd) x 100 = 0.20 percent

Wastewater

Wastewater generated by the Project would be conveyed to the City's Wastewater Facility for processing via existing sewer collection facilities located in County Road HH, adjacent to the Project site. As described previously, the current capacity of the plant is limited to 2.1 mgd; the Wastewater Facility treats an average 1.0 mgd of wastewater and is capable of treating up to 3.4 mgd during peak wet weather flow.

According to the Orland Sewer Master Plan, commercial uses are equal to 5.4 housing equivalents (HE) per acre. A housing equivalent is defined as an "area that will produce the same amount of wastewater flow as one single family home within a low-density location" (Orland 2009). According to the City's Public Works Department, the average single-family home produces approximately 431 gpd of wastewater (Orland 2015). Based on this information, the future commercial uses of the Proposed Project would account for 22.68 HEs or 9,775.08 gpd of wastewater.[9] This increased demand would represent 0.67 percent of the 1.45 mgd remaining plant capacity. Since there is adequate capacity remaining at the Wastewater Facility to serve future commercial uses at the Project site, the Proposed Project would not result in the need for new or expanded facilities. This impact would be considered **less than significant**.

Storm Drainage

The nearest existing stormwater drainage facilities are located at the intersection of Commerce Lane/County Road HH and Ide Street/County Road 13 at the southeast corner of the Project site. It is likely that the Project will require the construction of curbs and gutters to facilitate proper drainage. The Project site likely would be graded to direct stormwater flows to existing and proposed drainage facilities. All commercial development is required to provide curbs, gutters and sidewalks along their street frontage as required by City Code. As such, the Proposed Project would not result in the need for new or expanded stormwater facilities. This impact would be considered **less than significant**.

Electric Power

Pacific Gas and Electric (PG&E) provides electrical services to the Project area through state-regulated public utility contracts. PG&E's ability to provide its services concurrently for each project is evaluated during the development review process. The utility company is bound by contract to update its systems to meet any additional demand. Existing electrical facilities are located on County Road HH, adjacent to the Project Site. No new PG&E electric facilities will be required to provide electricity to the Project. Therefore, the Project would have a **less than significant** impact in this area.

Natural Gas

Existing PG&E natural gas pipelines are located on County Road HH and County Road 13 adjacent to the Project site. All on-site lines would be required to be constructed by the Project as necessary. No new

[9] Wastewater demand: 4.2 acres (as shown in Table 2.2-1) X 5.4 HE/acre = 22.68 HEs. 22.68 X 431 gpd of wastewater = 9,775.08 gpd of wastewater

PG&E natural gas facilities would be required to be constructed to serve the site. As such, the Project would have a **less than significant** impact to natural gas facilities.

Telecommunications

Existing phone lines are located adjacent to the Project site. Telecommunication will be through existing company and personal cell phones. No new telecommunication facilities will be required to serve the Project. There would be **no impact** to telecommunications.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐

Refer to item a) above. The impact in this area would be **less than significant**.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐

Refer to item a) above. The impact in this area would be **less than significant**.

Would the Project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐

According to CalRecycle (2019c), the estimated solid waste generation rates for employees is 15.4 pounds per employee per day. Based on this information and an anticipated maximum of 50 employees upon completion of the Project, the Project is anticipated to generate solid waste at a rate of 770 pounds per

day (lbs/day) or 138.6 tons annually.[10] In 2017, the Glenn County Landfill received approximately 19,999 tons of solid waste (CalRecycle 2019a). Thus, the solid waste produced by the Proposed Project would make up approximately 0.70 percent[11] of the annual waste taken in by the Glenn County Landfill.

As shown in **Table 4.19-1**, the Glenn County Landfill, which is the City's main disposal site for solid waste disposal, has a cease operation date of July 1, 2016. This date has been extended until sometime in 2020 (CalRecycle 2019d). Once this facility is closed, the City will have to find an alternative disposal site. However, the Proposed Project would not substantially increase solid waste in the City and existing landfills have sufficient capacity to accommodate the relatively minor amounts of waste that would be generated by the Proposed Project. This is a **less than significant** impact.

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Comply with federal, state, and local statutes and management and reduction regulations related to solid waste?	☐	☐	☒	☐

The Proposed Project is required to comply with all state and federal statutes regarding solid waste. This impact is considered **less than significant**.

4.20 Wildfire

4.20.1 Environmental Setting

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The Project site is not in an area designated by California Department of Forestry and Fire Protection (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. Finally, the location of the Project site makes it readily accessible by emergency personnel and vehicles in the event of a wildland fire. For these reasons, wildfire is not considered a significant risk for the Proposed Project.

[10] 770 lbs/day X 365 days / 2000 lbs/ ton = 140.53 tons per year.
[11] 140.53 tons per year/ 19,999 tons per year= 0.70 percent.

4.20.2 Wildfire (XX) Environmental Checklist and Discussion

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

The Project site is not in an area designated by California Department of Forestry and Fire Protection (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. Also, the Project site is not located in a state responsibility area. The Project would have **no impact** in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point.

The Project site is relatively flat and it is not located near any steep slopes. It is located in an area that is includes a mixture of uses ranging from urban to agricultural to commercial to industrial. These uses are not considered at a significant risk of wildlife.

In addition, as mentioned previously, the Project site is not in an area designated by California Department of Forestry and Fire Protection (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. Also, the Project site is not located in a state responsibility area. The Project would have **no impact** in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or	☐	☐	☐	☒

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
that may result in temporary or ongoing impacts to the environment?				

The Project site is not in an area designated by California Department of Forestry and Fire Protection (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. The Project would have **no impact** in this area.

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Landslides encompass the following occurrences: rockfalls, shallow slope failure, and deep slope failure. The risk of a landslide is acerbated following the occurrence of a fire on steep slopes. The primary factors that influence landslide risk include geologic conditions, the slope, drainage of the soil, and the type of vegetation. Cut and fil for the construction of new roadways can also have increased landslide potential.

The Proposed Project site is very level and not located within the vicinity of any slopes with landslide potential. The Proposed Project also does not require the construction of new roadways. The Project site is not in an area designated by California Department of Forestry and Fire Protection (2007) as a Fire Hazard Severity Zone. Furthermore, no Very High Fire Hazard Severity Zones are located nearby. The Project would have **no impact** in this area.

4.21 Mandatory Findings of Significance

4.21.1 Mandatory Findings of Significance (XIX.) Environmental Checklist and Discussion

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐

As discussed in Sections 4.4 Biological Resources, 4.5 Cultural Resources, and 4.18 Tribal Cultural Resources, the Proposed Project may have potentially significant impacts to biological, cultural, and tribal cultural resources. Potential impacts to these resources should be further analyzed in a subsequent environmental document.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) 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)?	☒	☐	☐	☐

Implementation of the Proposed Project, in conjunction with other approved or pending projects in the region, has the potential to result in cumulatively considerable impacts to the physical environment. These potentially significant cumulative impacts should be further analyzed in a subsequent environmental document.

Does the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

Direct and indirect impacts to human beings may occur as a result of implementation of the Proposed Project. Based on preliminary analysis, the Project has the potential to contribute to significant transportation, noise, and air quality impacts. These potentially significant impacts should be further analyzed in a subsequent environmental document.

SECTION 5.0 LIST OF PREPARERS

5.1 City of Orland

Lead Agency

Peter Carr, City Manager

Scott Friend, City Planner

5.2 ECORP Consulting, Inc.

CEQA Initial Study Analysis

Mike Martin, Senior Environmental Planner

Claire Lester, Assistant Environmental Planner

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 6.0 BIBLIOGRAPHY

[CAL FIRE] California Department of Forestry and Fire protection

2007 Fire Hazard Severity Zones in SRA. Adopted November 7, 2007. https://osfm.fire.ca.gov/media/6450/fhszs_map11.jpg.

[CAPCOA] California Air Pollution Control Officers Association.

2013 Health Effects. http://www.capcoa.org/health-effects/.

[CalRecycle] California Department of Resources Recycling and Recovery

2019a. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx.

2019b Jurisdiction Diversion/Disposal Rate Summary. http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx.

2019c SWIS Facility/Site Search. http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx.

2019d Glenn County Landfill – Disposal Facility Inspection Repot (52).

[Caltrans] California Department of Transportation

2002 Guide for the Preparation of Traffic Impact Studies

2018 California Scenic Highway Mapping System. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm. Accessed: August 20, 2019.

[CAPCOA] California Air Pollution Control Officers Association

2013 Health Effects. http://www.capcoa.org/health-effects/.

[CARB] California Air Resources Board

2016 *State and Federal Area Designation Maps*. http://www.arb.ca.gov/desig/adm /adm.htm.

2013 Glenn County APCD List of Current Rules. https://ww3.arb.ca.gov/drdb/gle/cur.htm.

2005 *California Almanac of Emissions and Air Quality*. https://ww3.arb.ca.gov/aqd/almanac/almanac05/almanac05.htm.

[CDFW] California Department of Fish and Wildlife

2018 *California Natural Communities List*. Available at: https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities/List#natural communities lists. Accessed July 1, 2019.

CGS (California Department of Conservation, California Geological Survey).

1960 Geologic Atlas of California – Ukiah Sheet http://www.quake.ca.gov/gmaps/GAM/ukiah/ukiah.html.

2002 California Geomorphic Provinces. http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_36/Documents/note_36.pdf.

2010 An Explanatory Text to Accompany the Fault Activity Map of California. http://www.conservation.ca.gov/cgs/cgs_history/Documents/FAM_phamplet.pdf.

2015 CGS Information Warehouse: Regulatory Maps. http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps.

2016 Earthquake Shaking Potential for California [map]. ftp://ftp.conservation.ca.gov/pub/dmg/pubs/ms/048/MS_048_revised_2016.pdf.

[CNPS] California Native Plant Society

2019 Inventory of Rare and Endangered Plants in California (online edition, v8-02). California Native Plant Society. Sacramento, CA. Available online: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed July 2019.

[DOC] California Department of Conservation, Division of Land Resource Protection

1997 California Land Evaluation and Site Assessment Model Instruction Manual. https://www.conservation.ca.gov/dlrp/Documents/lesamodl.pdf.

2015 *California Farmland Conversion Report 2015.* http://www.conservation.ca.gov/dlrp/fmmp/Pages/FMMP_2010-2012_FCR.aspx.

2016a Important Farmland Data Availability – County Data. https://www.conservation.ca.gov/dlrp/fmmp/Pages/county_info.aspx.

2016b Glenn County Williamson Act FY 2015/2016. Available at: ftp://ftp.consrv.ca.gov/pub/dlrp/wa/Glenn_15_16_WA.pdf. Accessed: August 14, 2019.

2019 Important Farmland Finder. Available at: https://maps.conservation.ca.gov/dlrp/ciff/. Accessed: October 29, 2019.

[DOE] California Department of Education

2017 2016 - 2017 Private School Directory. https://www.cde.ca.gov/ds/si/ps/index.asp.

[DOF] California Department of Finance

2019a E-1 Population Estimates for Cities, Counties and the State – January 1, 2018 and 2019. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-1/.

2019b E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2019 with 2010 Census Benchmark. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

[DTSC] California Department of Toxic Substances Control

2019 Hazardous Waste and Substance Site List http://www.envirostor.dtsc.ca.gov/public/. Accessed August 22, 2019.

[DWR] California Department of Water Resources

2006 California's Groundwater Bulletin 118 – Update 2006. https://www.water.ca.gov/LegacyFiles/pubs/groundwater/bulletin_118/basindescriptions/5-21.52.pdf.

2019 Groundwater Information Center Interactive Map Application. https://gis.water.ca.gov/app/gicima/#bookmark_DepthBelowGroundSurface.

2018a Groundwater Basins Subject to Critical Conditions of Overdraft. https://www.water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins.

2018b The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region. May 2018. https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

[ECDMS] California Energy Consumption Data Management System

2019 Website: Electricity and Natural Gas Consumption by County. http://www.ecdms.energy.ca.gov/.

[EPA] California Environmental Protection Agency

2019 Enforcement and Compliance History Online (ECHO). https://echo.epa.gov/facilities/facility-search/results.

2007 California State Goods Movement Action Plan. https://ww3.arb.ca.gov/gmp/docs/gmap-1-11-07.pdf.

[EPA] United States Environmental Protection Agency

1971 *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

[FEMA] Federal Emergency Management Agency

1998 FIRM Flood Insurance Rate Map. Map No. 06021C0165D. Effective Date August 16, 2010.

Glenn County

2019 Glenn County: Colusa Subbasin Factsheet. https://www.countyofglenn.net/sites/default/files/Water_Resources/SGMA/SUBBASIN%20FACTSHEET_Colusa_FINAL.pdf.

2018 Glenn County Code. https://www.countyofglenn.net/govt/county-code.

1991 Comprehensive Airport Land Use Plan Orland Haigh Field Airport. http://www.countyofglenn.net/sites/default/files/Airports/Orland_Airport_Land_Use_Plan-1991.pdf.

1993 General Plan. June 1993. http://www.countyofglenn.net/dept/planning-community-development-services/planning/resources

County of Glenn Zoning Map. http://gis.gcppwa.net/zoning/. Accessed August 15, 2019.

Goldschmidt, W. R.

1978 "Nomlaki." In California, edited by Robert F. Heizer, pp. 341-349. Handbook of North American Indians, William C. Sturtevant, general editor, vol. 8. Smithsonian Institution, Washington, D.C.

Intergovernmental Panel on Climate Change [IPCC]

2014. *Climate Change 2014 Synthesis Report: Approved Summary for Policymakers.* http://www.ipcc.ch/.

[NRCRS] Natural Resources Conservation Service

1992 *The Development of the Land Capability Classification.* NRCS History Articles. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?cid=nrcs143_021436. Accessed August 23, 2019.

2019 Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed August 20, 2019

[NSVPA] North Sacramento Valley Planning Area

2015 *Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan,* Sacramento Valley Basinwide Air Pollution Control Council, 2015.

Orland, City of

2009 City of Orland Sewer Master Plan. http://cityoforland.com/_documents/SEWERMASTERPLAN.pdf.

2010a City of Orland General Plan 2008-2028. http://www.cityoforland.com/govt/dept/planning/forms.asp.

2010b General Plan Update Draft Environmental Impact Report, SCH No. 2008102073. http://www.cityoforland.com/_documents/OrlandGeneralPlanDEIR27-0153_FINAL6-25.pdf.

2010c General Plan Background Report.

2015 Pilot Flying J Travel Center and Westside Annexation Area Project Draft Environmental Impact Report. State Clearinghouse No. 2014102084. March 2015

2018a Orland Police Department, 2018 Summary. http://cityoforland.com/_documents/2018OrlandPoliceDept.pdf.

2018b Orland Park Guide. http://cityoforland.com/govt/dept/recreation/parks.asp.

2018c. Personal communication with the Public Works Department.

2019a Code of Ordinances. https://library.municode.com/ca/orland/codes/code_of_ordinances?nodeId=TIT17ZO_CH17.44HISECOZO.

2019b City of Orland Interactive Viewer Map. https://planningsites.org/OrlandPlanning/. Accessed August 15, 2019.

[OUSD] Orland Unified School District

2018a OUSD web site - Orland Schools. http://www.orlandusd.net/Schools/Orland-Schools/index.html.

2018b OUSD web site – Accountability – 2017 SARC Report. http://www.orlandusd.net/Schools/Accountability/index.html

[SMAQMD] Sacramento Metropolitan Air Quality Management District

2016 Thresholds of Significance Table. http://www.airquality.org/businesses/ceqa-land-use-planning/ceqa-guidance-tools

1992 Federal Attainment Plan for Carbon Monoxide.

[SWRCB] State Water Resources Control Board

2010 Storm Water Program, 2009-0009-DWQ Construction General Permit. http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

2018 Geotracker. Accessed August 22, 2019. http://geotracker.waterboards.ca.gov.

[USGS] U.S. Geological Survey

2018a Alluvial Deposits. https://geomaps.wr.usgs.gov/archive/scamp/html/scg_surf_alluv.html.

2018b Areas of Land Subsidence in California. https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html. Accessed August 22, 2019.

Weatherspark

2018 Average Weather in Orland California, United States. https://weatherspark.com/y/650/Average-Weather-in-Orland-California-United-States-Year-Round.