Traffic Impact Analysis Report

Brown Bear Hotel & Conference Center and Residential Development

Located on the Southeast Quadrant of Brown Bear Lane and State Route 49

In the County of Mariposa, California

Prepared for:

MRCC Properties, LLC
PO Box 1886
Mariposa, CA 95338

June 19, 2020

Project No. 012-004

JLB TRAFFIC ENGINEERING, INC.

Traffic Engineering, Transportation Planning, & Parking Solutions

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Phone: (559) 570-8991
www.JLBtraffic.com

JLB TRAFFIC ENGINEERING, INC.

Traffic Engineering, Transportation Planning, & Parking Solutions

Traffic Impact Analysis Report

For the Brown Bear Hotel & Conference Center and Residential Development located on the southeast quadrant of Brown Bear Lane and State Route 49

In the County of Mariposa, CA

June 19, 2020

This Traffic Impact Analysis Report has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions, and decisions are based.

Prepared by:

Jose Luis Benavides, PE, TE

President

REGISTERED PROFESSIONAL ENGINEER
JOSE LUIS BENAVIDES
No.T 2328
Exp:06/30/21
TRAFFIC
STATE OF CALIFORNIA

JLB TRAFFIC ENGINEERING, INC.

Traffic Engineering, Transportation Planning, & Parking Solutions

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
Phone: (559) 570-8991
www.JLBtraffic.com

Table of Contents

List of Figures

List of Tables

List of Appendices

Introduction and Summary

Introduction

This Report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Brown Bear Hotel & Conference Center and Residential Development (Project) located in the unincorporated community of Mariposa in Mariposa County, California. The Project proposes to be constructed in two phases. Phase I will develop a 180-room hotel with a conference center (Brown Bear Hotel and Yosemite Conference Center), while Phase II proposes to construct 96 units of multifamily housing (Residential Development). While the Project is planned for construction in phases, this TIA assumes full Project buildout.

The hotel component (4987 Brown Bear Lane) will provide 180 rooms including 126 standard rooms, 14 nightly suites, and 40 extended stay suites. The hotel will include a 5,000-square-foot conference center, a 1,800-square-foot restaurant (80 seats), a 1,426 square-foot lobby lounge (40 seats), a 575-square-foot fitness center, an outdoor pool, a garden area, an outdoor wedding venue, and an outdoor barbeque area. The conference center will be designed to seat 250 people for banquet-style dinning and use high-quality operable partitions to create flexible space and multiple breakup meeting and conference rooms. The residential component (5225 North Highway 49) will construct 96 units of two-story workforce/residential housing targeting living-wage, single- and small-family households. The residential component will provide housing not only for hotel employees, but also for the community of Mariposa and Yosemite employees.

Based on information provided to JLB, the hotel component of the Project will undergo a General Plan/Area Plan/Zoning Map Amendment with the County of Mariposa in order to develop a larger hotel and conference center as the area south of the building area is not suitable for residential development without extensive grading. The residential development component will make up for the loss of planned residential units caused by the commercial zone expansion required for the hotel and conference center component. Figure 1 shows the location of the proposed Project site relative to the surrounding roadway network.

The purpose of this TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The Scope of Work was prepared via consultation with County of Mariposa and Caltrans staff.

Summary

The potential traffic impacts of the proposed Project were evaluated in accordance with the standards set forth by the Level of Service (LOS) policy of the County of Mariposa and Caltrans.

Existing (Base Year 2020) Traffic Conditions

- At present, all study intersections and segments operate at an acceptable LOS.

Opening Year 2022 plus Project Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the Project's vicinity. Implementation of the recommendations presented in more detail in the Project Access and Queuing Analysis discussions should improve onsite and offsite traffic operations and circulation to less than significant.
- The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 49 does not recommend a bicycle facility along State Route 49 adjacent to the proposed Project.
- At present, YARTs Merced Highway 140 Route runs on State Route 49 and Joe Howard Street approximately 0.30 miles east of the proposed Project site. YARTS has provided a letter of support for the Project and their intention to facilitate a convenient and safe bus stop at the Project site.
- At buildout, the proposed Project is estimated to generate a maximum of 2,904 daily trips, 156 AM peak hour trips, 148 MD peak hour trips, and 185 PM peak hour trips.
- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Cumulative Year 2025 plus Project Traffic Conditions

- The total trip generation for the Near Term Projects is 1,444 daily trips, 77 AM peak hour trips, 60 MD peak hour trips and 92 PM peak hour trips.
- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Cumulative Year 2040 plus Project Traffic Conditions

- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Queuing Analysis

- It is recommended that the County consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.
- In an effort to improve onsite and offsite traffic operations and circulation, it is recommended that the Project Driveway maintain a minimum throat depth of 75 feet before any vehicular openings to the west side of the parking lot.

Scope of Work

The TIA focused on evaluating traffic conditions at study intersections and segments that may potentially be impacted by the proposed Project. On January 29, 2020, a Draft Scope of Work for the preparation of a TIA for this Project was provided to County of Mariposa and Caltrans staff for their review and comment. JLB requested that comments to the Draft Scope of Work be provided no later than February 19, 2020.

On February 19, 2020, Caltrans responded to the Draft Scope of Work indicating a variety of comments/requests. On May 1, 2020, Caltrans provided further comments to the Scope of Work. On February 20, 2020, County of Mariposa responded and approved the Draft Scope of Work as presented. Based on the comments received from Caltrans and County of Mariposa staff, the TIA includes:

a) Traffic counts from Friday, September 7, 2018 expanded by an average annual growth rate of 0.83 percent for two (2) years to arrive at base year 2020 traffic volumes.
b) LOS evaluated using Synchro version 10. In addition to LOS, 95th Queue Length, Delay, and Measure of Effectiveness (MOEs) are provided for all study scenarios. The MOEs include Total Stops, Total Vehicle Hours of Delay, Vehicle Hours of Travel, Vehicle Miles Traveled, Total Vehicle Emissions, Total Fuel Consumption, and Average Speed.
c) Analysis for the intersections of State Route 140 and State Route 49 and proposed Project driveways to State Route 49.
d) Analysis for the segment of State Route 49 between Brown Bear Lane and Joe Howard Street.
e) A figure that illustrates the Project trip distribution to State facilities.
f) Time-of-day distribution details for the MD peak period trip generation rates.
g) Near Term Projects: Hampton Inn & Suites and Mariposa Family Apartments (5118 Fournier Road);

The Draft Scope of Work and the comments received from the lead agency and responsible agencies are included in Appendix A.

Study Facilities

The peak hour turning movement and segment volume counts were conducted at the study intersections and segments on Friday, May 8, 2020 and Friday, September 7, 2018, while schools in the vicinity of the proposed Project were in session. New traffic counts were collected from 7:00 AM to 9:00 AM to capture the AM peak hour, 11:00 AM to 2:00 PM to capture the Mid-Day (MD) peak hour, and 4:00 PM to 6:00 PM to capture the PM peak hour. The historical traffic count was collected from 7:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and 4:00 PM to 6:00 PM. The intersection turning movement counts included pedestrian and bicycle volumes.

To arrive at base year 2020 traffic volumes, historical counts from 2018 were expanded by an average annual growth rate of 0.83 percent for two (2) years to arrive at Base Year 2020 traffic volumes. To ensure reliability of new counts, JLB checked these against projected base year 2020 volumes. JLB found that the new counts were, in fact, lower than the projected volumes (from historical counts from 2018), and expanded the new counts by a ratio of 1.77, 1.13 and 1.43 for the AM, MD and PM peak volumes. New and historical peak hour turning movement and segment volume counts are contained in Appendix B. The projected base year 2020 intersection turning movement volumes, intersection geometrics and traffic controls are illustrated in Figure 2.

Study Intersections

1. Brown Bear Lane / State Route 49
2. Project Driveway / State Route 49
3. State Route 140 / State Route 49

Study Segments

1. State Route 49 between Brown Bear Lane and Project Driveway
2. State Route 49 between Project Driveway and Joe Howard Street

Study Scenarios

Existing (Base Year 2020) Traffic Conditions

This scenario evaluates the Existing (Base Year 2020) Traffic Conditions based on historical traffic volumes and roadway conditions from traffic counts and field surveys conducted in the year 2018. Traffic volumes from 2018 were expanded by an average annual growth rate of 0.83 percent for two (2) years to arrive at Base Year 2020 traffic volumes.

Opening Year 2022 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Opening Year 2022 plus Project Traffic Conditions. The Opening Year 2022 plus Project traffic volumes were obtained by adding a) normal background growth between the Existing (Base Year 2020) Traffic Conditions scenario and Opening Year 2022 and b) the Project Only Trips. Based on information provided by the developer, the Opening Year is projected to be around 2022. JLB expanded the Existing (Base Year 2020) traffic volumes by an average annual growth rate of 0.83 percent for two (2) years to present a conservative growth in traffic. The 0.83 percent average annual growth rate was approved by Caltrans to be utilized for the year 2040 since it is what has been historically observed along State Route 49 in the vicinity of the Project. The Project Only Trips to the study intersections were developed based on existing travel patterns, the existing roadway network, engineering judgment, existing residential and commercial densities, and the Mariposa County 2006 General Plan in the vicinity of the Project.

Cumulative Year 2025 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2025 plus Project Traffic Conditions. The Cumulative Year 2025 plus Project traffic volumes were obtained by adding a) the growth in traffic due to known cumulative projects or normal background growth between the Existing (Base Year 2020) Traffic Conditions scenario and Cumulative Year 2025, and b) the Project Only Trips. Under this scenario, the greater of the cumulative project traffic or the expanded Existing (Base Year 2020) traffic volumes by an average annual growth rate of 0.83 percent for five (5) years were utilized.

Cumulative Year 2040 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2040 plus Project Traffic Conditions. The Cumulative Year 2040 plus Project traffic volumes were obtained by expanding the Existing (Base Year 2020) traffic volumes by an average annual growth rate of 0.83 percent for 20 years.

Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from "A" to "F", with "A" indicating no congestion of any kind and "F" indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *2010 Highway Capacity Manual* (HCM) is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix C.

Criteria of Significance

The County of Mariposa has established LOS D as the acceptable level of traffic congestion on county roads and streets. Therefore, LOS D threshold was utilized to evaluate the potential significance of LOS impacts to Mariposa County intersections outside of Caltrans' jurisdiction.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the *Caltrans Guide for the Preparation of Traffic Impact Studies* dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Furthermore, the State Route 49 and State Route 140 Transportation Concept Reports have established LOS C as the concept LOS for State Route 49 and State Route 140 within the community of Mariposa. In this TIA, all study facilities fall within Caltrans' jurisdiction. Therefore, the Caltrans LOS C threshold was utilized as the criteria of significance for study facilities within Caltrans' jurisdiction.

Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- At existing intersections, the observed approach truck percentages are utilized under all study scenarios.
- The number of observed pedestrians at existing intersections are utilized under all study scenarios.
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Opening Year 2022 plus Project, and Cumulative Year 2025 plus Project scenarios.
- A PHF of 0.88, or the existing PHF if higher, is utilized in the Cumulative Year 2040 plus Project scenario.

Existing (Base Year 2020) Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

Brown Bear Lane is an existing north-south two-lane undivided local roadway that will serve the proposed Project. In this area, Brown Bear Lane extends southwest of State Route 49 for approximately 400 feet.

State Route 49 is an existing two-lane highway divided by a two-way left-turn lane adjacent to the proposed Project. State Route 49, also known as the Golden Chain Highway, travels along the western slope of the Sierra Nevada connecting communities from Oakhurst to Nevada City. State Route 49 south of Mariposa (referred to as State Route 49 South) travels in a southeasterly direction to Oakhurst in eastern Madera County and connects the populous eastern section of Mariposa County with State Route 140 and the San Joaquin Valley north of Merced via State Route 140. State Route 49 north of Mariposa (referred to State Route 49 North) is the access route to Mount Bullion (including the Mariposa-Yosemite Airport), Bear Valley, and the part of the County north of the Merced River. The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 49 designates State Route 49 west of State Route 140 as a two-lane conventional highway.

State Route 140 is an existing two-lane highway divided by a two-way left-turn lane in the vicinity of the proposed Project. West of Mariposa, State Route 140 is the main route to Merced and the Northern San Joaquin Valley for Mariposa travelers. East of Mariposa, State Route 140 is one of three (3) state routes into Yosemite National Park and experiences heavy tourism traffic including buses. There is also truck traffic which utilizes this highway to supply the commercial and industrial business of Mariposa and Yosemite National Park and provides access to Midpines community and the west Triangle Road area. The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 140 designates State Route 140 west and east of State Route 49 as a two-lane expressway.

State Route 49 and State Route 140 enter and exit Mariposa as separate highways, but they merge into one highway for approximately three-fourths (3/4) of a mile in the central section of Mariposa. State Route 49 South enters Mariposa in the Fairgrounds area and runs along Mariposa Creek until it intersects with State Route 140 near Third Street. State Route 140 from Merced travels along a bend of the western ridge as it enters Mariposa where it then intersects with State Route 49 South and continues in a northwesterly direction through the historic downtown area. State Route 140 between State Route 49 South and State Route 49 North generally follows the Charles Street right-of-way and bisects the town into two sections. Approximately 3/4 of a mile north of State Route 49 South, State Route 49 North begins traveling east, parallel to Mariposa Creek. State Route 140 continues northeast towards Yosemite National Park. The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 49 designates the segment of State Route 49 concurrent with State Route 140 as a two-lane conventional highway. The Transportation Concept Report for State Route 49 acknowledged that this segment would exceed LOS C as a two-lane conventional highway.

Traffic Signal Warrants

Traffic signal warrants 1, 2, 3, 4, 7 and 8, as appropriate, were prepared for the intersection of State Route 140 and State Route 49 in the Existing (Base Year 2020) Traffic Conditions scenario. These warrants are found in Appendix H. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of State Route 140 and State Route 49 satisfies signal warrants 1, 2 and 3 (during the MD and PM peak hour only). Based on the signal warrants and engineering judgement, signalization of this intersection is not recommended, especially since this intersection operates at an acceptable LOS during all peak periods. It is worth noting that the CA MUTCD states “satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal.”

Results of Existing (Base Year 2020) Level of Service Analysis

Figure 2 illustrates the Existing (Base Year 2020) Traffic Conditions turning movement and segment volumes, intersection geometrics and traffic controls. LOS and MOE worksheets for the Existing (Base Year 2020) Traffic Conditions scenario are provided in Appendix D. Table I presents a summary of the Existing (Base Year 2020) peak hour LOS at the study intersections, while Table II presents a summary of the Existing (Base Year 2020) LOS at the study segments.

At present, all study intersections and segments operate at an acceptable LOS.

Table I: Existing (Base Year 2020) Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*MD (11-2) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	Brown Bear Lane / State Route 49	One-Way Stop	10.9	B	10.5	B	10.3	B
2	Project Driveway / State Route 49	Does Not Exist	N/A	N/A	N/A	N/A	N/A	N/A
3	State Route 140 / State Route 49	All-Way Stop	13.2	B	13.6	B	15.9	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

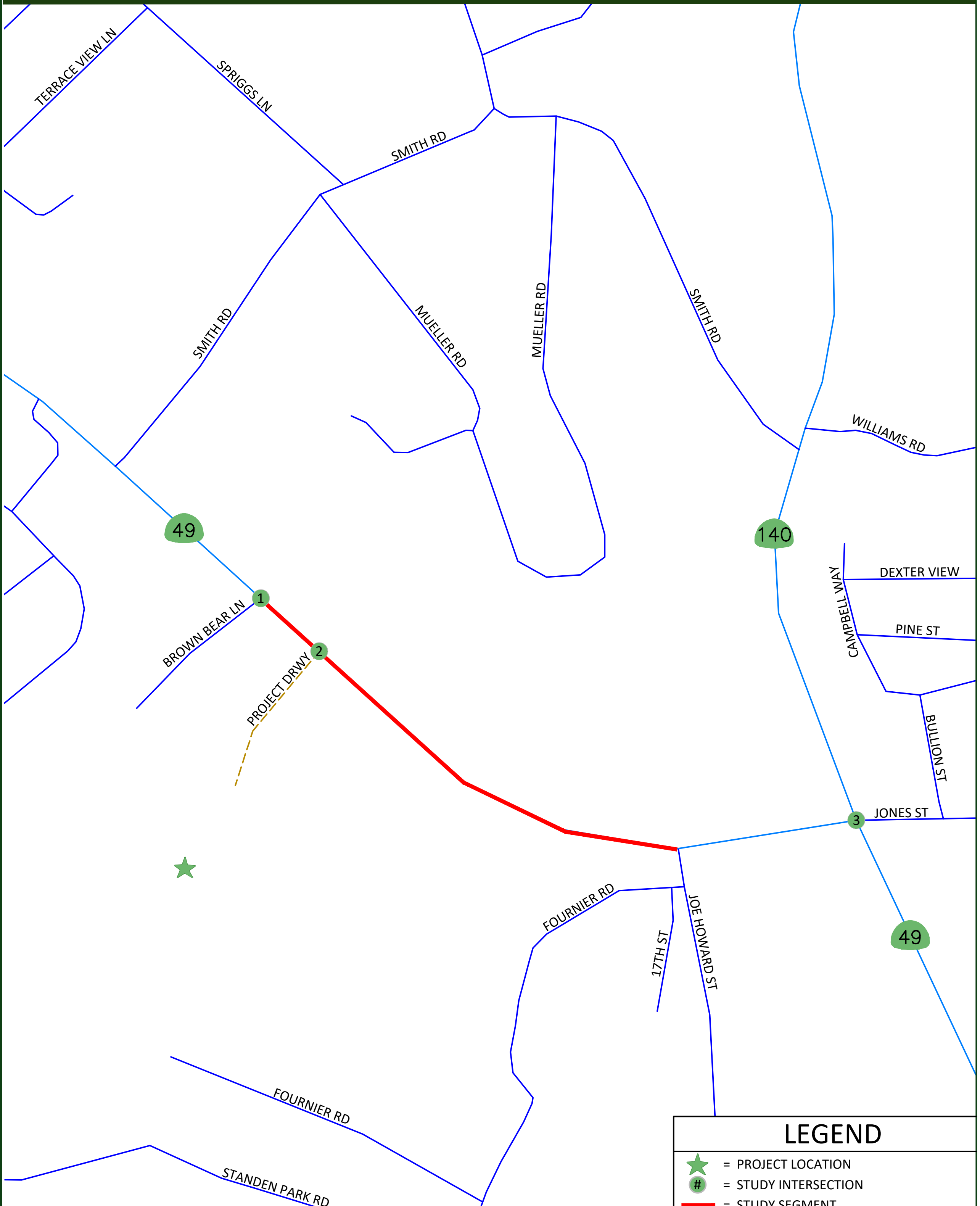
Table II: Existing (Base Year 2020) Segment LOS Results

ID	*Segment*	*Limits*	*Lanes*	*Daily Volume*	*LOS*
1	State Route 49	Brown Bear Lane and Project Driveway	2	6,148	C
2	State Route 49	Project Driveway and Joe Howard Street	2	6,148	C

Note: LOS = Level of Service per the Florida Roadway Segment LOS Tables within HIGHPLAN 2012

Hotel & Conference Center and Residential - County of Mariposa
Vicinity Map

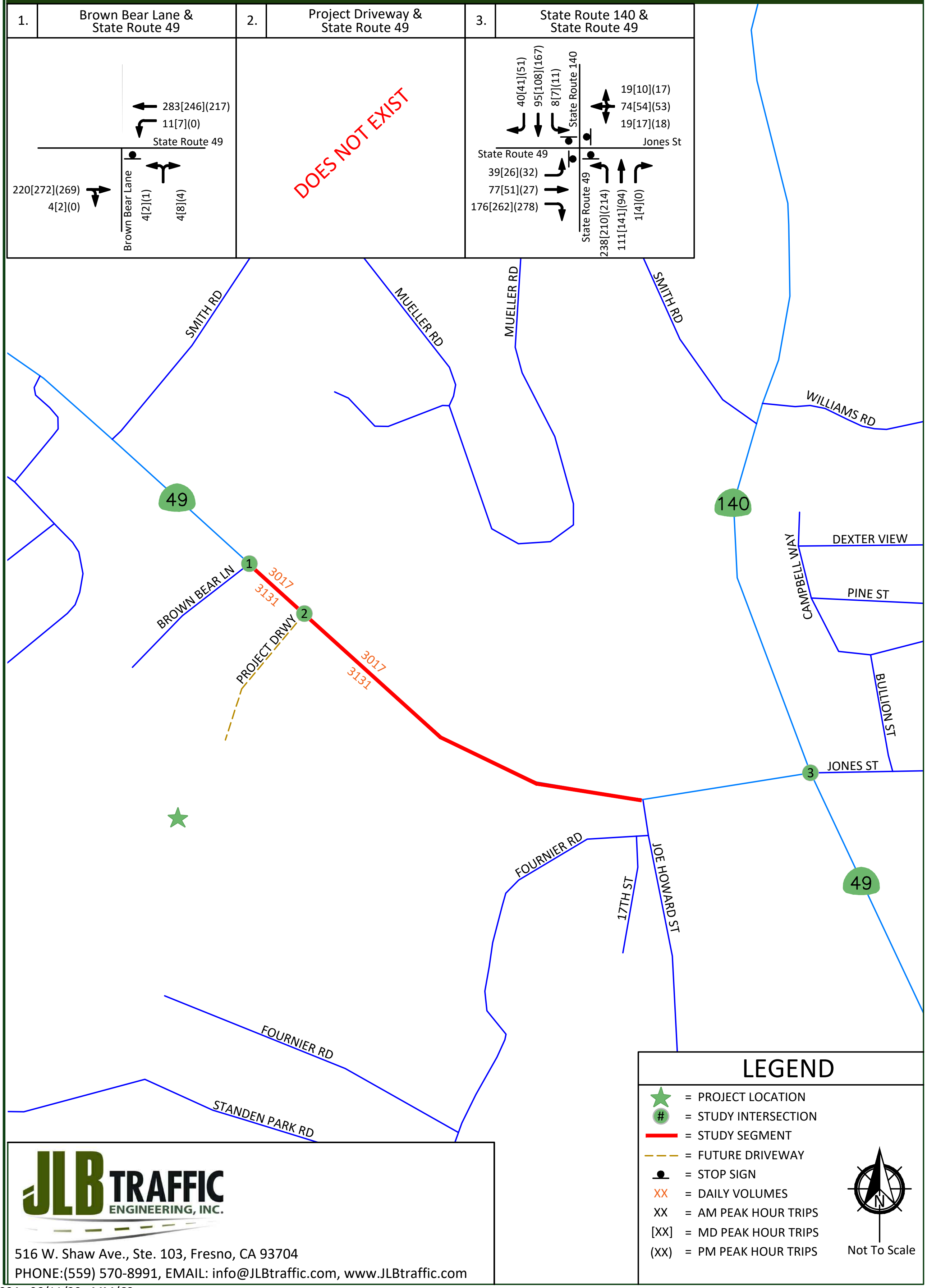
Figure 1



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

012-004 - 06/10/20 - CS

Hotel & Conference Center and Residential - County of Mariposa Figure 2
Existing (Base Year 2020) - Traffic Volumes, Geometrics and Controls



012-004 - 06/11/20 - MM/CS

Opening Year 2022 plus Project Traffic Conditions

Project Description

The Project proposes to be constructed in two phases. Phase I will develop a 180-room hotel with a conference center (Brown Bear Hotel and Yosemite Conference Center), while Phase II proposes to construct 96 units of multifamily housing (Residential Development). While the Project is planned for construction in phases, this TIA assumes full Project buildout.

The hotel component (4987 Brown Bear Lane) will provide 180 rooms including 126 standard rooms, 14 nightly suites, and 40 extended stay suites. The hotel will include a 5,000-square-foot conference center, a 1,800-square-foot restaurant (80 seats), a 1,426 square-foot lobby lounge (40 seats), a 575-square-foot fitness center, an outdoor pool, a garden area, an outdoor wedding venue, and an outdoor barbeque area. The conference center will be designed to seat 250 people for banquet-style dinning and use high-quality operable partitions to create flexible space and multiple breakup meeting and conference rooms. The residential component (5225 North Highway 49) will construct 96 units of two-story workforce/residential housing targeting living-wage, single- and small-family households. The residential component will provide housing not only for hotel employees, but also for the community of Mariposa and Yosemite employees.

Based on information provided to JLB, the hotel component of the Project will undergo a General Plan/Area Plan/Zoning Map Amendment with the County of Mariposa in order to develop a larger hotel and conference center as the area south of the building area is not suitable for residential development without extensive grading. The residential development component will make up for the loss of planned residential units caused by the commercial zone expansion required for the hotel and conference center component. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project Site Plan, access to and from the Project site will be from two (2) points located along the south side of State Route 49. One of the proposed access points is located at Brown Bear Lane along the south side of State Route 49 and is proposed to continue operating as a full access. The other is a proposed access point also located along the south side of State Route 49 approximately 250 feet east of Brown Bear Lane and is proposed as a full access.

JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the Project’s vicinity. Based on this review, it is recommended that access at Brown Bear Lane and the Project Driveway be designed to current Caltrans standards including, but not limited to, Chapter 200 of the Highway Design Manual (HDM). It is also recommended that the Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway and State Route 49. By incorporating these recommendations, onsite and offsite traffic operations and circulation should be improved to less than significant.

Bikeways

Currently, bike lanes do not exist in the vicinity of the proposed Project. The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 49 does not recommend a bicycle facility along State Route 49 adjacent to the proposed Project.

Transit

Mariposa County Transit (Mari-Go) is a General Public Dial-a-Ride, curb-to-curb service with designated route areas. Vehicle operation hours are Monday through Friday between 8:30 AM and 4:00 PM, except on County holidays. Riders must call in advance to schedule rides at (209) 966-5315. Transit services may be available for County-sponsored events and other community activities, such as the Mariposa County Fair, the Butterfly Festival, etc. However, arrangements must be made well in advance.

Mariposa County Transit also operates a curb-to-curb non-emergency medical transportation service, Medi-Trans, to seniors (60 years of age or older) for scheduled medical appointments and/or in-office procedures in Mariposa, Merced, Oakhurst, and Fresno. All transportation services are contingent on driver availability and weather conditions and may be cancelled at any time.

Yosemite Area Regional Transportation (YARTS) is the transit operator in the Yosemite Area. At present, there one (1) transit route that operates in the vicinity of the proposed Project. Merced Highway 140 runs on State Route 49 and Joe Howard Street approximately 0.30 miles east of the proposed Project site. Currently, its nearest stop to the Project site is at the Mariposa Park & Ride located on the east side of Joe Howard Street approximately 450 feet south of Fournier Road. Please visit the YARTS website at www.yarts.com to find the current schedule. This route provides a direct connection to Yosemite Valley and the City of Merced. It is worth noting that YARTS has provided a letter of support for the Project and their intention to facilitate a convenient and safe bus stop at the Project site. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Trip Generation

Trip generation rates for the proposed Project on a Friday were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). While the ITE Trip Generation Manual contains weekday vehicle trip generation rates for a Hotel per occupied room for the Daily, AM and PM peak periods, it does not provide a weekday vehicle trip generation rate per occupied room for the MD peak period. Therefore, JLB utilized the data contained within the time-of-day distribution along with the trip generation rates presented for the Daily, AM and PM peak periods to obtain the MD peak period trip generation rate. JLB appropriated the highest time-of-day distribution percent of daily traffic during the 60-minute period for the MD and PM peak periods (6.3 and 4.3, respectively) and used the PM peak period trip generation rate to calculate the MD peak period trip generation rate. Thus, the weekday MD peak period trip generation rate for a Hotel equals 0.64 [(0.73 × 6.3) ÷ 7.2 = 0.64]. The inbound and outbound split for the MD peak period was taken from the AM peak period split but reversed to reflect a greater percentage of trips departing.

In addition, the ITE Trip Generation Manual contains weekday vehicle trip generation rates for Multifamily Housing (Low-Rise) per dwelling unit for the Daily, AM and PM peak periods. It does not, however, provide a weekday vehicle trip generation rate per dwelling unit for the MD peak period. Therefore, JLB utilized the data contained within the time-of-day distribution along with the trip generation rates presented for the Daily, AM and PM peak periods to obtain the MD peak period trip generation rate. JLB appropriated the highest time-of-day distribution percent of daily traffic during the 60-minute period for the MD and PM peak periods (5.6 and 9.2, respectively) and used the PM peak period trip generation rate to calculate the MD peak period trip generation rate. Thus, the weekday MD peak period trip generation rate equals 0.34 [(0.56 × 5.6) ÷ 9.2 = 0.34]. The inbound and outbound split for the MD peak period was determined to be split evenly based on the assumption that all who travel home during the MD hour are traveling home for lunch and returning to work within the hour. Appendix E contains ITE's time-of-day distribution data for Hotel and Multifamily Housing (Low-Rise).

Table III presents the trip generation for the proposed Project with trip generation rates for a 180-room Hotel and 96 units of Multifamily Housing (Low-Rise). At buildout, the proposed Project is estimated to generate a maximum of 2,904 daily trips, 156 AM peak hour trips, 148 MD peak hour trips, and 185 PM peak hour trips.

Table III: Project Trip Generation - Friday

Land Use (ITE Code)	*Size*	*Unit*	*Daily*		*AM (7-9) Peak Hour*						*MD (11-2) Peak Hour*						*PM (4-6) Peak Hour*					
			Rate	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*
Hotel (310)	180	o.r.	12.23	2,201	0.62	58	42	65	47	112	0.64	42	58	47	68	115	0.73	49	51	64	67	131
Multifamily Housing (Low-Rise) (220)	96	d.u.	7.32	703	0.46	23	77	10	34	44	0.34	50	50	17	16	33	0.56	63	37	34	20	54
Total Project Trips				**2,904**				**75**	**81**	**156**				**64**	**84**	**148**				**98**	**87**	**185**

Note: o.r. = Occupied Rooms
d.u. = Dwelling Units

Trip Distribution

The trip distribution assumptions were developed based on existing travel patterns, the existing roadway network, engineering judgement, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the County of Mariposa General Plan Circulation, Infrastructure, and Services Element in the vicinity of the Project. Figure 4 illustrates the Project Only Trips to the study intersections and segments.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Opening Year 2022 plus Project Traffic Conditions scenario. These warrants are found in Appendix H. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of State Route 140 and State Route 49 satisfies the peak hour signal warrant during all peak periods. Based on the signal warrant and engineering judgement, signalization of this intersection is not recommended, especially since this intersection is projected to operate at an acceptable LOS during all peak periods. It is worth noting that the CA MUTCD states "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal."

Results of Opening Year 2022 plus Project Level of Service Analysis

The Opening Year 2022 plus Project Traffic Conditions scenario assumes that the existing roadway geometrics and traffic controls will remain in place. Figure 5 illustrates the Opening Year 2022 plus Project turning movement and segment volumes, intersection geometrics and traffic controls. LOS and MOE worksheets for the Opening Year 2022 plus Project Traffic Conditions scenario are provided in Appendix E. Table IV presents a summary of the Opening Year 2022 plus Project peak hour LOS at the study intersections, while Table V presents a summary of the Opening Year 2022 plus Project LOS at the study segments.

Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Table IV: Opening Year 2022 plus Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		MD (11-2) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Brown Bear Lane / State Route 49	One-Way Stop	11.7	B	11.8	B	11.7	B
2	Project Driveway / State Route 49	One-Way Stop	10.9	B	11.3	B	11.3	B
3	State Route 140 / State Route 49	All-Way Stop	15.7	C	15.9	C	20.7	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Table V: Opening Year 2022 plus Project Segment LOS Results

ID	Segment	Limits	Lanes	24-hour Volume	LOS
1	State Route 49	Brown Bear Lane and Project Driveway	2	6,969	C
2	State Route 49	Project Driveway and Joe Howard Street	2	8,274	C

Note: LOS = Level of Service per the Florida Roadway Segment LOS Tables within HIGHPLAN 2012

Hotel & Conference Center and Residential - County of Mariposa
Project Site Plan

Figure 3

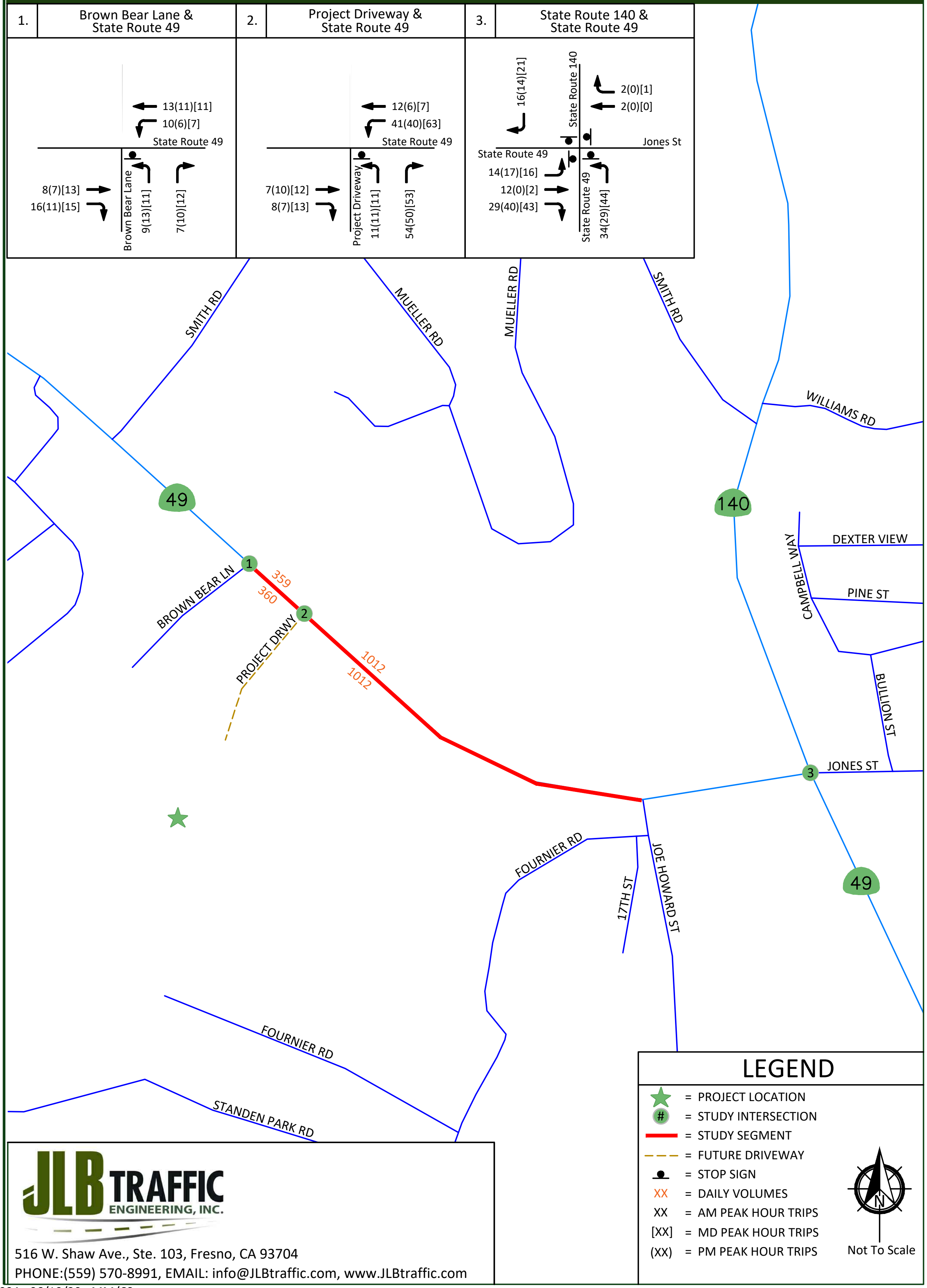
Not To Scale

JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Hotel & Conference Center and Residential - County of Mariposa

Figure 4

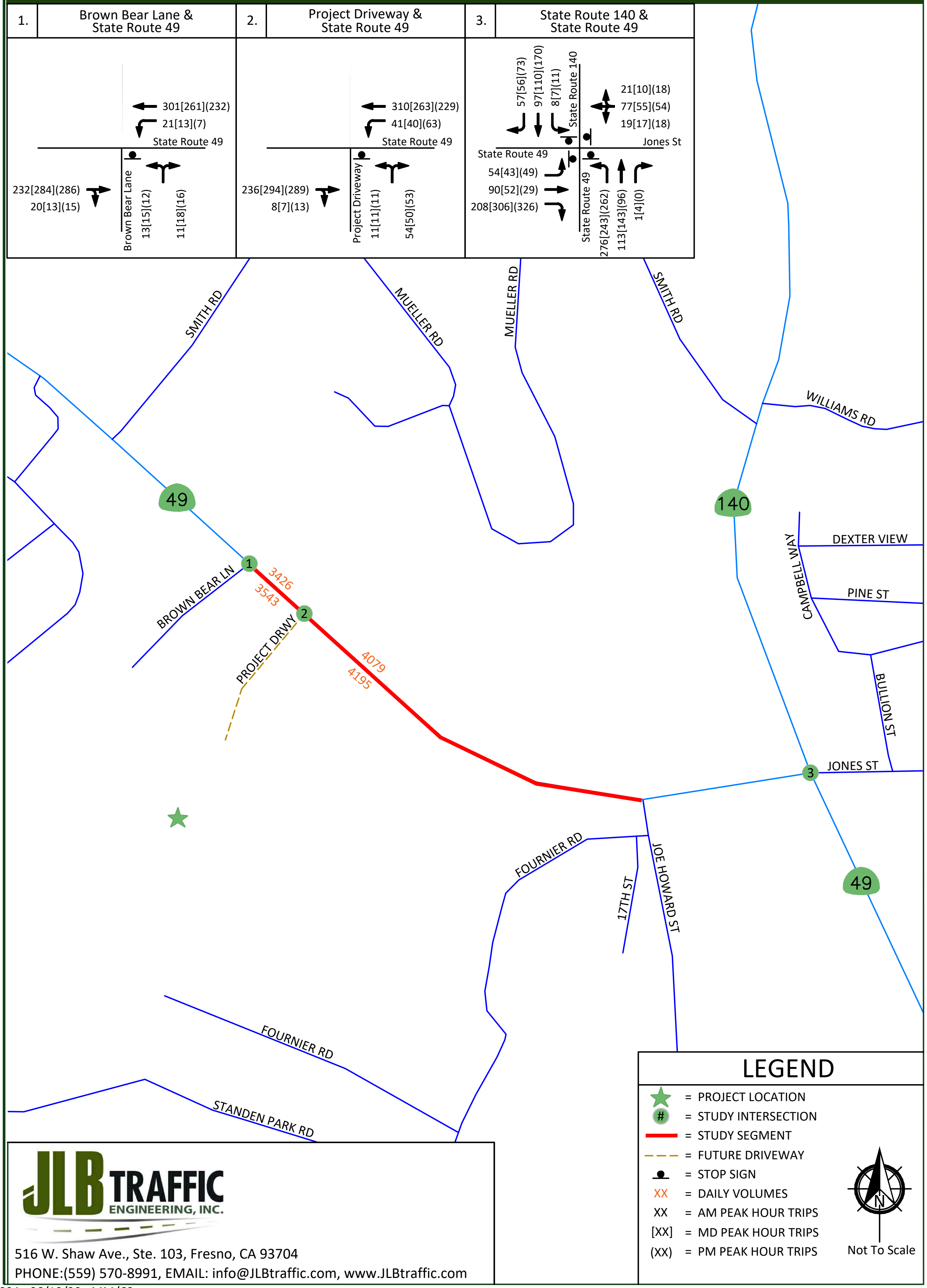
Project Only Trips



JLB TRAFFIC ENGINEERING, INC.

516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Hotel & Conference Center and Residential - County of Mariposa — Figure 5
Opening Year 2022 plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

012-004 - 06/10/20 - MM/CS

Cumulative Year 2025 plus Project Traffic Conditions

Description of Near Term Projects

Near Term Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. The County of Mariposa and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the projects listed in Table VI were approved, near approval, or in the pipeline within the proximity of the proposed Project.

The trip generation listed in Table VI is that which is anticipated to be added to the streets and highways by these projects between the time of the preparation of this report and three years after buildout of the proposed Project. As shown in Table VI, the total trip generation for the Near Term Projects is 1,444 daily trips, 77 AM peak hour trips, 60 MD peak hour trips and 92 PM peak hour trips. Figure 6 illustrates the location of the Near Term Projects and their combined trip assignment to the study intersections under the Cumulative Year 2025 plus Project Traffic Conditions scenario.

Table VI: Near Term Projects' Trip Generation

Approved Project Location	*Approved or Pipeline Project Name*	*Daily*	*AM (7-9) Peak Hour*	*MD (11-2) Peak Hour*	*PM (4-6) Peak Hour*
A	Mariposa Hampton Inn & Suites[1]	1,137	58	46	68
B	Mariposa Family Apartments[2]	307	19	14	24
Total Near Term Project Trips		**1,444**	**77**	**60**	**92**

Note: 1 = Trip Generation based on JLB Traffic Engineering, Inc. Traffic Impact Analysis Report
2 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2025 plus Project Traffic Conditions scenario. These warrants are found in Appendix H. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of State Route 140 and State Route 49 satisfies the peak hour signal warrant during all peak periods. Based on the signal warrant and engineering judgement, signalization of this intersection is not recommended, especially since this intersection is projected to operate at an acceptable LOS during all peak periods. It is worth noting that the CA MUTCD states "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal."

Results of Cumulative Year 2025 plus Project Level of Service Analysis

The Cumulative Year 2025 plus Project Traffic Conditions scenario assumes that the existing roadway geometrics and traffic controls will remain in place. Figure 7 illustrates the Cumulative Year 2025 plus Project turning movement and segment volumes, intersection geometrics and traffic controls. LOS and MOE worksheets for the Cumulative Year 2025 plus Project Traffic Conditions scenario are provided in Appendix F. Table VII presents a summary of the Cumulative Year 2025 plus Project peak hour LOS at the study intersections, while Table VIII presents a summary of the Cumulative Year 2025 plus Project LOS at the study segments.

Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Table VII: Cumulative Year 2025 plus Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		MD (11-2) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Brown Bear Lane / State Route 49	One-Way Stop	11.8	B	11.9	B	11.9	B
2	Project Driveway / State Route 49	One-Way Stop	11.0	B	11.4	B	11.4	B
3	State Route 140 / State Route 49	All-Way Stop	17.1	C	16.8	C	24.6	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

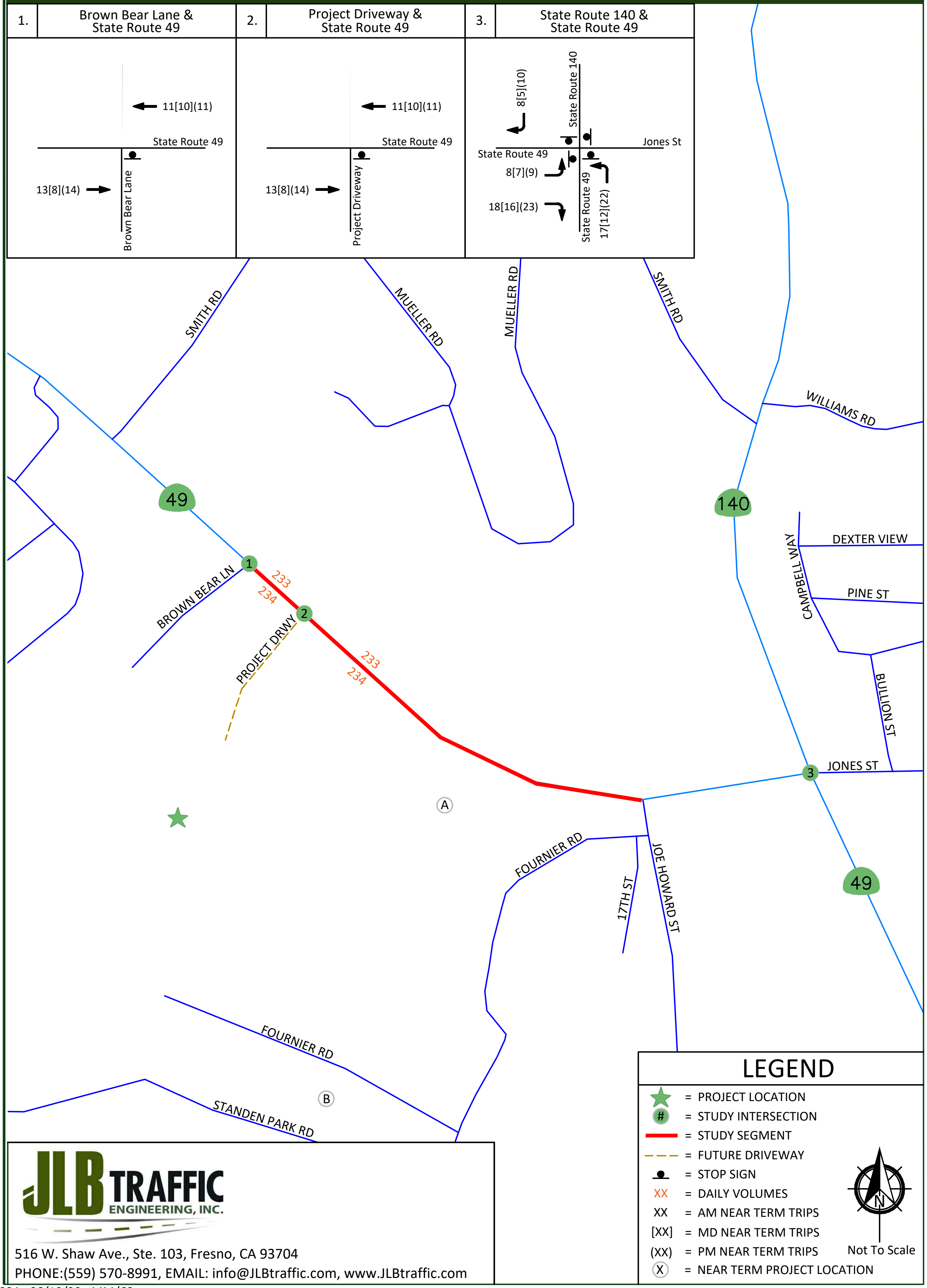
Table VIII: Cumulative Year 2025 plus Project Segment LOS Results

ID	Segment	Limits	Lanes	24-hour Volume	LOS
1	State Route 49	Brown Bear Lane and Project Driveway	2	7,334	C
2	State Route 49	Project Driveway and Joe Howard Street	2	8,639	C

Note: LOS = Level of Service per the Florida Roadway Segment LOS Tables within HIGHPLAN 2012

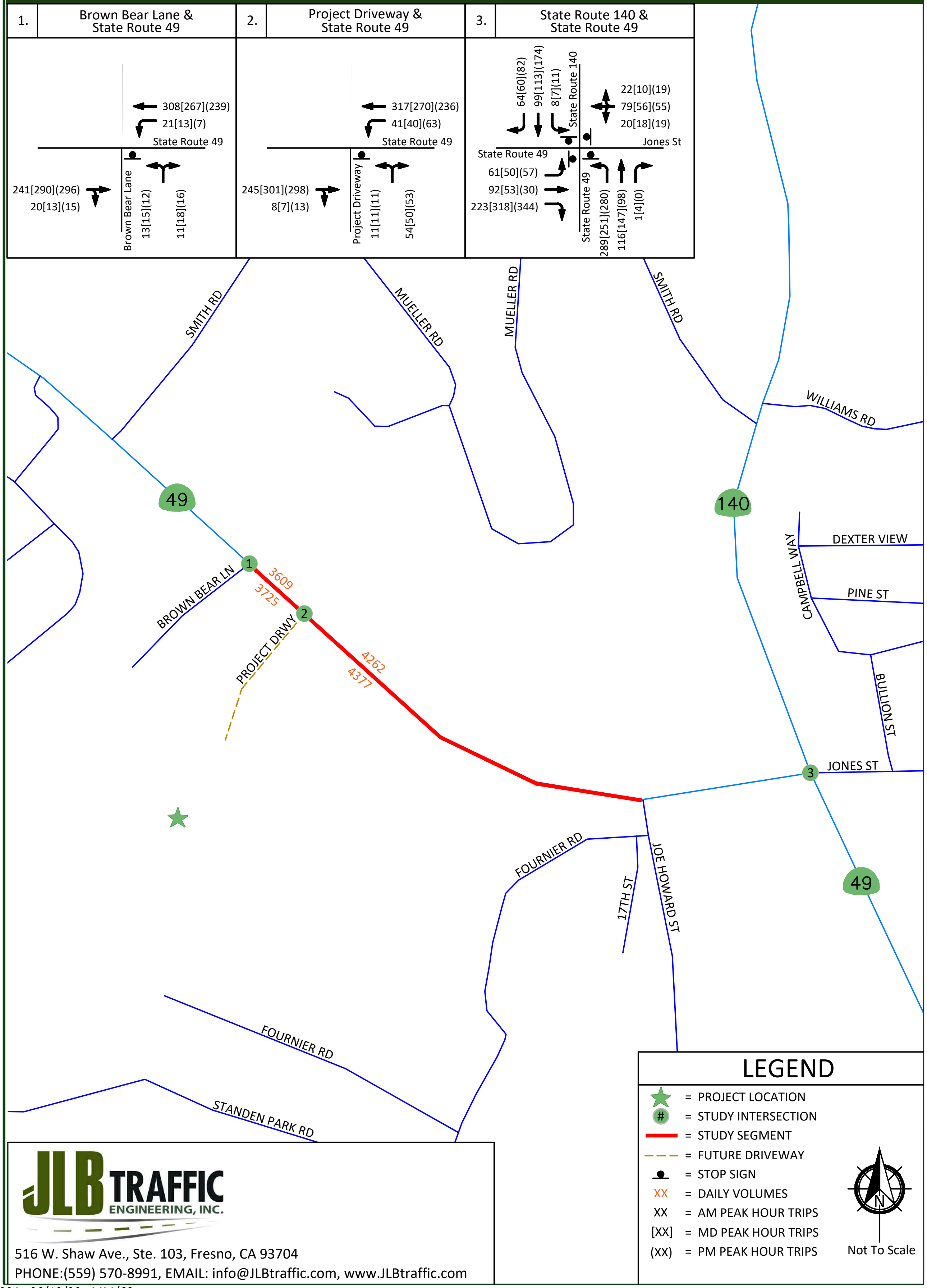
Hotel & Conference Center and Residential - County of Mariposa Near Term Project Trips' Assignment

Figure 6



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Hotel & Conference Center and Residential - County of Mariposa Figure 7
Cumulative Year 2025 plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Cumulative Year 2040 plus Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2040 plus Project Traffic Conditions scenario. These warrants are found in Appendix H. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of State Route 140 and State Route 49 satisfies the peak hour signal warrant during all peak periods. Based on the signal warrant and engineering judgement, signalization of this intersection is not recommended, especially since this intersection is projected to operate at an acceptable LOS during all peak periods. It is worth noting that the CA MUTCD states "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal."

Results of Cumulative Year 2040 plus Project Level of Service Analysis

The Cumulative Year 2040 plus Project Traffic Conditions scenario assumes that the existing roadway geometrics and traffic controls will remain in place. Figure 8 illustrates the Cumulative Year 2040 plus Project turning movement and segment volumes, intersection geometrics and traffic controls. LOS and MOE worksheets for the Cumulative Year 2040 plus Project Traffic Conditions scenario are provided in Appendix G. Table IX presents a summary of the Cumulative Year 2040 plus Project peak hour LOS at the study intersections, while Table X presents a summary of the Cumulative Year 2040 plus Project LOS at the study segments.

Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Table IX: Cumulative Year 2040 plus Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*MD (11-2) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	Brown Bear Lane / State Route 49	One-Way Stop	11.8	B	11.8	B	11.5	B
2	Project Driveway / State Route 49	One-Way Stop	11.2	B	11.7	B	11.7	B
3	State Route 140 / State Route 49	All-Way Stop	19.4	C	19.1	C	24.8	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

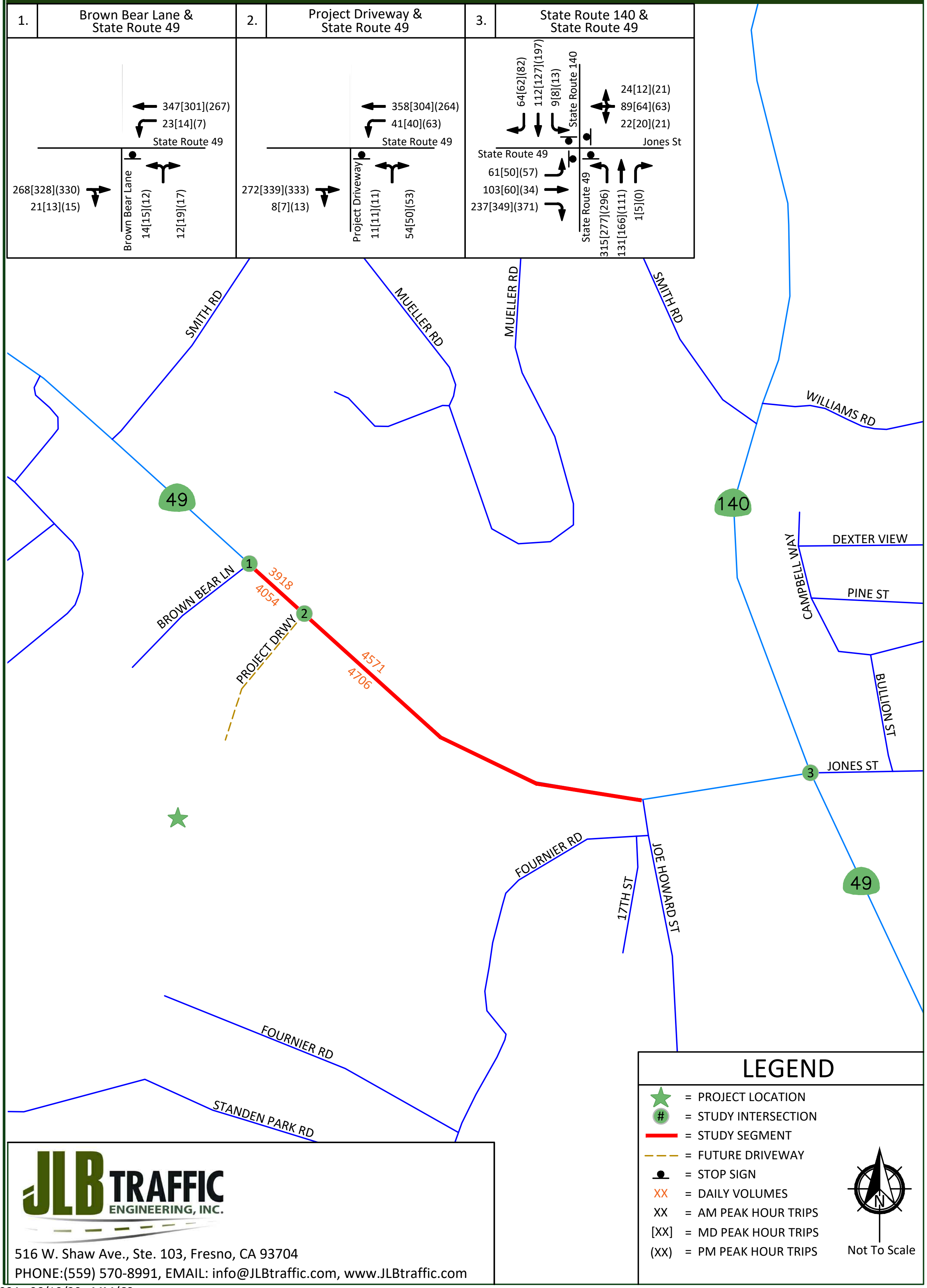
Table X: Cumulative Year 2040 plus Project Segment LOS Results

ID	*Segment*	*Limits*	*Lanes*	*24-hour Volume*	*LOS*
1	State Route 49	Brown Bear Lane and Project Driveway	2	7,972	C
2	State Route 49	Project Driveway and Joe Howard Street	2	9,277	C

Note: LOS = Level of Service per the Florida Roadway Segment LOS Tables within HIGHPLAN 2012

Hotel & Conference Center and Residential - County of Mariposa — Figure 8

Cumulative Year 2040 plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

012-004 - 06/10/20 - MM/CS

Queuing Analysis

Table XI provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the appendix for each respective scenario. Appendix C contains the methodologies used to evaluate these intersections. Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, "the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes." The queues shown on Table XI are the 95th percentile queue lengths for the respective lane movements.

The HDM provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, "tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane." Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table XI.

The storage capacity for the Cumulative Year 2040 scenario shall be based on the SimTraffic output files and engineering judgement. The values in bold presented in Table XI are the projected queue lengths that will likely need to be accommodated by the Cumulative Year 2040 scenario. At the remaining approaches, the existing storage capacity will be sufficient to accommodate the maximum queue.

- Project Driveway / State Route 49
    - In an effort to improve onsite and offsite traffic operations and circulation, it is recommended that the Project Driveway maintain a minimum throat depth of 75 feet before any vehicular openings to the west side of the parking lot.

Table XI: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing			Opening Year 2022 plus Project			Cumulative Year 2025 plus Project			Cumulative Year 2040 plus Project		
				AM	MD	PM	AM	MD	PM	AM	MD	PM	AM	MD	PM
1	Brown Bear Lane / State Route 49	EB T-R	>500	0	0	0	0	0	0	0	0	0	0	0	0
		WB L	TWLTL	10	0	0	21	22	0	23	20	10	18	19	0
		WB T	>500	0	0	0	0	0	0	0	0	0	0	0	0
		NB L-R	>300	27	30	22	39	42	37	39	40	41	42	38	42
2	Project Driveway / State Route 49	EB T-R	>500	*	*	*	0	0	0	0	0	0	0	0	0
		WB L	TWLTL	*	*	*	30	21	45	28	21	42	**39**	28	37
		WB T	>500	*	*	*	0	0	0	0	0	0	0	0	0
		NB L-R	*	*	*	*	51	45	52	55	51	55	56	48	60
3	State Route 140 / State Route 49	EB L	70	50	37	40	55	44	48	55	47	48	52	46	48
		EB T	>500	56	47	40	58	44	39	62	45	39	45	42	38
		EB R	70	64	68	76	74	94	105	94	77	103	83	102	**111**
		WB L-T-R	>300	65	55	52	67	50	51	65	44	58	79	54	55
		NB L	180	81	82	84	111	98	93	96	113	96	141	114	109
		NB T	>500	64	70	51	60	80	59	69	91	64	64	93	63
		NB R	70	0	0	0	0	0	0	0	0	0	0	0	0
		SB L	145	16	18	20	23	16	23	19	17	29	21	15	29
		SB T	>500	67	64	71	67	69	70	71	70	90	85	75	84
		SB R	120	0	0	0	0	0	0	0	0	0	41	39	0

Note: * = Does not exist or is not projected to exist
TWLTL = Two-Way Left-Turn Lane

Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- At present, all study intersections and segments operate at an acceptable LOS.

Opening Year 2022 plus Project Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the Project's vicinity. Implementation of the recommendations presented in more detail in the Project Access and Queuing Analysis discussions should improve onsite and offsite traffic operations and circulation to less than significant.
- The Caltrans Department of Transportation District 10 Transportation Concept Report for State Route 49 does not recommend a bicycle facility along State Route 49 adjacent to the proposed Project.
- At present, YARTs Merced Highway 140 Route runs on State Route 49 and Joe Howard Street approximately 0.30 miles east of the proposed Project site. YARTS has provided a letter of support for the Project and their intention to facilitate a convenient and safe bus stop at the Project site.
- At buildout, the proposed Project is estimated to generate a maximum of 2,904 daily trips, 156 AM peak hour trips, 148 MD peak hour trips, and 185 PM peak hour trips.
- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Cumulative Year 2025 plus Project Traffic Conditions

- The total trip generation for the Near Term Projects is 1,444 daily trips, 77 AM peak hour trips, 60 MD peak hour trips and 92 PM peak hour trips.
- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Cumulative Year 2040 plus Project Traffic Conditions

- Under this scenario, all study intersections and segments are projected to operate at an acceptable LOS.

Queuing Analysis

- It is recommended that the County consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.
- In an effort to improve onsite and offsite traffic operations and circulation, it is recommended that the Project Driveway maintain a minimum throat depth of 75 feet before any vehicular openings to the west side of the parking lot.

Study Participants

JLB Traffic Engineering, Inc. Personnel:

Jose Luis Benavides, PE, TE	Project Manager
Susana Maciel, EIT	Project Engineer
Matthew Arndt, EIT	Engineer I/II
Jove Alcazar, EIT	Engineer I/II
Carlos Ayala-Magana	Engineer I/II
Javier Rios	Engineer I/II
Jesus Garcia	Engineer I/II
Dennis Wynn	Sr. Engineering Technician
Christian Sanchez	Engineering Aide
Adrian Benavides	Engineering Aide
Justin Barnett	Engineering Aide
Michael McConnell	Engineering Aide

Persons Consulted:

Patricia Gilger	MRCC Properties, LLC
Steve Engfer	County of Mariposa
Gary Brown	County of Mariposa
Keasha Blew	County of Mariposa
Gregoria Ponce	Caltrans
Lloyd Clark	Caltrans

References

1. Mariposa County, *2006 General Plan*.
2. Mariposa Town Planning Area Specific Plan *General Plan*.
3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation,* 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. Highway Design Manual, 6th Edition, Caltrans, dated July 2, 2018.
7. Transportation Concept Report, State Route 49, Caltrans, District 10, dated July 2013.
8. Transportation Concept Report, State Route 140, Caltrans, District 10, dated June 2016.

Appendix A: Scope of Work

January 29, 2020

Mr. Steve Engfer
Senior Planner
County of Mariposa
5100 Bullion Street
Mariposa, CA 95338

Via Email Only: sengfer@mariposacounty.org

Subject: ***Draft Scope of Work for the Preparation of a Traffic Impact Analysis for the Brown Bear Hotel & Yosemite Conference Center located along the south side of State Route 49 in the County of Mariposa (JLB Project 012-004)***

Dear Mr. Engfer,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Project described below. The Project proposes to build a hotel with up to 200 rooms and a 2-story multifamily residential component with up to 120 units on the south side of State Route 49 at Brown Bear Lane in the County of Mariposa. Based on information provided to JLB, the Project will undergo a General Plan Amendment to modify a portion of the land use designated for Multifamily Residential to General Commercial. The proposed commercial development will preserve the natural landscape by leaving the southern half of parcel undeveloped. The proposed zone change and design will minimize environmental impacts thus protecting Mariposa Creek. An aerial of the Project vicinity is shown in Exhibit A, while the latest Project Site Plan is presented in Exhibit B.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures and identify any critical traffic issues that should be addressed in the on-going planning process. To evaluate the on-site and off-site traffic impacts of the proposed Project, JLB proposes the following Draft Scope of Work.

Scope of Work

- To arrive at the future year forecast volumes, JLB proposes to utilize an annual growth rate for State Route 49. Based on a review of the Annual Average Daily Traffic (AADT) volumes obtained from Caltrans, the 10-year average growth rate of State Route 49 is 0.83 percent. Therefore, JLB proposes to utilize an annual growth rate of 0.83 percent to expand the existing traffic volumes by 20 years to arrive at the Cumulative Year 2040 plus Project scenario.
- JLB will obtain recent (less than one year) or schedule and conduct new traffic counts at the study facility(ies), as necessary.
- JLB will perform a site visit to observe existing traffic conditions, especially during the AM and PM peak hours, and verify existing roadway conditions including lane geometrics and traffic controls.
- JLB will forecast trip distribution based on turn count information and knowledge of the existing and planned circulation network in the vicinity of the Project.

- JLB will qualitatively analyze existing and planned transit routes in the vicinity of the Project.
- JLB will qualitatively analyze existing and planned bikeways in the vicinity of the Project.
- JLB will prepare California Manual on Uniform Traffic Control Devices (CA MUTCD) Warrant 1 (8-hour), Warrant 2 (4-hour), Warrant 3 (peak hour), Warrant 4 (pedestrian peak hour), Warrant 7 (crash experience) and Warrant 8 (roadway network) for unsignalized study intersections under the Existing Traffic Conditions scenario.
- JLB will prepare CA MUTCD Warrant 3 (peak hour) for unsignalized study intersections under the Opening Year plus Project, Cumulative Year 2025 plus Project and Cumulative Year 2040 plus Project Traffic Conditions scenarios.
- JLB will evaluate existing and forecasted levels of service (LOS) at the study intersection(s). JLB will use HCM 2010 methodologies within Synchro to perform this analysis for the AM, MD and PM peak hours. JLB will identify the causes of poor LOS.
- JLB will evaluate on-site circulation and provide recommendations as necessary to improve circulation to and within the Project site.

Study Scenarios

1. Existing Traffic Conditions with proposed improvement measures (if any);
2. Opening Year plus Project (Buildout) Traffic Conditions with proposed mitigation measures (if any);
3. Cumulative Year 2025 plus Project (Buildout)Traffic Conditions with proposed mitigation measures (if any); and
4. Cumulative Year 2040 plus Project (Buildout) Traffic Conditions with proposed mitigation measures (if any).

Weekday peak hours to be analyzed (Friday Only)

1. 7 - 9 AM peak hour
2. 11 AM - 2 PM MD peak hour
3. 4 - 6 PM peak hour

Study Intersections

1. Brown Bear Lane / State Route 49

Queuing analysis is included in the proposed scope of work for the study intersection(s) listed above under all study scenarios. This analysis will be utilized to recommend minimum storage lengths for left-turn and right-turn lanes at all study intersections.

Study Segments

1. None

Project Only Trip Assignment to State Facilities

1. None

Project Trip Generation

Trip generation rates for the proposed Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table I presents the trip generation for the proposed Project with trip generation rates for Hotel and Multifamily Housing (Low-Rise). At buildout, the proposed Project is estimated to generate a maximum of 2,550 daily trips, 149 AM peak hour trips, 98 MD peak hour trips and 187 PM peak hour driveway trips.

Table I: Project Trip Generation

Land Use (ITE Code)	*Size*	*Unit*	*Daily*		*AM (7-9) Peak Hour*						*MD (11-2) Peak Hour*						*PM (4-6) Peak Hour*					
			Trip Rate	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*
Hotel (310)	200	o.r.	8.36	1,672	0.47	59	41	55	39	94	0.49	42	58	41	57	98	0.60	51	49	61	59	120
Multifamily Housing (Low-Rise) (220)	120	d.u.	7.32	878	0.46	23	77	13	42	55	0.00	0	0	0	0	0	0.56	63	37	42	25	67
Total Project Trips				**2,550**				**68**	**81**	**149**				**41**	**57**	**98**				**103**	**84**	**187**

Note: o.r. = Occupied Rooms
d.u. = Dwelling Units

Project Access

Access to and from the Project site is proposed from two (2) access points located along the south side of State Route 49. One is an existing full access, Brown Bear Lane, located approximately 600 feet southeast of Smith Road and is controlled by a one-way stop. The other access point is proposed to be located approximately 280 feet southeast of Brown Bear Lane and is also proposed as a full access. Additional Project details can be found in Exhibit B.

Near Term Projects to be Included

Based on our local knowledge of the study area and consultation with County of Mariposa staff, JLB proposes to include near term projects in the vicinity of the proposed Project under the Cumulative Year 2025 plus Project scenario. Near term projects proposed to be included are:

Project Name	General Location
1. Hampton Inn & Suites	SWQ Joe Howard Street and State Route 49

Other Near Term Projects the County or Caltrans has knowledge of and for which it is anticipated that said project(s) is/are projected to be whole or partially built by the Cumulative Year 2025, County and Caltrans, as appropriate, would provide JLB with near term project details. Near term project details include project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The above scope of work is based on our understanding of this Project and our experience with similar TIA Projects. In the absence of comments by February 19, 2020, it will be assumed that the above scope of work is acceptable to the agency(ies) that have not submitted any comments to the proposed TIA Scope of Work.

If you have any questions or require additional information, please contact me by phone at 559.317.6273 or by e-mail at smaciel@JLBtraffic.com.

Sincerely,

Susana Maciel

Susana Maciel
Project Engineer

cc: Mary Ann Avalos, Caltrans
Jose Luis Benavides, JLB Traffic Engineering, Inc.
Patricia Gilger, MRCC Properties, LLC

Exhibt A – Project Vicinity

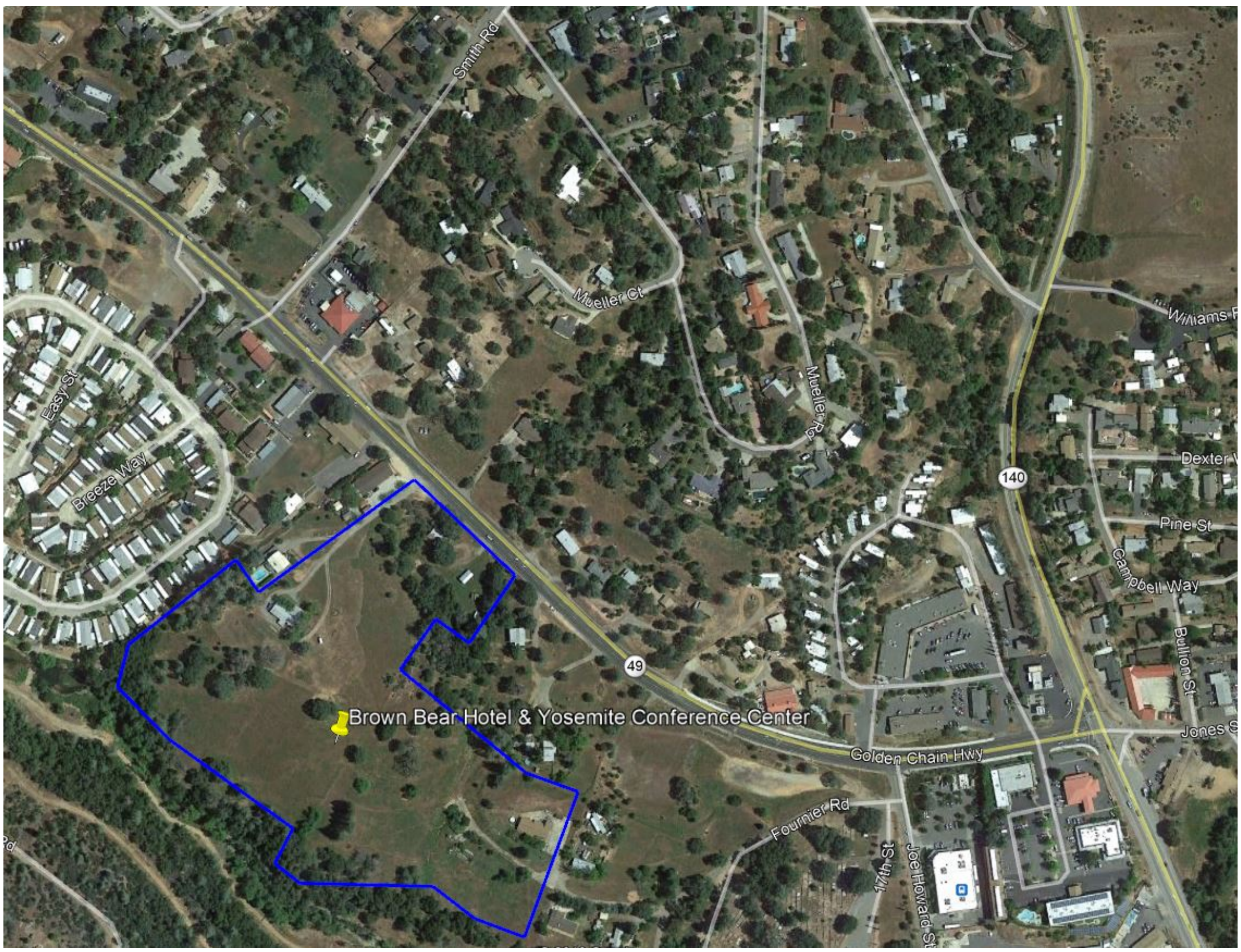
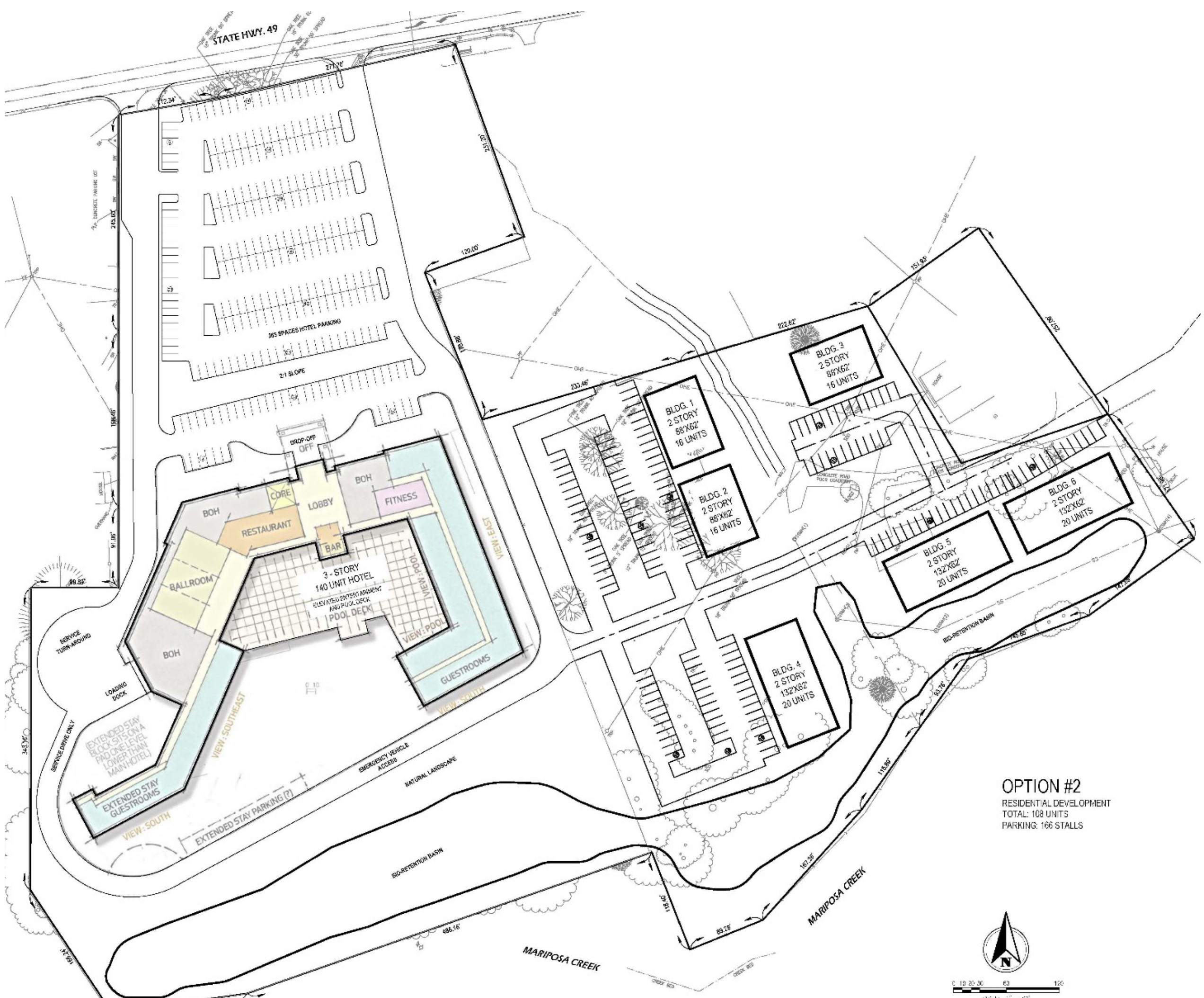
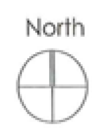


Exhibit B – Project Site Plan





Susana Maciel

From: Clark, Lloyd@DOT <Lloyd.Clark@dot.ca.gov>
Sent: Friday, May 01, 2020 3:07 PM
To: Susana Maciel
Cc: sengfer@mariposacounty.org; 'pgilger@mercymedtrans.com'; Gary Brown; Keasha Blew
Subject: FW: Response: MRCC TIA: Scope of Work JLB Comments
Attachments: ITE_Time_of_Day_Data.pdf

Hello Susana,

Caltrans has reviewed your e-mail request received on 4-24-20 stating JLB Traffic Engineering requests to utilize the previous Traffic Impact Analysis (TIA) from Friday, September 7, 2018 created by JLB on the Hampton Inn Project. Your request proposes that JLB utilize the Hampton Inn Friday counts for the Brown Bear Development Project (MPA-49-PM 18.859) and apply an average annual growth rate of 0.83 percent to expand volumes by two (2) years to arrive at base year 2020 traffic volumes.

After careful consideration and in relationship to the current Covid-19 pandemic, Caltrans agrees physical traffic counts (Friday and Saturday) would not present the typical peak hours condition desired at this time. We have determined using the Hampton Inn TIA dated September 7, 2018 with the proposed average annual growth rate of 0.83 percent will be accepted for the Brown Bear project without conducting an additional Friday and Saturday traffic count.

If you have further comments or questions please contact us.

Lloyd Clark
Transportation Planner
California Department of Transportation
District 10
1976 E, Dr. Martin Luther King Jr. Blvd
Stockton, Ca. 95202
209-941-1982
Lloyd.clark@dot.ca.gov

From: Susana Maciel <smaciel@jlbtraffic.com>
Sent: Friday, April 24, 2020 2:24 PM
To: Steve Engfer <sengfer@mariposacounty.org>; Ponce, Gregoria@DOT <gregoria.ponce@dot.ca.gov>
Cc: Clark, Lloyd@DOT <Lloyd.Clark@dot.ca.gov>; 'pgilger@mercymedtrans.com' <pgilger@mercymedtrans.com>; Gary Brown <gbrown@mariposacounty.org>; Keasha Blew <krblew@mariposacounty.org>
Subject: RE: Response: MRCC TIA: Scope of Work JLB Comments

EXTERNAL EMAIL. Links/attachments may not be safe.

Thank you Steve and Gregoria for allowing the use of historical counts.

JLB has already reached out to count firms to request historical counts for the study facilities on a Friday and Saturday. Unfortunately, the last and only counts for the area are from Friday, September 7, 2018. These are the counts that were used for the Hampton Inn Project. With that said, JLB intends on utilizing these Friday counts and applying an average annual growth rate of 0.83 percent to expand volumes by two (2) years to arrive at base year 2020 traffic volumes. Gregoria, can you please confirm that this approach is acceptable to Caltrans?

Lastly, Gregoria, I have included scans of ITE's (10th Edition) land use descriptions for Multifamily Housing (Low-Rise) and Hotel along with their corresponding time-of-day distribution data (presented in table format). The time-of-day distribution data provides a percent of the daily traffic occurring during the 60-minute period beginning at the time indicated.

Please feel welcome to contact me if I can be of any help. I can be reached by phone at 559.317.6273 or by email.

Best,

Susana Maciel

Traffic Engineering, Transportation Planning and Parking Solutions
Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

From: Steve Engfer <sengfer@mariposacounty.org>
Sent: Thursday, April 23, 2020 4:58 PM
To: Ponce, Gregoria@DOT <gregoria.ponce@dot.ca.gov>
Cc: Clark, Lloyd@DOT <Lloyd.Clark@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>; 'pgilger@mercymedtrans.com' <pgilger@mercymedtrans.com>; Gary Brown <gbrown@mariposacounty.org>; Keasha Blew <krblew@mariposacounty.org>
Subject: RE: Response: MRCC TIA: Scope of Work JLB Comments

Hello,

Thank you for the response Gregoria.

The suggested alternative method for counts in your comments (instead of this year's physical counts) presents a good opportunity for the project applicants to move forward with the study.

I copied JLB and the project applicant (and the County Engineer) on this email per our discussion earlier today with the intent that JLB and the applicant work through the remaining details with CALTRANS on the SOW and commenting below for the study.

We just ask that we are copied on the exchanges so we have a record.

I had a discussion with JLB (Susana) regarding the VMT qualitative methodology as well and the OPR guidance on VMT, in the event the CEQA document is not ready for circulation prior to July 1.

I expect that JLB will review the below comments and respond on any questions.

If there are any questions, please let me or Keasha know.

Thank you.

Steve Engfer
Senior Planner, Mariposa Planning
P.O. Box 2039 • 5100 Bullion Street Mariposa CA • 95338
(209) 742-1250 • Fax (209) 742-5024
sengfer@mariposacounty.org

www.mariposacounty.org/planning

From: Ponce, Gregoria@DOT [mailto:gregoria.ponce@dot.ca.gov]
Sent: Thursday, April 23, 2020 3:27 PM
To: Steve Engfer; Keasha Blew
Cc: Clark, Lloyd@DOT
Subject: Response: MRCC TIA: Scope of Work JLB Comments

Steve,

Thank you for the clarification and inquiries. Please see our responses in yellow highlight to your inquiries in ***bold italics***. We look forward to a continued successful partnership, reviewing studies and technical memoranda in assisting in this project moving forward.

Kind regards,

Gregoria Ponce
California Department of Transportation – D10
Chief, Office of Rural Planning
Office: 209.948.7325
Cell: 209.483.7234

From: Steve Engfer <sengfer@mariposacounty.org>
Sent: Wednesday, April 15, 2020 5:54 PM
To: Ponce, Gregoria@DOT <gregoria.ponce@dot.ca.gov>
Cc: Clark, Lloyd@DOT <Lloyd.Clark@dot.ca.gov>; Keasha Blew <krblew@mariposacounty.org>
Subject: RE: Response: MRCC TIA: Scope of Work JLB Comments

EXTERNAL EMAIL. Links/attachments may not be safe.

Hello,

Thank you for copying me on this response and the discussions.

Please see some clarifications and responses below in ***bold italics.***

Thank you!

Steve Engfer
Senior Planner, Mariposa Planning
P.O. Box 2039 • 5100 Bullion Street Mariposa CA • 95338
(209) 742-1250 • Fax (209) 742-5024
sengfer@mariposacounty.org

www.mariposacounty.org/planning

From: Ponce, Gregoria@DOT [mailto:gregoria.ponce@dot.ca.gov]
Sent: Tuesday, April 14, 2020 4:07 PM
To: Susana Maciel
Cc: Steve Engfer; Clark, Lloyd@DOT
Subject: Response: MRCC TIA: Scope of Work JLB Comments

Hello Susana,

Thank you for the opportunity to respond to your inquiries. Below please find our responses in **bold** in the body of your email of April 2020 regarding inquiries on the MRCC TIA. We also included our responses for which there were no initial JLB comments or inquiries.

Please let us know if you have any questions.

Kind regards,

Gregoria Ponce
California Department of Transportation – D10
Chief, Office of Rural Planning
Office: 209.948.7325
Cell: 209.483.7234

From: Ponce, Gregoria@DOT <gregoria.ponce@dot.ca.gov>
Sent: Thursday, April 02, 2020 4:59 PM
To: Susana Maciel <smaciel@jlbtraffic.com>
Cc: sengfer@mariposacounty.org
Subject: RE: MRCC TIA: Scope of Work Comments

Hi Susana,

Thank you for the below; we will confer on the data below and get back to you with an update.

Kind regards,

Gregoria Ponce
California Department of Transportation – D10
Chief, Office of Rural Planning
Office: 209.948.7325
Cell: 209.483.7234

From: Susana Maciel <smaciel@jlbtraffic.com>
Sent: Thursday, April 2, 2020 3:46 PM
To: Ponce, Gregoria@DOT <gregoria.ponce@dot.ca.gov>
Cc: Jose Benavides <jbenavides@jlbtraffic.com>; Patricia Gilger (pgilger@mercymedtrans.com) <pgilger@mercymedtrans.com>; sengfer (sengfer@mariposacounty.org) <sengfer@mariposacounty.org>; Keasha Blew <krblew@mariposacounty.org>
Subject: MRCC TIA: Scope of Work Comments

EXTERNAL EMAIL. Links/attachments may not be safe.

Good afternoon Gregoria,

I hope this email finds you well.

JLB has received comments on the Draft Scope of Work for the Brown Bear Hotel and Multifamily Residential Project located at 5242 Highway 49 in the community of Mariposa in Mariposa County. Below are some responses to the comments received from Caltrans on a letter dated February 19, 2020.

Caltrans Comment 1:
A minimum of two days, Friday and Saturday, traffic count is required. The traffic counts shall be conducted during the summer months.

JLB Response 1:
Assuming Caltrans' intent is that the TIA analyze the highest of the two days, JLB is able to provide supporting information for the collection of traffic counts on Friday only. Based on PeMS data for SR 140-W north of SR 49, volumes during the summer months of June and July 2019 were higher on Friday than on Saturday if you exclude results with missing data and holiday weekends, i.e. Fourth of July weekend. Please see an illustration of the results presented in Figure 1.

JLB also reviewed data for SR 140-W south of SR 49. Based on this review, volumes during the summer months of June and July 2019 were higher on Friday than on Saturday if you exclude results with missing data and holiday weekends, i.e. Fourth of July weekend. Please see an illustration of the results presented in Figure 2.

It is worth noting that JLB prepared the TIA for the Hampton Inn & Suites Hotel Project and also reviewed PeMS data for the same stations in August and September 2018. These results also showed that Friday observes the highest volume and JLB understands this to be historically true. JLB is confident that after review of the results presented in the figures, you will concur that only Friday counts are necessary.

Caltrans response:
Thank you for the response. We are requesting two days of traffic counts, Friday and Saturday, not the highest of two days. We agree the peak summer months are June and July.

Mariposa County Comment- Regarding New Physical Counts.

The COVID19 situation has impacted the traffic in Mariposa dramatically to which new physical counts would not be representative of the typical condition. It is suggested that an agreed upon methodology be achieved for projecting or modelling that does not involve new physical counts for this reason. Potentially previous year counts with a projected increase may be used in lieu. We simply don't know where things will be in June and July in relation to closures etc. For sure, we don't envision June or July to be representative of the typical traffic due to the impact to the tourist industry in Mariposa and nearby Yosemite.

In our lead agency capacity, we have prepared the draft initial study for the project and that is near completion. The traffic study is the key item needed to complete this. (We have a tentative timeline of republic hearings and project consideration at the Planning Commission an Board or Supervisors by end of June or sooner.)

It seems that physical counts this year are just not going to work with the COVID19 situation and its related impacts. And so in order to maintain a reasonable processing timeline and adhere to our responsibilities as lead agency, we recommend that the methodology be established which doesn't require physical counts and yet still meets an acceptable methodology standard.

Response (4-20-20)
We are agreed due to COVID 19 situation and shelter-in-place order, traffic pattern had been dramatically reduced in the region. Physical traffic counts would not present the typical peak hours condition. We suggest use previous year summer month traffic counts with projected growth rate factor.

Caltrans Comment 2:
LOS shall be conducted using Synchro version 10. Aside from LOS, Caltrans also requests for the 95th queue length, delay, and measures of effectiveness (MOE's) for all study scenarios. The MOE's shall include Total Stops, Total Vehicle Hours of Delay, Vehicle Hours of Travel, Vehicle Miles Traveled, Total Vehicle Emissions, Total Fuel Consumption, and Average Speed.

JLB Response 2:
JLB will JLB will evaluate existing and forecasted levels of service at the study intersections using HCM 2010 methodologies within Synchro version 10 to perform the analysis for the AM, MD and PM peak hours. A 95th percentile queue length analysis within SimTraffic will be utilized to recommend minimum storage lengths for left-turn and right-turn lanes at all study intersections. Analysis of the MOEs for all study scenarios is considered an unusual request. Can Caltrans help us understand why this is being requested?

Caltrans response: SB 743 CEQA requires a Traffic Impact Study (TIS) to evaluate Vehicles Miles Traveled (VMT) and Greenhouse Gas, Vehicle Emissions.

Mariposa County Comment- The intended timeframe for project entitlement processing would be completion prior to July. JLB may be providing this data although it may just be qualitative given the timeline and applicability.

Air/GHG emissions and related, are being analyzed and in relation to the project and its impacts including traffic in the initial study..

Response (4-20-20)
Under CEQA Guidelines, the Lead Agency can determine if VMT analysis is required based on the local development project timeline.

Caltrans Comment 3:
Where did MD (11-2) Peak Hour trip rate, in and out percent come from? Why is there no MD (11-2) Peak Hour trip rate, in and out percent for Multifamily Housing (Low-Rise)?

JLB Response 3:

Trip generation rates for the proposed Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). While the ITE Trip Generation Manual contains vehicle trip generation rates for a Hotel per occupied room for Daily, AM and PM peak periods, it does not provide vehicle trip generation rates per occupied room for the MD peak period. Therefore, JLB utilized the data contained within the time-of-day distribution along with the rates presented for the Daily, AM and PM peak periods to obtain the MD peak period rate. JLB took the highest time-of-day distribution percent of daily traffic during the 60-minute period for the MD and PM peak periods (6.3 and 4.3, respectively) and used the PM peak period trip rate to calculate the MD peak period trip rate. Thus, the MD peak period trip rate equals 0.64 [$(0.73 \times 6.3) \div 7.2 = 0.64$]. Therefore, JLB used a trip generation rate of 0.64 for the MD peak period of a Hotel. The inbound and outbound split for the MD peak period was taken from the AM peak period split and reversed to reflect a higher percentage of trip departing.

While the Trip Generation Manual contains vehicle trip generation rates for Multifamily Housing (Low-Rise) per dwelling unit for Daily, AM and PM peak periods, it does not provide vehicle trip generation rates per dwelling unit for the MD peak period. Therefore, JLB utilized the data contained within the time-of-day distribution along with the rates presented for the Daily, AM and PM peak periods to obtain the MD peak period rate. JLB took the highest time-of-day distribution percent of daily traffic during the 60-minute period for the MD and PM peak periods (5.6 and 9.2, respectively) and used the PM peak period trip rate to calculate the MD peak period trip rate. Thus, the MD peak period trip rate equals 0.34 [$(0.56 \times 5.6) \div 9.2 = 0.34$]. Therefore, JLB used a trip generation rate of 0.34 for the MD peak period of Multifamily Housing (Low-Rise). The inbound and outbound split for the MD peak period was determined to be split based on the assumption that all who travel home during the MD hour are traveling home for lunch and returning home.

Caltrans response:

JLB will need to clarify how the highest time-of-day distribution percent of daily traffic during 60 minutes period for the MD and PM peak periods 6.3, 4.3, and 7.2 for a Hotel and 5.6 and 9.2 for Multifamily Housing (Low-Rise) were calculated. Need to provide supporting data.

Study Intersections

- Add the intersections of SR 49/ SR 140/ Jones Street and proposed driveway located at SR 49.

JLB did not provide response to the above comment.

Caltrans response:

It is assumed that JLB will study the intersection of SR-49/SR 140/Jones Street and proposed driveway located at SR-49.

Study Segments

- The study segment that needs to be included in the (TIS) is SR 49 within the project limit.

JLB did not provide response to the above comment.

Caltrans response:

It is assumed that JLB will study SR-49 segment within the project limit.

Project Only Trip Assignment to State Facilities

- Provide a Figure to show project trip distribution in the TIS.

JLB did not provide response to the above comment.

<u>Caltrans response:</u>
It is assumed that JLB will provide Trip Distribution Figure in the TIS.

<u>Cumulative Year 2040 Plus Project Plus Approved Plus Pending</u>

- Hampton Inn & Suites

This project was approved (entitled) and appropriate for cumulative analyses.

- Jones Apartment

Mariposa County Comment- The "Jones Apartments" was a pre-application review, PREAPP 2019-088.

The pre-application resulted in communication of required items (see attached) <u>IF</u> the potential project were to move forward to a formal application process. The pre-application process is designed to provide input so applicants may then determine if they would like move to a land use entitlement (permit) application.

It has not moved forward to entitlement application step. We do not have a permit application in process or underway. I do not know if there will ever be an application submittal in the future. The pre-application does not result in a project for cumulative impact analyses purposes.

- Mariposa Family Apartments (5118 Fournier Road)

Mariposa County Comment- This project was approved (entitled) and appropriate for cumulative analyses.

- Motel Cottage

Mariposa County Comment- This project is a Design Review of exterior cosmetic changes and interior remodeling of an existing hotel (rebranding from the Monarch to "the cottages"). There is no increase in density or units as a part of the project, was or allowed. This is a project that is already a part of the baseline existing condition, and not a not appropriate for additional cumulative analyses for that reason.

JLB did not provide response to the above comment.

Response (4-20-20)
We concur Jones Apartment and Motel Cottage projects do not apply to Cumulative Year 2040 traffic analysis.

<u>Caltrans response:</u>
Previous Caltrans comment above still applies.

<u>Exhibit B – Project Site Plan (page 6)</u>

- The first parking space near the proposed driveway may need to be removed due to potential safety issue. Vehicle may be backing out into vehicle that is entering the proposed driveway.

JLB did not provide response to the above comment.

<u>Caltrans response:</u>
Previous Caltrans comment above still applies.

<u>Previous Comments (2/19/2020) General Plan Amendment still apply.</u>

- Complete Streets (CS) feature improvement shall be required along SR 49 and Brown Bear Lane.
- The proposed driveways shall be designed up to current Caltrans standard.
- An encroachment permit will be required for any work done within the State Right-of-Way.

JLB did not provide response to the above comments.

<u>Caltrans response:</u>
Previous Caltrans comments above still apply.

I appreciate your time and attention to this matter. Have a great day.

Best,

Susana Maciel

Traffic Engineering, Transportation Planning and Parking Solutions
Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
Direct: (559) 317-6273
Office: (559) 570-8991
Cell: (559) 232-9474
www.JLBtraffic.com

MARIPOSA PLANNING
COUNTY OF MARIPOSA
5100 BULLION STREET • POST OFFICE BOX 2039
MARIPOSA, CALIFORNIA 95338–2039
209 . 966 . 5151 • FAX 209 . 742 . 5024

Sarah Williams, Director
swilliams@mariposacounty.org
Keasha blew, Associate Planner
krblew@mariposacounty.org

February 20, 2020

APPLICANT: MRCC Properties, LLC
Attn: Rick Roesch
PO Box 1886
Mariposa, CA 95338

AGENT: Golden Valley Engineering
Attn: Jim Xu
405 West 19th Street
Merced, CA 95340

Re: General Plan/Specific Plan/Zoning Amendment (GP/SPZA) No. 2019-216 & Major Design Review (DR) No. 2020-008, Comments Received to Date

Greetings,

This letter provides the comments received to date for your project as a result of the initial "Send out for Comment" (SOFC) period which ended February 11, 2020. To date we have received comments from Cal Trans, Mariposa County Public Works, and Sierra Telephone. As other Departments' and Agency comments are received, we will provide those to you.

Attached for your reference are the letters from commenting agencies. We would like to draw your attention to the Cal Trans comments regarding the Traffic Study. There are also several comments regarding access and site grading which should be considered critical path items. These comments should not be considered an exhaustive list of elements to be considered. As stated previously, as the project is developed additional comments may arise. These comments will need to be addressed as well.

Also, as you are aware, we are still waiting for several additional items to complete your application packet. These additional items are referenced in a previous e-mail dated February 11, 2020 (Attached).

If you have any additional questions or need assistance please call me at 209-742-1220 or email me at krblew@mariposacounty.org.

Sincerely,

Keasha Blew
Associate Planner
Cc: file

DEPARTMENT OF TRANSPORTATION
DISTRICT 10
P.O. BOX 2048, STOCKTON, CA 95201
(1976 E. DR. MARTIN LUTHER KING JR. BLVD. 95205)
PHONE (209) 948-7325
FAX (209) 948-7164
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

February 19, 2020

Ms. Keasha Blew, Project Planner
County of Mariposa
Mariposa Planning Department
5100 Bullion Street
Mariposa, CA 95338-2039

MPA-49-PM 18.859
General Plan, Specific Plan, Zoning Amendment (GP/SPZA) 2019-216 and Design review (DR) 2020-008

Dear Ms. Blew,

The California Department of Transportation (Caltrans) appreciates the opportunity to review and comment on the application from MRCC Properties LLC & Sierra Train Homes, LLC. The proposed project is located on Assessor's Parcel Number 013-050-059, 013-050-060, located at 5243 Highway 49, in Mariposa. The following parcels 013-050-057, 013-050-008, 013-071-003 are unassigned. The project proponent proposes to change the land use designation of all of the 7.02-acre parcel (APN O 13-050-060) and a portion (0.18+/-acre) of a split zoned 0.39-acre parcel (APN 013-050-059) from Multi Family Residential to General Commercial in order to develop a 132,000 square foot (SF) hotel.

The project will provide 180 to 200 rooms, with a mixture of standard rooms, nightly suites, and extended stay suites (320 beds with a mix of doubled & singles/kings & suites), a 5,000 SF Conference Center that seats 250, 1,800 SF restaurant that seats 80, 1,426 SF lobby lounge that seats 40, 575 SF fitness center, outdoor pool, garden area, outdoor wedding venue, and an outdoor barbecue area. In addition, adjacent to the proposed hotel and conference center (parcels APN 013-050-008 & 013-071-003), the applicant plans to concurrently build six, 2-story multi-family housing units, targeting living wage renters to provide single and small family households options. The applicant is proposing approximately 100 to 120 residential units (140 beds with a mix of 1 & 2 bedrooms)

Caltrans has the following comments based on the General Plan Amendment, and Design Review:

Freeway & Highway Operations: A Traffic Impact Study (TIS) shall be submitted to Caltrans for review. The TIS shall provide the following information:

I. Level of Service (LOS), Delay, and 95th Queue Length by Movement Measure of Effectiveness
II. Analyze and provide Total Stop, Total Vehicle Hours of Delay, Vehicle Hours of Travel, Vehicle Miles Traveled, Total Vehicle Emissions, Total Fuel Consumption, and Average Speed.
III. Complete Streets (CS) feature improvements shall be required along Highway 49 within the project limit.
IV. The proposed driveways shall be design up to current Caltrans standard.

Hydrology: Ensure any grading and development will not significantly impact the existing State drainage facilities by the project:

I. Project will need to ensure no backwater will impact the existing State drainage facilities.
II. Any grading of these parcels should not redirect or increase any drainage flows into the State Right-of-Way.
III. The project is to retain any increase in runoff generated by this proposal.
IV. Additional review will be required once the drainage plans and calculations are submitted.

In addition, an Encroachment Permit will be required for any work done within the State Right-of-Way, if future developments are proposed, or construction activities that will encroach into Caltrans Right-of-Way, and an Encroachment Permit application be submitted to the Caltrans Permit Office. Please include California Environmental Quality Act (CEQA) documentation with supporting technical studies when submitting the Encroachment Permit. For more information please visit the Caltrans Website at;
https://dot.ca.gov/programs/traffic-operations/ep/applications

If you have any questions or would like to discuss these comments, please contact. Michael Casas at (209) 948-7475 (email: michael.casas@dot.ca.gov) or Gregoria Ponce at (209) 948-7325 (email: gregoria.ponce@dot.ca.gov).

Sincerely,

Gregoria Ponce, Chief
Office of Rural Planning

c: Sarah Williams, Planning Director, Mariposa County

DEPARTMENT OF TRANSPORTATION
DISTRICT 10
P.O. BOX 2048, STOCKTON, CA 95201
(1976 E. DR. MARTIN LUTHER KING JR. BLVD. 95205)
PHONE (209) 948-7325
FAX (209) 948-7164
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

February 19, 2020

Ms. Keasha Blew, Project Planner
County of Mariposa
Mariposa Planning Department
5100 Bullion Street
Mariposa, CA 95338-2039

MPA-49-PM 18.859
Draft Scope of Work
Traffic Impact Analysis (TIA)
Early Involvement

Dear Ms. Blew,

The California Department of Transportation (Caltrans) appreciates the opportunity to review and comment on the early draft scope of work for the Traffic Impact Analysis (TIA) for the Brown Bear Hotel and Multi Family residential housing units. The proposed project is located on Assessor's Parcel Number 013-050-059, 013-050-060, located at 5243 Highway 49, in Mariposa. The following parcels 013-050-057, 013-050-008, 013-071-003 are unassigned. The project proponent proposes to change the land use designation of all of the 7.02-acre parcel (APN O 13-050-060) and a portion (0.18+/-acre) of a split zoned 0.39-acre parcel (APN 013-050-059) from Multi Family Residential to General Commercial in order to develop a 132,000 square foot (SF) hotel.

The project will provide 180 to 200 rooms, with a mixture of standard rooms, nightly suites, and extended stay suites (320 beds with a mix of doubled & singles/kings & suites), a 5,000 SF Conference Center that seats 250, 1,800 SF restaurant that seats 80, 1,426 SF lobby lounge that seats 40, 575 SF fitness center, outdoor pool, garden area, outdoor wedding venue, and an outdoor barbecue area. In addition, adjacent to the proposed hotel and conference center (parcels APN 013-050-008 & 013-071-003), the applicant plans to concurrently build six, 2-story multi-family housing units, targeting living wage renters to provide single and small family households options. The applicant is proposing approximately 100 to 120 residential units (140 beds with a mix of 1 & 2 bedrooms)

Caltrans has the following comments based on the draft scope of work for the TIA:

Scope of Work

Statement: "*JLB will obtain recent (less than one year) or schedule and conduct new traffic counts at the study facility(ies), as necessary.*"
Caltrans Response: A minimum of two days, Friday and Saturday, traffic count is required. The traffic count shall be conducted during the summer months.

Statement: "*JLB will evaluate existing and forecasted levels of service (LOS) at the study intersection (s). JLB will use HCM 10 methodologies within Synchro to perform this analysis for the AM, MD and PM peak hours. JLB will identify the causes of poor LOS.*"
Caltrans Response: LOS shall be conducted using Synchro version 10. Aside from LOS, Caltrans also requests for the 95th Queue Length, Delay, and Measure of Effectiveness (MOE's) for all study scenarios. The MOE's shall include Total Stops, Total Vehicle Hours of Delay, Vehicle Hours of Travel, Vehicle Miles Traveled, Total Vehicle Emissions, Total Fuel Consumption, and Average Speed.

Study Intersections

- Add the intersections of SR 49/ SR 140/ Jones Street and proposed driveways / SR 49 to the study.

Study Segments

- The study segment that needs to be included in the TIA is SR 49 within the project limit.

Project Only Trip Assignment to State Facilities

- Provide a Figure to show project trip distribution in the TIA.

Project Trip Generation

- Where did MD (11-2) Peak Hour trip rate, in and out percent come from?
- Why is there no MD (11-2) Peak Hour trip rate, in and out percent for Multifamily Housing (Low-Rise)?

Cumulative Year 2040 Plus Project Plus Approved Plus Pending

- Hampton Inn & Suites
- Jones Apartment
- Mariposa Family Apartments (5118 Fournier Road)
- Motel Cottage

Exhibit B – Project Site Plan (page 6)

- The first parking space near the proposed driveway may need to be removed due to potential safety issue. Vehicle may be backing out into vehicle that is entering the proposed driveway.

Previous Comments for the General Plan Amendment still apply.

- Complete Streets (CS) feature improvement shall be required along SR 49 and Brown Bear Lane.
- The proposed driveways shall be designed up to current Caltrans standard.
- An encroachment permit will be required for any work done within the State Right-of-Way.

If you have any questions or would like to discuss these comments, please contact. Michael Casas at (209) 948-7475 (email: michael.casas@dot.ca.gov) or Gregoria Ponce at (209) 948-7325 (email: gregoria.ponce@dot.ca.gov).

Sincerely,

Gregoria Ponce, Chief
Office of Rural Planning

c: Sarah Williams, Planning Director, Mariposa County

Mariposa County
Department of Public Works

Roads – Parks & Recreation – Facilities - Airport
Engineering – Surveying – Transportation – Utility Operations
Fleet Maintenance – Solid Waste - Cemeteries

4639 Ben Hur Road
Mariposa, CA 95338
(209) 966-5356 office
(209) 966-2828 fax
www.mariposacounty.org

Team, Service, Stewardship

February 13, 2020

TO: Keasha Blew
FROM: Gary Brown, County Engineer
SUBJECT: DR 2020-008 Brown Bear Hotel and Yosemite Conference Center

---

1. The applicant is advised to instruct their engineering consultants to prepare a thorough conceptual grading plan early in the process. In the existing conditions, the subject property directs its runoff southerly, directly towards Mariposa Creek. It will be important to show that the proposed development does not increase runoff offsite, and does not negatively affect Mariposa Creek.

2. It appears that the initial project design is suggesting a single meandering bio-retention basin to accomplish the concerns noted in item 1 above. This location could be challenging to make it function as intended – considering the surrounding terrain and design elevations. An initial geotechnical investigation including percolation tests is advised. The design team should consider mitigating the developed site flow increases by other means – including mini-basins, underground storage, and pervious areas located strategically throughout the project site.

Thank you,

Gary Brown

RECEIVED
FEB 13 2020
Mariposa County Planning Department

Mariposa County
Department of Public Works

Airport – Cemeteries – Engineering – Facilities
Fleet Maintenance – Parks & Rec – Plant Operations
Roads – Solid Waste – Surveyor – Transportation

4639 Ben Hur Road
Mariposa, CA 95338
(209) 966-5356 office
(209) 966-2828 fax
www.mariposacounty.org

Team, Service, Stewardship

RECEIVED
FEB 13 2020
Mariposa County Planning Department

February 13, 2020

TO: Keasha Blew
FROM: Russ Marks, County Surveyor
SUBJECT: DR 2020-008 Brown Bear Hotel and Yosemite Conference Center

---

This is a supplement to the letter dated July 18, 2018 in response to the Site Review Application No. 2018-123 and is a preliminary review only. Subsequent plans are subject to additional review and comments.

This supplement is based on the plans dated December 2019 and submitted for the GP/SPZA 2019-2016 application.

Additional Information we will need in order to review as a complete plan include the following items:

These are general comments and in no particular order or importance.

- Parcels have different ownerships, to merge parcels for the project will dictate a single ownership. Any and all trustees/lenders also must be co-operative and in agreement. May require Modification of Deeds of Trust.
- The proposed project at build out has a potential for 1690 ADT's (plus the ADT for the Conference Center). Therefore the access for the project will need to be a Town Class IV road with parking and sidewalk. Will consider the waiver of parking along the main access if adequate parking is provided on-site.
- A Town Class IV road should have limited access points, therefore may require a redesign of the entrances to the parking areas. (mirror image flop of current).

Additional items also to consider and will need to be addressed or clarification:

- Maintain access existing access rights to all adjoining parcels.
- The 50' public road easement created by Parcel Map Book 25, Page 24 (PM25-24) was offered for dedication, yet rejected with prejudice reserving the right to accept at a later date. An equable solution which protects existing rights and preserves the intent of the Parcel Map.
- 15' PUE offered for dedication by PM 25-24 was accepted. Either the PUE needs to be left in place or relocated in a manner which protects existing rights and facilities.
- 40' public access offered for dedication by Document No. 924721 has not been accepted, yet rejected with prejudice reserving the right to accept at a later date.
- Sheet C0.1 delineates a strip easement along Hwy 49, What is it?

- APN 013-050-060 shows a Conditional Certificate of Compliance, if not already done need to resolve. May to show verification. May need to address conditions.
- Plan only indicates a portion of the existing sewer easement, plans need to show the entire easement.
- Caltrans encroachment approval is required.
- Need to provide a public access easement to Phase II, preliminary design does not appear to provide space to do so.
- Preferred access to Phase II should be along the east property line of Phase I, to avoid through traffic thru the parking areas.
- New access road should be named.
- Dead end Road lengths must be considered and mitigated.
- Option 3 of Phase II would be a preferred choice, with looped roads which offer more than one access point to the housing.
- Option 3 may require consideration of the Mariposa Creek flood plain. Flood zone should be delineated on the plans to verify if it is an issue or not.
- Waste management, service and delivery traffic patterns must be considered.
- How will grading affect access, drainage, etc. to adjoining lots?
- Existing overhead power lines on site. Leave in place or relocate? Potential easements issues.
- Possible existing well on 013-071-003. Does that serve offsite water to another parcel? Potential ownership rights issues. Easements?
- Appears to be a sewer clean out on 013-071-003, what does that serve? Is there an existing septic system to be mitigated?
- 013-050-009 & 013-050-059 likely have a well and septic system.
- Location of storm water retention system. Will it serve the front parking lot? Maintenance plan?
- Complete engineered site, grading and drainage plan will be required before final comments can be given.

SIERRA TELEPHONE

ESTABLISHED 1895

February 4, 2020

RECEIVED

FEB 10 2020

Mariposa County Planning Department

Mariposa County Planning
Attention: Keasha Blew
Post Office Box 2039
Mariposa, California 95338

RE: File No. 2019-216 & 2020-008 – MRCC Properties & Sierra Trail Homes

Dear Ms. Blew:

We have reviewed the proposed project known as Brown Bear Hotel and Yosemite Conference Center and the Multi-family Residential project referenced above and have the following comments:

1. We have multiple easements and cables on the project parcels. It appears that some of these cables may need to be relocated to accommodate the project. We request that the Developer contact us as early as possible to discuss any relocations and new easements that may be necessary.
2. We also have underground cables in the existing road right of way/public utility easement of Brown Bear Lane.
3. We have no other objections to the proposed application as long as our rights, as granted on recorded easements are not abridged.
4. It would be advantageous to the developer to contact Sierra Telephone prior to construction in order that we may coordinate the location of telephone facilities to serve the project. The developer will be responsible for providing the infrastructure for telephone facilities or paying for Sierra Telephone's cost to do so.

Please call me if you have any questions. I can be reached at 559-683-2493.

Thank you.

Sincerely yours,

Joe Ewing

Joe Ewing
Engineering Supervisor

JE/jt

This institution is an equal opportunity provider and employer

Keasha Blew

From: Keasha Blew
Sent: Tuesday, February 11, 2020 3:17 PM
To: Rick Roesch; 'Patricia Gilger'; jimxu@gves.us
Cc: Steve Engfer; Skip Strathearn
Subject: Brown Bear GPSPZA 2019-216/DR 2020-008 Coordination E-mail

Good Afternoon,

I wanted to reach out and thank you for the recent project submittals. We routed the "send out for comments" to participating agencies and departments prior to our Development Review team meeting last Wednesday. During the Development Review meeting discussion comments similar in nature to those received in 2018 for the preliminary site review were conveyed. Our Planning Project Team also conducted a preliminary site investigation on Monday which generated additional site specific comments. The intention of this email is to provide feedback to your team as a result of the of the Development Review meeting, initial review and our site visit and preemptively address any issues that may unintentionally require changes to the site layout or design and/or slow the process as the project moves into environmental review and staff report generation.

Critical Outside Agency and Department Items to Consider Critical path items to be coordinated with other agencies will consist of ensuring fire flow requirements are met, adequate access is provided, and civil design for grading, drainage and utilities are feasible. Because these items can hinder the project development process we recommend the following:

- Consultation with MPUD and CAL FIRE as soon as possible to discuss options for satisfying fire flow requirements. We recommend contacting Susan at MPUD at 209-966-2515 and Chief Morgan at 209-966-4330 to set up these discussions ASAP. (The fire related structural and site/design is within the context of the State Fire Marshall, MPUD would be the lead for consultation and also County Fire to compliment the key discussion points.)
- Contact Fire Chief Morgan (CAL FIRE) at 209-966-4330 to address all the access, and additional fire related issues, such as dead-end road length, hydrant locations and site improvements to meet state Public Resources Code Fire Safe requirements and local requirements as may be applicable..
  - A key consideration for Fire agency review of the project is the secondary access. Summarize the project's progress in obtaining a secondary, emergency egress roadway to Fournier Road. Such a roadway may be necessary in order to address state Fire Safe and applicable local requirements relating to dead-end road length.
- Pre and post conditions for site grading and hydrology (along with preliminary stormwater runoff design) will be necessary to determine which agencies will require environmental permitting. The environmental permitting process can be lengthy and may cause project delays or increased costs if not addressed early.
- Biological and Site Resources- please review the biological evaluation's reference to the ephemeral drainage on the site.

  *(*The bio study states that the drainage may be regulatory by the State Water Resources Control Board (SWRCB) and California Department of Fish and Wildlife. (CDFW). The County, as lead agency is charged with ensuring that outside agencies permitting requirements (as may be applicable) are met. It is typical that conditions of approval on projects may dictate requirements such as obtaining permits from an outside agency such as the SWRCB and/or CDFW.*

  Because outside agency permits may be required due to resources on the site, we are recommending that you elevate this issue for the project. Golden Valley Engineering may already be in consultation with the agencies regarding the potential biological and water site impacts, and if not, we recommend due consideration in that *regard. Outside agency permits have processing timeframes that could hinder your project advancing to meet your stated goals (timeline). Some permitting processes may take a year in and of themselves.*

Further, the permitting processes are designed to address potential impacts, such as to the on-site drainage, to inform the CEQA analysis and establish how mitigation could change the project and site design. Conclusion on this issue is important to the CEQA determination.)

- Provide preliminary civil sheets which include all proposed utility locations including fire hydrants, water lines, water storage, sewer connections, drainage and storm water retention.
  - Provide information on the nature of the proposed bio-retention basin which will be necessary for environmental review by applicable agencies.

Additional Planning Items to Consider

Our office have conducted preliminary reviews of the layout and developed a list of some high level issues that we recommend you consider in the development of your plans as you move forward:

- Accessibility – We recommend getting a CASP to sign off on any accessibility issues ASAP
- Pedestrian Routing –site pedestrian routes from parking lots, how will pedestrians circulate from the parking lots to the building?
- Traffic circulation for hotel, multi-family, and busses. An internal circulation and pedestrian plan
- Shade requirements and landscaping for parking lots. This is important because calculating landscaping and parking lot shade requirements will most likely impact site design.
- Locations of dumpsters and recycling for residential and hotel with sufficient accessibility for trucks to service.
- Sidewalk frontage requirements – Improvements of the frontage to include sidewalks are required for development of this scale
- Structure Elevations – This is a critical component of design review.
- Please also provide the following:

  Preliminary Title Reports for all of the parcels on the site. These will show parcel ownership and items such as easements, etc. that will be need to be addressed under final site design and review.

Additional Site Investigation Observations

- A well was identified on parcel 013-050-008. It appears to serve the neighboring parcel (013-071-001). These two parcels were previously a single parcel according to RS 1168.
- In some of the options the sewer easement appears to be in the bio-retention basin.
- There are at least 11 power poles on the site that may need to either be removed or relocated.
- There are 2 culverts exiting the headwall along Highway 49. One appears to be 24 inches rather than 18 inches. Please verify. Also, please insure that the pre and post project conditions stormwater calculations include all run-on calculation estimates and basis for which it was derived. This would include drainage map delineation of all non-project related water that enters this drainage.
- Cultural -There are remnants of a home (identified as Box-1) with adjacent out buildings on parcel 013-050-008 and what appeared to be a previously developed pad, near the transformer pole, located along the fence line between parcels 013-071-003 and 013-050-060 were not identified in your cultural report. Please request a determination by the author of report as to the historic significance (or lack thereof) of these areas within the project site.

If our office can assist you in accomplishing any of the previously mentioned tasks or if our attendance is requested at any of the coordination meetings please feel free to contact me directly at 209-742-1220.

Thank you

Keasha Blew
Associate Planner, Mariposa Planning
P.O. Box 2039 • 5100 Bullion Street Mariposa CA • 95338
(209) 742-1220 • Fax (209) 742-5024
krblew@mariposacounty.org

www.mariposacounty.org/planning

Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

Land Use	210 Single-Family Detached Housing						220 Multifamily Housing (Low-Rise)							
Setting	General Urban/Suburban						General Urban/Suburban						Dense Multi-Use Urban	
Time Period	Weekday		Saturday		Sunday		Weekday		Saturday		Sunday		Weekday	
Trip Type	Vehicle		Vehicle		Vehicle		Vehicle		Vehicle		Vehicle		Vehicle	
# Data Sites	6		2		1		10		1		1		1	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
12:00	0.3	5.5	0.9	7.6	1.0	6.8	0.7	5.4	0.0	8.0	0.0	12.3	0.0	5.0
12:15	0.3	5.6	0.7	8.8	1.0	9.4	0.7	5.3	0.0	10.6	0.0	12.3	0.0	4.6
12:30	0.2	5.8	0.6	9.3	0.5	9.9	0.6	5.2	0.0	11.7	0.0	12.3	0.0	4.2
12:45	0.2	6.1	0.7	8.5	1.0	7.3	0.5	4.9	0.0	9.6	0.0	10.3	0.0	3.8
1:00	0.2	6.0	0.5	8.2	1.0	7.8	0.4	4.6	0.0	7.4	0.0	12.3	0.0	5.0
1:15	0.2	6.1	0.5	7.7	1.0	4.7	0.3	4.9	0.0	3.2	0.0	8.9	0.0	7.3
1:30	0.2	6.2	0.4	6.8	0.5	5.2	0.3	5.0	0.0	2.1	0.0	8.2	0.0	8.0
1:45	0.1	6.2	0.4	8.2	0.0	6.3	0.3	5.6	0.0	3.7	0.0	8.2	0.0	8.8
2:00	0.1	6.6	0.4	8.6	0.0	4.2	0.3	5.7	0.0	5.3	0.0	8.2	0.0	8.0
2:15	0.1	6.8	0.4	9.2	0.0	4.2	0.4	5.7	0.0	5.9	0.0	8.2	0.0	7.6
2:30	0.1	6.7	0.4	9.4	0.0	3.6	0.4	6.3	0.0	5.3	0.0	6.2	0.0	7.6
2:45	0.1	7.1	0.4	9.3	0.0	2.6	0.3	5.9	0.0	5.9	0.0	6.2	0.0	6.5
3:00	0.2	7.2	0.6	10.0	0.5	5.2	0.4	6.2	0.0	5.9	0.0	3.4	0.4	7.3
3:15	0.2	7.7	0.9	8.2	0.5	7.3	0.3	6.5	0.0	6.9	0.0	5.5	0.4	6.1
3:30	0.3	8.5	0.8	8.6	0.5	8.9	0.4	6.4	0.0	5.9	0.0	6.8	0.4	6.9
3:45	0.5	8.9	0.8	7.2	0.5	11.5	0.6	7.0	0.0	5.3	0.0	6.2	0.4	7.3
4:00	0.6	9.0	0.6	6.2	0.0	9.9	0.6	7.6	0.0	5.9	0.0	6.2	0.4	6.9
4:15	0.7	8.9	0.2	7.0	1.0	9.9	0.7	8.1	0.0	6.4	0.0	2.7	0.4	6.5
4:30	1.0	8.9	0.5	7.3	1.6	9.9	0.8	8.8	0.5	9.0	0.7	4.1	0.4	6.1
4:45	1.0	8.9	0.6	7.7	2.1	10.4	1.0	9.2	1.1	8.5	1.4	6.2	1.1	5.7
5:00	1.2	8.8	0.9	8.0	2.1	11.5	1.3	9.1	1.1	10.1	1.4	7.5	0.8	6.1
5:15	1.6	8.6	1.1	7.4	1.6	10.4	1.6	9.2	1.1	10.1	1.4	8.9	2.3	6.9
5:30	2.0	8.3	0.9	6.5	1.0	9.4	1.9	9.0	0.5	9.6	0.7	8.9	3.1	7.3
5:45	2.9	7.9	0.9	5.9	1.0	6.8	2.4	8.2	0.0	11.2	0.7	6.2	4.6	8.4
6:00	3.8	7.2	0.9	5.4	1.6	7.3	2.9	7.9	1.1	8.5	1.4	4.8	5.0	9.2
6:15	4.5	6.7	1.2	5.6	1.0	6.8	3.8	7.2	2.1	6.4	2.7	4.8	5.0	9.5
6:30	5.4	6.0	1.5	5.3	1.6	7.3	4.9	6.6	2.1	4.8	2.7	3.4	6.9	8.4
6:45	6.2	5.6	1.9	5.9	2.1	8.9	6.3	6.4	2.1	3.7	2.1	3.4	8.0	6.9
7:00	6.7	5.2	1.9	5.6	2.1	6.8	7.4	5.7	2.7	2.7	1.4	3.4	11.1	5.0
7:15	7.3	5.0	2.5	5.8	3.1	6.3	7.7	5.4	1.6	4.3	2.7	4.1	9.9	4.6
7:30	7.1	4.8	3.5	5.8	3.6	5.7	7.7	5.4	1.6	4.8	4.1	2.7	8.8	3.8
7:45	6.6	4.7	3.8	5.4	3.6	4.2	6.9	4.9	2.7	4.3	6.2	2.7	7.3	3.8
8:00	6.2	4.7	4.3	5.0	3.1	5.2	6.3	5.1	1.6	3.7	6.8	2.7	4.6	5.7
8:15	5.7	4.5	4.7	3.6	2.6	4.2	6.0	4.8	2.7	4.8	6.2	0.7	5.0	3.8
8:30	5.1	4.3	4.0	3.2	3.1	2.6	5.6	4.1	4.3	4.3	6.2	1.4	3.8	6.9
8:45	4.9	3.7	4.8	2.8	2.1	1.6	5.5	4.1	4.3	3.2	4.8	1.4	3.1	8.8
9:00	4.3	3.4	5.2	2.1	3.6	0.0	5.3	3.6	6.9	3.7	6.2	0.7	2.7	6.9
9:15	4.1	2.8	5.4	2.2	5.2	0.0	5.1	3.6	9.0	2.7	5.5	2.1	2.7	8.0
9:30	4.4	2.3	6.0	2.1	6.3	0.0	4.6	3.6	10.1	3.2	5.5	1.4	3.4	5.0
9:45	4.4	2.0	7.3	1.5	10.9	0.5	4.1	3.3	12.2	4.3	8.9	2.1	4.2	3.1
10:00	4.8	1.6	7.9	1.3	12.5	0.5	4.0	2.9	9.6	3.7	10.3	2.7	4.6	2.3
10:15	5.0	1.3	8.1	0.9	13.0	0.5	4.3	2.2	7.4	2.1	11.6	1.4	4.2	1.5
10:30	5.0	1.2	7.7	0.9	11.5	0.5	4.7	1.8	6.4	2.7	11.6	1.4	3.1	1.1
10:45	5.2	1.2	6.2	0.8	9.4	0.0	5.2	1.4	5.9	1.6	8.9	0.7	1.9	0.8
11:00	5.2	1.0	6.5	1.4	7.3	0.0	5.3	1.2	10.6	1.6	8.2	0.0	1.9	1.5
11:15	5.3	0.8	6.5	1.4	6.3	0.0	5.3	1.0	11.2	1.6	10.3	0.0	3.1	0.8
11:30	5.4	0.7	7.2	1.5	5.7	1.0	5.2	0.8	11.2	0.0	11.6	0.0	4.2	0.8
11:45	5.4	0.4	7.9	1.3	6.3	1.0	5.4	0.7	10.6	0.0	13.7	0.0	5.0	0.8

Percent of Daily Traffic During the 60-Minute Period Beginning at Displayed Time

Land Use: 310
Hotel

Description

A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. All suites hotel (Land Use 311), business hotel (Land Use 312), motel (Land Use 320), and resort hotel (Land Use 330) are related uses.

Additional Data

Studies of hotel employment density indicate that, on the average, a hotel will employ 0.9 employees per room.[1]

Twenty-five studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 82 percent.

Some properties contained in this land use provide guest transportation services such as airport shuttles, limousine service, or golf course shuttle service, which may have an impact on the overall trip generation rates.

Time-of-day distribution data for this land use are presented in Appendix A. For the one center city core site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 a.m. and 3:15 and 4:15 p.m., respectively. On Saturday and Sunday, the peak hours were between 5:00 and 6:00 p.m. and 10:15 and 11:15 a.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, District of Columbia, Florida, Georgia, Indiana, Minnesota, New York, Pennsylvania, South Dakota, Texas, Vermont, Virginia, and Washington.

For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.

Trip generation at a hotel may be related to the presence of supporting facilities such as convention facilities, restaurants, meeting/banquet space, and retail facilities. Future data submissions should specify the presence of these amenities. Reporting the level of activity at the supporting facilities such as full, empty, partially active, number of people attending a meeting/banquet during observation may also be useful in further analysis of this land use.

Source Numbers

170, 260, 262, 277, 280, 301, 306, 357, 422, 507, 577, 728, 867, 872, 925, 951

---

[1] Buttke, Carl H. Unpublished studies of building employment densities, Portland, Oregon.

Percent of Daily Traffic During the 60-Minute Period Beginning at Displayed Time

Land Use	310 Hotel						311 All Suites Hotel	
Setting	Center City Core						General Urban/Suburban	
Time Period	Weekday		Saturday		Sunday		Weekday	
Trip Type	Vehicle		Vehicle		Vehicle		Vehicle	
# Data Sites	1		1		1		3	
	AM	PM	AM	PM	AM	PM	AM	PM
12:00	1.1	4.6	1.3	6.1	4.9	5.8	1.8	6.0
12:15	0.7	4.7	1.2	4.7	4.2	5.5	1.8	5.8
12:30	0.3	4.8	1.8	4.5	4.7	5.2	1.4	5.7
12:45	0.0	4.2	1.5	4.1	5.0	5.5	0.9	4.5
1:00	0.0	4.6	2.0	3.6	4.9	4.4	0.6	4.5
1:15	0.0	5.0	1.7	4.9	5.8	4.2	0.9	4.9
1:30	0.0	5.8	1.3	4.7	4.5	5.2	0.7	5.1
1:45	0.3	6.3	1.1	6.1	3.7	5.3	0.9	5.4
2:00	0.3	6.0	0.8	6.8	2.9	6.1	0.7	6.0
2:15	0.5	6.4	1.0	7.1	1.8	6.7	0.7	5.3
2:30	0.8	6.7	0.9	7.8	1.9	6.1	0.7	5.4
2:45	0.9	7.4	1.3	7.7	1.8	7.2	0.6	5.6
3:00	1.2	8.2	1.3	7.4	1.6	6.3	0.9	5.3
3:15	1.3	9.1	1.0	6.6	1.4	6.3	0.7	5.7
3:30	1.3	8.6	1.3	5.7	1.3	6.3	0.7	6.1
3:45	1.7	7.6	1.0	5.2	1.3	4.9	0.8	6.2
4:00	2.1	7.0	1.5	5.6	1.1	5.0	0.7	5.7
4:15	2.4	6.6	1.3	6.7	1.4	4.4	0.7	6.4
4:30	2.5	7.2	1.5	8.2	1.6	4.0	1.2	6.8
4:45	2.3	7.1	1.4	8.3	1.4	3.9	1.4	7.0
5:00	2.0	7.1	1.1	8.4	1.6	3.4	2.3	7.3
5:15	1.5	5.9	1.1	7.8	1.1	4.4	3.0	6.3
5:30	1.7	6.4	0.4	7.5	0.6	4.0	3.9	5.4
5:45	2.1	6.3	0.4	7.1	0.8	4.5	4.4	5.3
6:00	2.9	5.4	0.3	7.4	0.4	5.0	4.3	6.5
6:15	3.9	6.0	0.3	7.0	0.5	3.8	4.5	7.1
6:30	4.2	3.9	0.3	6.2	1.0	4.0	4.5	8.4
6:45	4.2	4.2	0.8	6.3	1.5	3.0	4.9	7.8
7:00	4.6	3.6	1.4	5.7	2.4	2.9	5.2	6.6
7:15	5.2	2.7	2.4	6.6	2.8	3.2	5.9	7.0
7:30	5.1	2.8	3.3	6.8	2.8	2.6	5.5	6.1
7:45	6.3	2.0	3.5	6.3	3.4	3.5	5.1	6.4
8:00	6.2	2.8	3.9	6.7	4.0	3.3	4.5	6.4
8:15	5.9	3.5	3.9	6.4	6.1	3.5	3.5	5.2
8:30	8.0	4.0	3.9	6.5	6.7	4.4	4.3	5.0
8:45	7.1	4.8	4.0	6.4	7.6	3.9	4.3	4.9
9:00	6.7	4.7	3.8	5.4	8.2	3.5	4.8	5.0
9:15	7.0	4.6	4.0	4.6	7.9	2.3	5.6	4.8
9:30	5.9	5.4	4.2	3.6	9.1	1.1	4.4	4.3
9:45	5.9	5.4	4.5	4.9	8.8	0.8	4.4	3.8
10:00	6.0	5.6	4.4	5.1	9.7	1.6	4.8	2.9
10:15	5.0	5.6	5.6	5.3	10.2	2.5	5.1	3.0
10:30	4.3	4.0	6.0	5.4	9.7	2.9	5.2	2.6
10:45	4.2	3.2	5.8	4.0	9.6	2.8	5.4	2.2
11:00	3.9	3.5	6.5	3.3	8.8	1.9	5.1	2.1
11:15	3.9	2.7	5.7	3.0	7.6	2.5	4.8	1.4
11:30	3.8	2.4	5.7	2.2	7.2	3.0	5.0	1.3
11:45	4.3	2.3	6.2	2.1	6.1	3.8	6.1	1.6

6.3

7.2

Appendix B: Traffic Counts

JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Brown Bear Ln at SR 49
Site Code : 00000000
Start Date : 5/8/2020
Page No : 1

Groups Printed- Unshifted - Bank 2

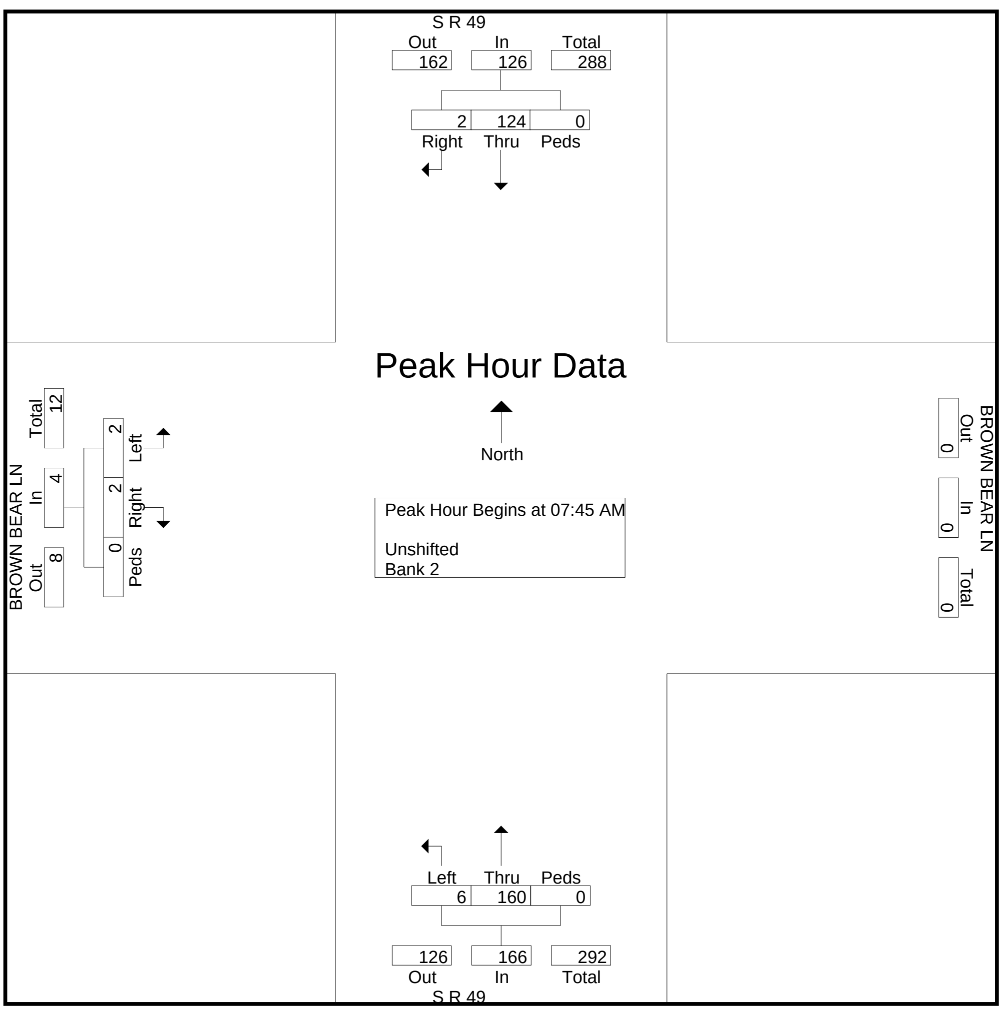
	S R 49 Southbound			S R 49 Northbound			BROWN BEAR LN Eastbound			
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Int. Total
07:00 AM	19	0	0	0	22	0	0	0	0	41
07:15 AM	17	0	0	0	27	0	0	0	0	44
07:30 AM	14	0	1	0	35	0	0	0	0	50
07:45 AM	27	0	0	2	49	0	1	0	0	79
Total	77	0	1	2	133	0	1	0	0	214
08:00 AM	33	0	0	0	48	0	0	0	0	81
08:15 AM	27	2	0	2	32	0	1	0	0	64
08:30 AM	37	0	0	2	31	0	0	2	0	72
08:45 AM	32	0	0	2	37	0	0	2	0	73
Total	129	2	0	6	148	0	1	4	0	290
******										
11:00 AM	37	0	1	0	43	0	1	1	0	83
11:15 AM	39	0	1	2	50	0	1	0	0	93
11:30 AM	43	0	0	2	43	0	0	2	0	90
11:45 AM	58	1	0	6	51	0	2	3	0	121
Total	177	1	2	10	187	0	4	6	0	387
12:00 PM	71	1	0	0	53	0	0	2	0	127
12:15 PM	64	0	1	0	64	0	0	1	0	130
12:30 PM	48	0	1	0	50	0	0	1	0	100
12:45 PM	47	0	0	1	52	0	1	0	0	101
Total	230	1	2	1	219	0	1	4	0	458
01:00 PM	47	0	3	1	51	0	0	1	0	103
01:15 PM	50	0	0	0	44	0	0	1	0	95
01:30 PM	43	1	0	1	44	0	1	0	0	90
01:45 PM	45	0	0	4	47	0	0	2	0	98
Total	185	1	3	6	186	0	1	4	0	386
******										
04:00 PM	33	0	0	1	43	0	0	0	0	77
04:15 PM	46	0	0	0	32	0	0	3	0	81
04:30 PM	46	0	0	0	40	0	1	0	0	87
04:45 PM	42	0	0	0	34	0	0	0	0	76
Total	167	0	0	1	149	0	1	3	0	321
05:00 PM	54	0	0	0	46	0	0	0	0	100
05:15 PM	37	0	0	1	37	0	0	0	0	75
05:30 PM	39	0	0	0	30	0	1	0	0	70
05:45 PM	34	0	0	0	28	0	0	0	0	62
Total	164	0	0	1	141	0	1	0	0	307
Grand Total	1129	5	8	27	1163	0	10	21	0	2363
Apprch %	98.9	0.4	0.7	2.3	97.7	0	32.3	67.7	0	
Total %	47.8	0.2	0.3	1.1	49.2	0	0.4	0.9	0	
Unshifted	1128	5	8	27	1160	0	10	21	0	2359
% Unshifted	99.9	100	100	100	99.7	0	100	100	0	99.8
Bank 2	1	0	0	0	3	0	0	0	0	4
% Bank 2	0.1	0	0	0	0.3	0	0	0	0	0.2

JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Brown Bear Ln at SR 49
Site Code : 00000000
Start Date : 5/8/2020

	S R 49 Southbound				S R 49 Northbound				BROWN BEAR LN Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	27	0	0	27	**2**	**49**	0	**51**	**1**	0	0	1	79
08:00 AM	33	0	0	33	0	48	0	48	0	0	0	0	**81**
08:15 AM	27	**2**	0	29	2	32	0	34	1	0	0	1	64
08:30 AM	**37**	0	0	**37**	2	31	0	33	0	**2**	0	**2**	72
Total Volume	124	2	0	126	6	160	0	166	2	2	0	4	296
% App. Total	98.4	1.6	0		3.6	96.4	0		50	50	0		
PHF	.838	.250	.000	.851	.750	.816	.000	.814	.500	.250	.000	.500	.914

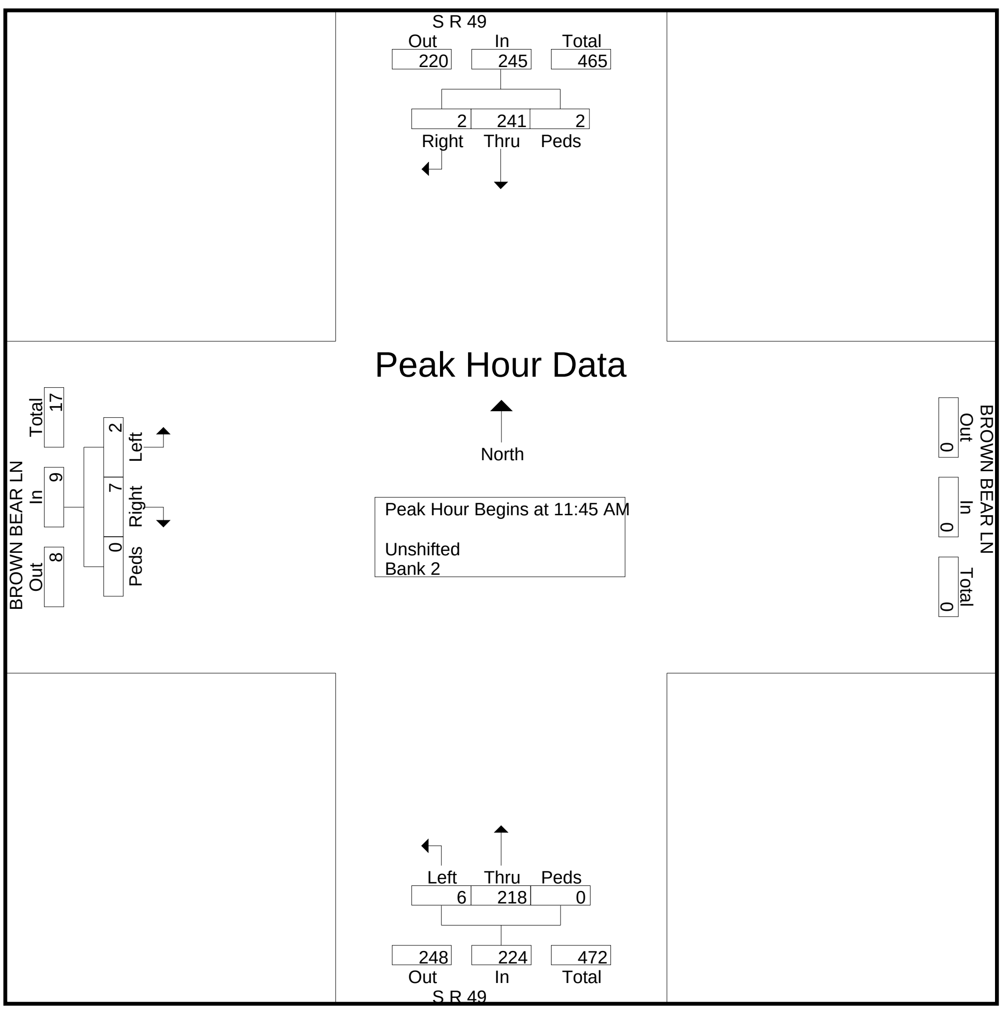


JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Brown Bear Ln at SR 49
Site Code : 00000000
Start Date : 5/8/2020
Page No : 3

	S R 49 Southbound				S R 49 Northbound				BROWN BEAR LN Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:45 AM													
11:45 AM	58	**1**	0	59	**6**	51	0	57	**2**	**3**	0	**5**	121
12:00 PM	**71**	1	0	**72**	0	53	0	53	0	2	0	2	127
12:15 PM	64	0	**1**	65	0	**64**	0	**64**	0	1	0	1	**130**
12:30 PM	48	0	1	49	0	50	0	50	0	1	0	1	100
Total Volume	241	2	2	245	6	218	0	224	2	7	0	9	478
% App. Total	98.4	0.8	0.8		2.7	97.3	0		22.2	77.8	0		
PHF	.849	.500	.500	.851	.250	.852	.000	.875	.250	.583	.000	.450	.919

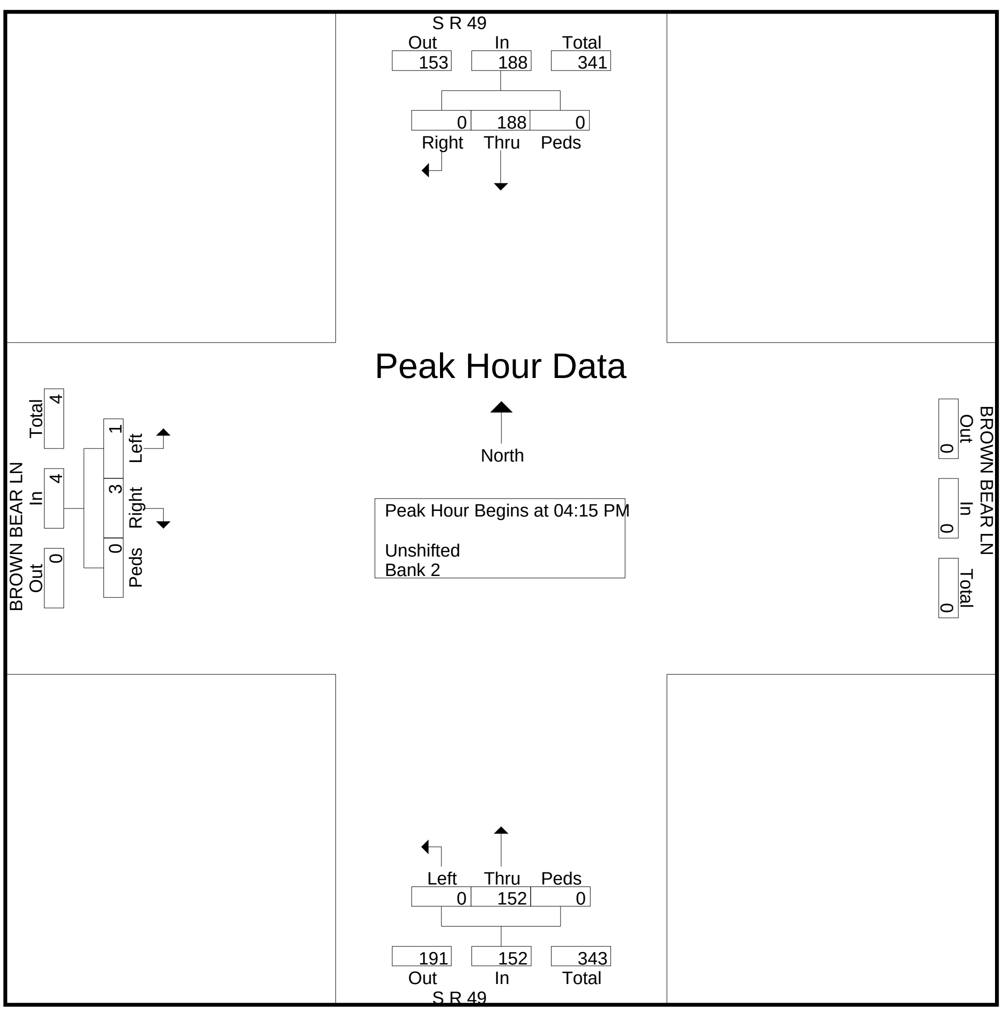


JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Brown Bear Ln at SR 49
Site Code : 00000000
Start Date : 5/8/2020

	S R 49 Southbound				S R 49 Northbound				BROWN BEAR LN Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	46	0	0	46	0	32	0	32	0	**3**	0	**3**	81
04:30 PM	46	0	0	46	0	40	0	40	**1**	0	0	1	87
04:45 PM	42	0	0	42	0	34	0	34	0	0	0	0	76
05:00 PM	**54**	0	0	**54**	0	**46**	0	**46**	0	0	0	0	**100**
Total Volume	188	0	0	188	0	152	0	152	1	3	0	4	344
% App. Total	100	0	0		0	100	0		25	75	0		
PHF	.870	.000	.000	.870	.000	.826	.000	.826	.250	.250	.000	.333	.860



JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Brown Bear Ln at SR 49
Site Code : 00000000
Start Date : 5/8/2020
Page No : 1

Groups Printed- Bank 2

	S R 49 Southbound			**S R 49 Northbound**			**BROWN BEAR LN Eastbound**			
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Int. Total
******										
07:30 AM	0	0	0	0	1	0	0	0	0	1
******										
Total	0	0	0	0	1	0	0	0	0	1
******										
08:15 AM	0	0	0	0	2	0	0	0	0	2
******										
Total	0	0	0	0	2	0	0	0	0	2
******										
05:00 PM	1	0	0	0	0	0	0	0	0	1
******										
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	0	3	0	0	0	0	4
Apprch %	100	0	0	0	100	0	0	0	0	
Total %	25	0	0	0	75	0	0	0	0	

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	SR-49 @ SR-140	**LATITUDE**	37.4931
COUNTY	Mariposa	**LONGITUDE**	-119.9727
COLLECTION DATE	Friday, September 7, 2018	**WEATHER**	Clear

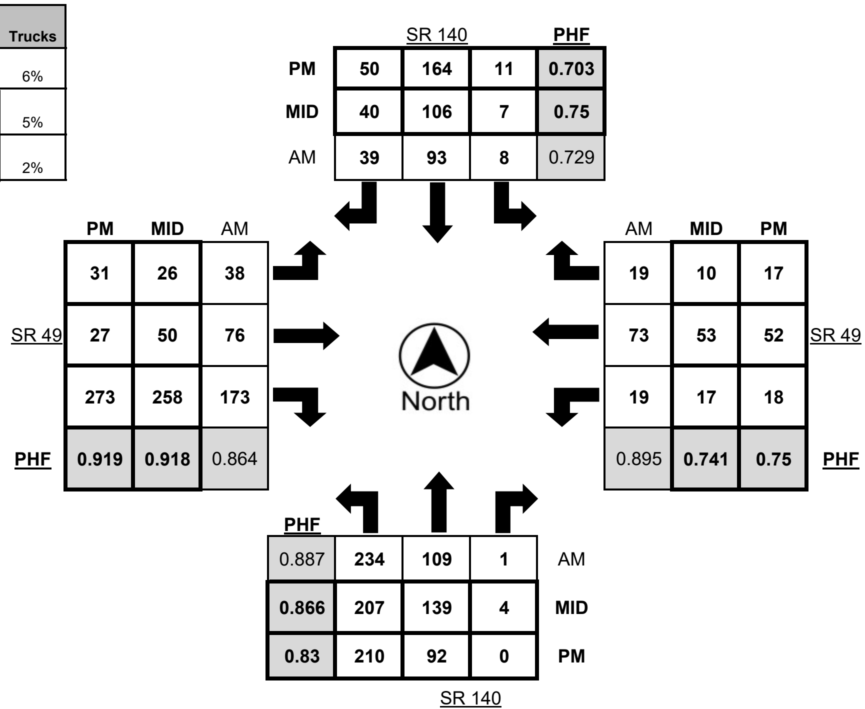
	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	29	20	1	7	1	13	2	2	3	6	14	4	3	5	0	0
7:15 AM - 7:30 AM	27	16	2	3	4	16	2	3	5	5	17	1	2	8	1	0
7:30 AM - 7:45 AM	45	28	0	9	4	13	3	2	6	18	29	3	6	7	3	0
7:45 AM - 8:00 AM	62	17	0	2	8	16	3	2	2	30	36	3	4	19	5	1
8:00 AM - 8:15 AM	68	26	0	8	5	35	8	11	7	29	33	3	5	18	7	1
8:15 AM - 8:30 AM	44	30	0	3	2	21	15	1	9	16	51	6	8	18	5	1
8:30 AM - 8:45 AM	65	32	0	4	0	22	9	3	14	10	35	1	2	14	7	0
8:45 AM - 9:00 AM	57	21	1	2	1	15	7	7	8	21	54	1	4	23	0	0
TOTAL	**397**	**190**	**4**	**38**	**25**	**151**	**49**	**31**	**54**	**135**	**269**	**22**	**34**	**112**	**28**	**3**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
11:00 AM - 11:15 AM	56	27	0	5	0	9	10	3	9	9	66	3	5	6	4	0
11:15 AM - 11:30 AM	61	22	2	3	0	31	8	2	9	10	51	2	4	13	2	0
11:30 AM - 11:45 AM	53	28	0	7	2	30	6	8	8	8	55	1	9	10	1	0
11:45 AM - 12:00 PM	44	22	0	10	2	44	20	7	14	6	47	0	5	18	4	0
12:00 PM - 12:15 PM	56	34	0	4	4	18	6	1	9	13	69	4	4	16	0	0
12:15 PM - 12:30 PM	37	43	2	8	2	34	15	10	3	9	67	1	3	6	5	0
12:30 PM - 12:45 PM	47	29	1	6	1	32	16	5	8	10	55	0	3	15	1	0
12:45 PM - 1:00 PM	67	33	1	3	0	22	3	2	6	18	67	0	7	16	4	1
TOTAL	**421**	**238**	**6**	**46**	**11**	**220**	**84**	**38**	**66**	**83**	**477**	**11**	**40**	**100**	**21**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	53	26	0	1	4	29	14	2	12	13	68	2	4	11	6	0
4:15 PM - 4:30 PM	59	29	0	0	0	14	7	4	8	8	77	6	3	7	2	0
4:30 PM - 4:45 PM	64	27	0	0	1	58	21	3	6	6	78	1	4	22	3	0
4:45 PM - 5:00 PM	57	18	0	0	4	24	5	4	6	8	59	0	5	6	5	0
5:00 PM - 5:15 PM	39	21	0	2	1	31	3	3	7	6	72	0	5	13	3	0
5:15 PM - 5:30 PM	50	26	0	0	5	51	21	0	12	7	64	2	4	11	6	0
5:30 PM - 5:45 PM	39	22	0	0	3	31	10	2	10	3	59	4	3	10	3	0
5:45 PM - 6:00 PM	30	29	1	4	1	36	3	0	8	9	44	1	3	5	2	0
TOTAL	**391**	**198**	**1**	**7**	**19**	**274**	**84**	**18**	**69**	**60**	**521**	**16**	**31**	**85**	**30**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
8:00 AM - 9:00 AM	234	109	1	17	8	93	39	22	38	76	173	11	19	73	19	2
12:00 PM - 1:00 PM	207	139	4	21	7	106	40	18	26	50	258	5	17	53	10	1
4:30 PM - 5:30 PM	210	92	0	2	11	164	50	10	31	27	273	3	18	52	17	0

	PHF	**Trucks**
AM	0.915	6%
MID	0.940	5%
PM	0.815	2%



Metro Traffic Data Inc.

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	SR-49 @ SR-140	**LATITUDE**	37.4931
COUNTY	Mariposa	**LONGITUDE**	-119.9727
COLLECTION DATE	9/7/2018	**WEATHER**	Sunny and Clear

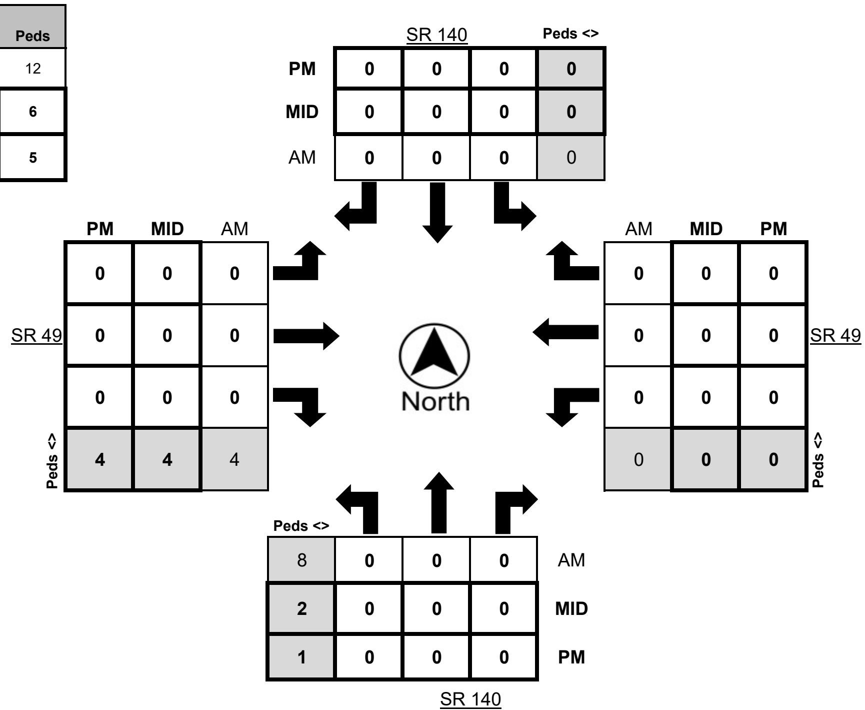
	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	2
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**13**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	5
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
8:00 AM - 9:00 AM	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	4
12:00 PM - 1:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4

	Bikes	Peds
AM	0	12
MID	**0**	**6**
PM	**0**	**5**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

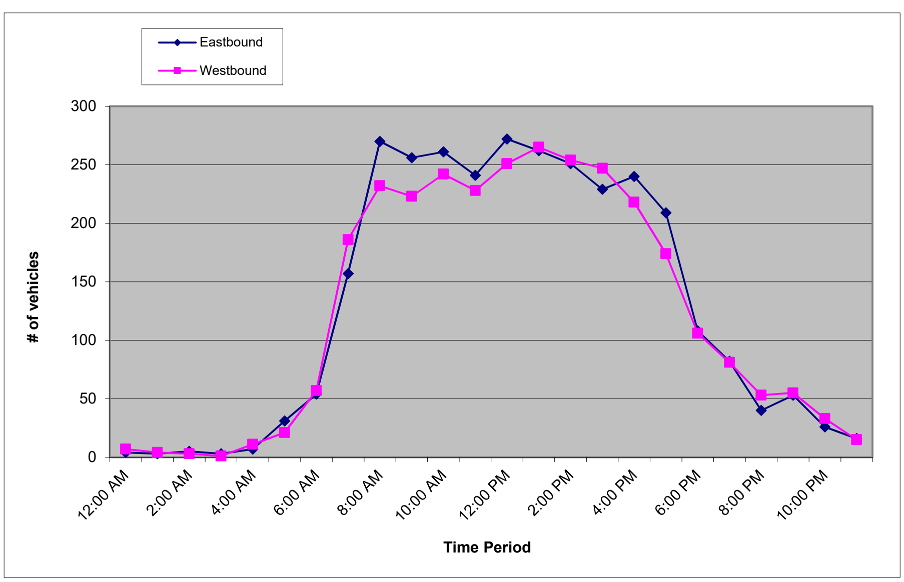
24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION SR-49, 900' w/o Joe Howard
LATITUDE 37.493664
COUNTY Mariposa
LONGITUDE -119.9772834
COLLECTION DATE Friday, September 7, 2018
WEATHER Clear
NUMBER OF LANES 3

	Eastbound					Westbound					Hourly
Hour	:00	:15	:30	:45	Total	:00	:15	:30	:45	Total	Totals
12:00 AM	0	1	2	1	4	4	0	2	1	7	11
1:00 AM	0	3	0	0	3	0	0	2	2	4	7
2:00 AM	0	1	2	2	5	0	1	2	0	3	8
3:00 AM	2	1	0	0	3	0	0	0	1	1	4
4:00 AM	2	1	1	3	7	2	1	4	4	11	18
5:00 AM	5	9	6	11	31	7	4	6	4	21	52
6:00 AM	7	8	14	25	54	11	8	17	21	57	111
7:00 AM	17	27	48	65	157	30	33	51	72	186	343
8:00 AM	78	64	52	76	270	62	58	58	54	232	502
9:00 AM	66	73	52	65	256	62	47	50	64	223	479
10:00 AM	59	64	74	64	261	71	62	45	64	242	503
11:00 AM	63	64	66	48	241	52	50	63	63	228	469
12:00 PM	84	68	57	63	272	67	54	58	72	251	523
1:00 PM	60	59	82	61	262	66	68	68	63	265	527
2:00 PM	64	55	72	60	251	63	68	66	57	254	505
3:00 PM	58	54	53	64	229	68	80	54	45	247	476
4:00 PM	54	72	74	40	240	48	53	66	51	218	458
5:00 PM	78	54	42	35	209	48	49	33	44	174	383
6:00 PM	37	27	26	18	108	26	27	25	28	106	214
7:00 PM	27	18	24	13	82	23	23	20	15	81	163
8:00 PM	9	15	6	10	40	13	22	5	13	53	93
9:00 PM	9	15	8	21	53	12	4	23	16	55	108
10:00 PM	5	10	7	4	26	8	9	9	7	33	59
11:00 PM	4	2	4	6	16	2	5	5	3	15	31
Total	50.9%				3080	49.1%				2967	
	6047										

AM%	**41.5%**	**AM Peak 504**	**9:45 am to 10:45 am**	**AM P.H.F.**	**0.97**
PM%	**58.5%**	**PM Peak 538**	**0:45 pm to 1:45 pm**	**PM P.H.F.**	**0.90**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

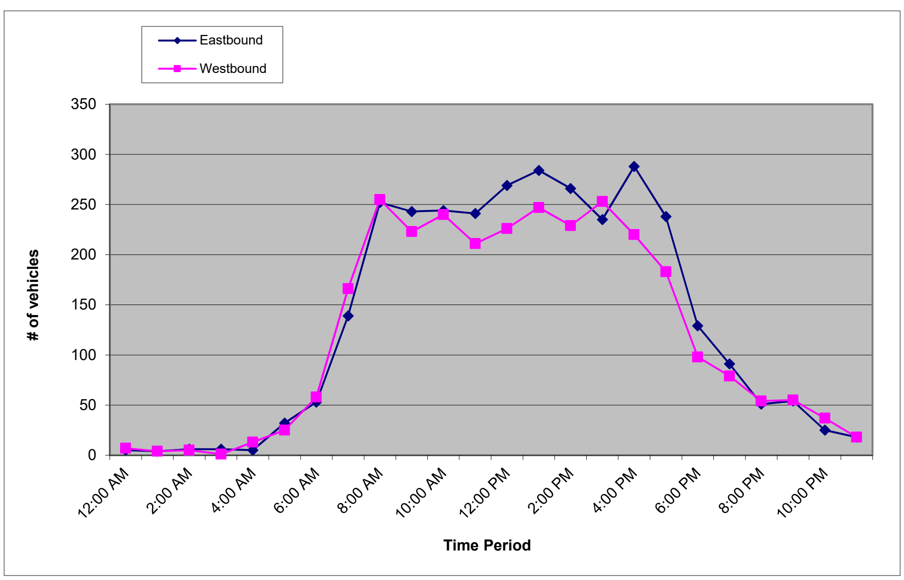
24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION SR-49, 190' w/o SR-140
COUNTY Mariposa
COLLECTION DATE Friday, September 7, 2018
NUMBER OF LANES 3
LATITUDE 37.4929842
LONGITUDE -119.9735083
WEATHER Clear

	Eastbound					Westbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	0	1	2	2	**5**	4	2	1	0	**7**	**12**
1:00 AM	0	4	0	0	**4**	0	0	2	2	**4**	**8**
2:00 AM	1	1	2	2	**6**	1	1	3	0	**5**	**11**
3:00 AM	3	3	0	0	**6**	0	0	0	1	**1**	**7**
4:00 AM	2	2	1	0	**5**	3	1	5	4	**13**	**18**
5:00 AM	5	6	6	15	**32**	7	6	7	5	**25**	**57**
6:00 AM	10	10	16	17	**53**	10	8	18	22	**58**	**111**
7:00 AM	20	21	45	53	**139**	25	26	48	67	**166**	**305**
8:00 AM	62	67	52	71	**252**	80	57	62	56	**255**	**507**
9:00 AM	71	71	50	51	**243**	57	58	51	57	**223**	**466**
10:00 AM	63	69	47	65	**244**	70	51	52	67	**240**	**484**
11:00 AM	65	62	62	52	**241**	52	51	47	61	**211**	**452**
12:00 PM	83	63	60	63	**269**	63	49	48	66	**226**	**495**
1:00 PM	73	72	65	74	**284**	64	70	49	64	**247**	**531**
2:00 PM	69	66	68	63	**266**	57	50	62	60	**229**	**495**
3:00 PM	68	60	45	62	**235**	78	75	51	49	**253**	**488**
4:00 PM	78	84	67	59	**288**	49	42	69	60	**220**	**508**
5:00 PM	77	60	53	48	**238**	36	59	49	39	**183**	**421**
6:00 PM	42	39	25	23	**129**	24	22	23	29	**98**	**227**
7:00 PM	26	24	25	16	**91**	20	23	19	17	**79**	**170**
8:00 PM	13	19	7	12	**51**	10	19	10	15	**54**	**105**
9:00 PM	10	15	9	20	**54**	11	5	23	16	**55**	**109**
10:00 PM	4	9	7	5	**25**	7	12	9	9	**37**	**62**
11:00 PM	6	2	4	6	**18**	3	6	5	4	**18**	**36**
Total	**52.2%**				**3178**	**47.8%**				**2907**	
	6085										

AM%	**40.1%**	**AM Peak 507**	**8:00 am to 9:00 am**	**AM P.H.F.**	**0.89**
PM%	**59.9%**	**PM Peak 531**	**1:00 pm to 2:00 pm**	**PM P.H.F.**	**0.93**



24 Hour Volume Report

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

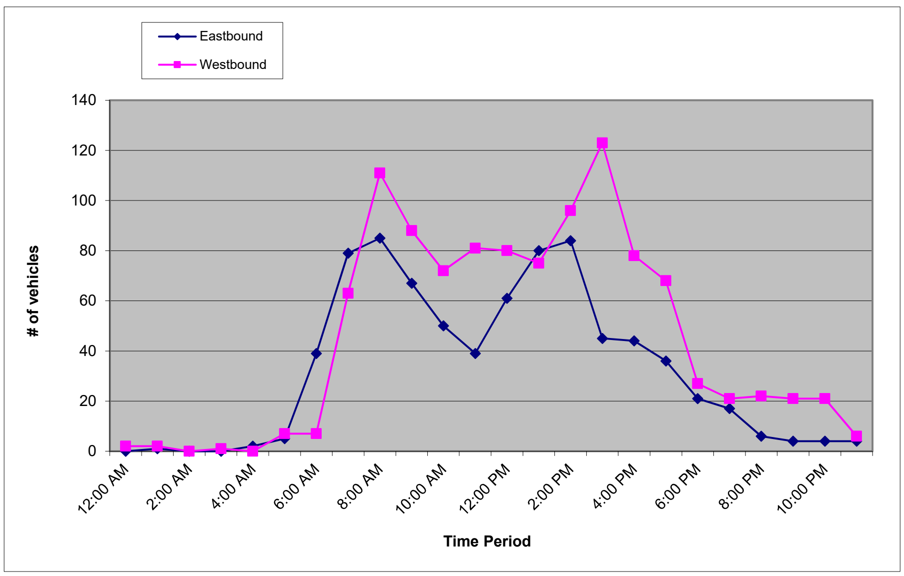
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	Jones St, 130' e/o SR-140	**LATITUDE**	37.4930608
COUNTY	Mariposa	**LONGITUDE**	-119.9722826
COLLECTION DATE	Friday, September 7, 2018	**WEATHER**	Clear
NUMBER OF LANES	2		

	Eastbound					Westbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	0	0	0	0	**0**	1	0	1	0	**2**	**2**
1:00 AM	0	0	1	0	**1**	0	2	0	0	**2**	**3**
2:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:00 AM	0	0	0	0	**0**	0	0	0	1	**1**	**1**
4:00 AM	1	0	0	1	**2**	0	0	0	0	**0**	**2**
5:00 AM	0	0	1	4	**5**	3	1	2	1	**7**	**12**
6:00 AM	2	7	21	9	**39**	0	5	0	2	**7**	**46**
7:00 AM	8	11	22	38	**79**	8	11	16	28	**63**	**142**
8:00 AM	34	18	10	23	**85**	30	31	23	27	**111**	**196**
9:00 AM	31	14	12	10	**67**	23	24	24	17	**88**	**155**
10:00 AM	16	9	12	13	**50**	14	14	29	15	**72**	**122**
11:00 AM	9	12	10	8	**39**	15	19	20	27	**81**	**120**
12:00 PM	17	13	12	19	**61**	20	14	19	27	**80**	**141**
1:00 PM	18	19	14	29	**80**	18	26	14	17	**75**	**155**
2:00 PM	16	21	28	19	**84**	23	23	17	33	**96**	**180**
3:00 PM	17	11	6	11	**45**	48	26	25	24	**123**	**168**
4:00 PM	17	8	7	12	**44**	21	12	29	16	**78**	**122**
5:00 PM	7	12	6	11	**36**	21	21	16	10	**68**	**104**
6:00 PM	4	6	5	6	**21**	9	3	6	9	**27**	**48**
7:00 PM	2	5	4	6	**17**	6	6	4	5	**21**	**38**
8:00 PM	2	1	2	1	**6**	11	4	5	2	**22**	**28**
9:00 PM	1	2	1	0	**4**	4	7	8	2	**21**	**25**
10:00 PM	0	2	1	1	**4**	3	8	5	5	**21**	**25**
11:00 PM	1	0	0	3	**4**	0	3	3	0	**6**	**10**
Total	**41.9%**				**773**	**58.1%**				**1072**	
	1845										

AM%	**43.4%**	**AM Peak 217**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.82**
PM%	**56.6%**	**PM Peak 206**	**2:15 pm to 3:15 pm**	**PM P.H.F.**	**0.79**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

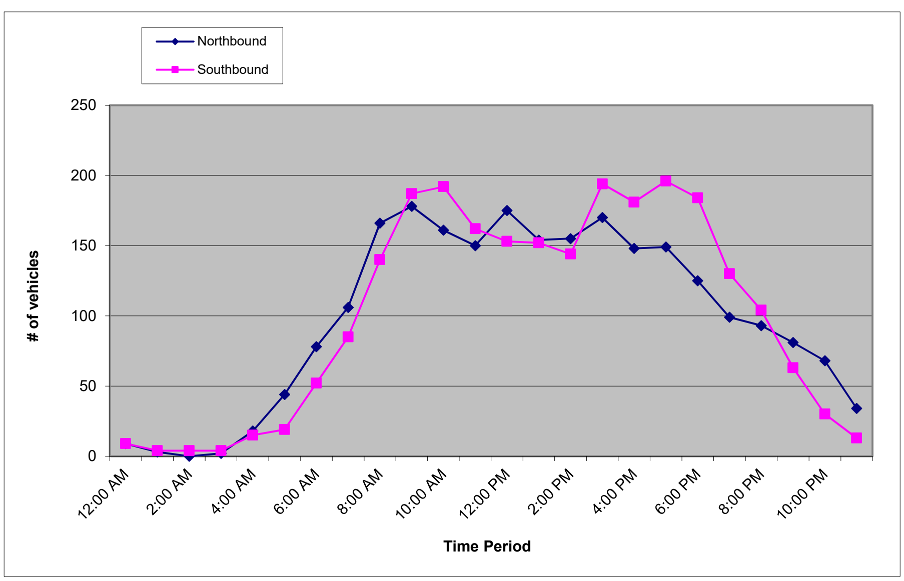
24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	SR-140, 400' n/o SR-49	**LATITUDE**	37.4941139
COUNTY	Mariposa	**LONGITUDE**	-119.9732771
COLLECTION DATE	Friday, September 7, 2018	**WEATHER**	Clear
NUMBER OF LANES	2		

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	Total	:00	:15	:30	:45	Total	Totals
12:00 AM	2	3	4	0	9	1	4	3	1	9	18
1:00 AM	1	1	1	0	3	1	1	1	1	4	7
2:00 AM	0	0	0	0	0	2	0	2	0	4	4
3:00 AM	0	0	1	1	2	1	1	0	2	4	6
4:00 AM	2	2	6	8	18	4	1	4	6	15	33
5:00 AM	9	10	14	11	44	3	3	7	6	19	63
6:00 AM	15	21	14	28	78	8	5	17	22	52	130
7:00 AM	23	22	37	24	106	16	22	20	27	85	191
8:00 AM	40	44	53	29	166	48	38	31	23	140	306
9:00 AM	43	53	47	35	178	43	35	73	36	187	365
10:00 AM	30	48	43	40	161	57	31	46	58	192	353
11:00 AM	40	33	37	40	150	19	39	38	66	162	312
12:00 PM	43	51	38	43	175	28	51	49	25	153	328
1:00 PM	46	39	35	34	154	36	44	30	42	152	306
2:00 PM	35	36	42	42	155	13	57	47	27	144	299
3:00 PM	56	40	39	35	170	63	56	48	27	194	364
4:00 PM	44	39	36	29	148	47	21	80	33	181	329
5:00 PM	31	44	35	39	149	35	77	44	40	196	345
6:00 PM	35	26	35	29	125	45	57	42	40	184	309
7:00 PM	28	28	24	19	99	33	32	33	32	130	229
8:00 PM	30	24	21	18	93	31	32	25	16	104	197
9:00 PM	17	27	16	21	81	14	21	17	11	63	144
10:00 PM	14	20	18	16	68	17	6	4	3	30	98
11:00 PM	13	9	8	4	34	2	5	2	4	13	47
Total	49.5%				2366	50.5%				2417	
	4783										

AM%	**37.4%**	**AM Peak 366**	**9:15 am to 10:15 am**	**AM P.H.F.**	**0.76**
PM%	**62.6%**	**PM Peak 373**	**2:30 pm to 3:30 pm**	**PM P.H.F.**	**0.78**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

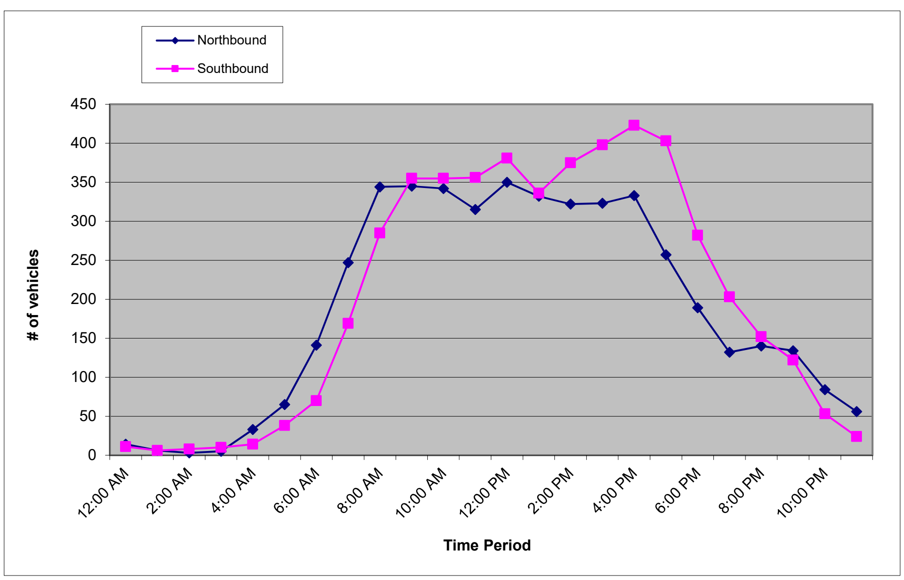
24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	SR-140, 300' s/o SR-49	**LATITUDE**	37.4922837
COUNTY	Mariposa	**LONGITUDE**	-119.9723061
COLLECTION DATE	Friday, September 7, 2018	**WEATHER**	Clear
NUMBER OF LANES	3		

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	5	3	5	1	**14**	1	3	5	2	**11**	**25**
1:00 AM	1	1	2	2	**6**	1	4	0	1	**6**	**12**
2:00 AM	0	3	0	0	**3**	1	1	3	3	**8**	**11**
3:00 AM	0	1	1	3	**5**	3	5	0	2	**10**	**15**
4:00 AM	4	5	10	14	**33**	4	2	3	5	**14**	**47**
5:00 AM	14	18	20	13	**65**	4	7	13	14	**38**	**103**
6:00 AM	26	31	30	54	**141**	16	13	13	28	**70**	**211**
7:00 AM	50	45	73	79	**247**	30	35	48	56	**169**	**416**
8:00 AM	94	74	97	79	**344**	73	80	59	73	**285**	**629**
9:00 AM	85	87	92	81	**345**	80	103	97	75	**355**	**700**
10:00 AM	80	85	77	100	**342**	84	93	81	97	**355**	**697**
11:00 AM	83	85	81	66	**315**	80	86	94	96	**356**	**671**
12:00 PM	90	82	77	101	**350**	91	104	90	96	**381**	**731**
1:00 PM	89	89	82	72	**332**	83	89	87	77	**336**	**668**
2:00 PM	77	71	88	86	**322**	81	101	106	87	**375**	**697**
3:00 PM	105	80	67	71	**323**	113	98	89	98	**398**	**721**
4:00 PM	79	88	91	75	**333**	101	94	140	88	**423**	**756**
5:00 PM	60	76	61	60	**257**	108	119	93	83	**403**	**660**
6:00 PM	56	38	47	48	**189**	77	78	71	56	**282**	**471**
7:00 PM	31	41	27	33	**132**	57	44	58	44	**203**	**335**
8:00 PM	33	44	31	32	**140**	42	52	32	26	**152**	**292**
9:00 PM	23	38	37	36	**134**	26	35	29	32	**122**	**256**
10:00 PM	22	25	22	15	**84**	26	14	7	6	**53**	**137**
11:00 PM	19	15	13	9	**56**	7	3	6	8	**24**	**80**
Total	**48.3%**				**4512**	**51.7%**				**4829**	
	9341										

AM%	**37.9%**	**AM Peak 700**	**9:00 am to 10:00 am**	**AM P.H.F.**	**0.92**
PM%	**62.1%**	**PM Peak 762**	**3:45 pm to 4:45 pm**	**PM P.H.F.**	**0.82**



Appendix C: LOS Methodology

Levels of Service Methodology

The description and procedures for calculating capacity and level of service (LOS) are found in the Transportation Research Board, Highway Capacity Manual (HCM). The HCM 2010 represents the research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level of service (LOS), from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish a LOS.

Urban Streets (Automobile Mode)

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas. Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials. Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals. Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing taxicabs, buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

Flow Characteristics

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control.

The street environment includes the geometric characteristics of the facility, the character of roadside activity, and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway/access point density, spacing between signalized intersections, existence of parking, level of pedestrian and bicyclist activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic controls (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds; however, such controls are needed to establish right-of-way.

Levels of Service (automobile Mode)

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal. Travel speeds exceed 85 of the base free flow speed (FFS).

LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 and 85 percent of the base FFS.

LOS C describes stable operations. The ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 and 67 percent of the base FFS.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volumes, inappropriate signal timing, at the boundary intersections. The travel speed is between 40 and 50 percent of the base FFS.

LOS E is characterized unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 and 40 percent of the base FFS.

LOS F is characterized by street flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base FFS.

Table A-1: Urban Street Levels of Service (Automobile Mode)

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio[a]	
	≤1.0	**>1.0**
>85	A	F
>67 to 85	B	F
>50 to 67	C	F
>40 to 50	D	F
>30 to 40	E	F
≤30	F	F

a = The Critical volume-to-capacity ratio is based on consideration of the through movement-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.
Source: Highway Capacity Manual 2010, Exhibit 16-4. Urban Street LOS Criteria (Automobile Mode)

Intersection Levels of Service

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs.

Signalized Intersections – Performance Measures

For signalized intersections the performance measures include automobile volume-to-capacity ratio, automobile delay, queue storage length, ratio of pedestrian delay, pedestrian circulation area, pedestrian perception score, bicycle delay, and bicycle perception score. LOS is also considered a performance measure. For the automobile mode average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the weighted average control delay to better describe the level of operation. A description of LOS for signalized intersections is found in Table A-2.

Table A-2: Signalized Intersection Level of Service Description (Automobile Mode)

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with a control delay of 10 seconds/vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is and either progression is exceptionally favorable or the cycle length is very short. If it's due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Operations with control delay between 10.1 to 20.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10.0 to 20.0
C	Operations with average control delays between 20.1 to 35.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Operations with control delay between 35.1 to 55.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop, and i ndividual cycle failures are noticeable.	>35 to 55
E	Operations with control delay between 55.1 to 80.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Operations with unacceptable control delay exceeding 80.0 seconds/vehicle and a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: Highway Capacity Manual 2010

Unsignalized Intersections

The HCM 2010 procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, i. e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

All-Way Stop Controlled Intersections

All-way stop controlled intersections is a form of traffic controls in which all approaches to an intersection are required to stop. Similar to signalized intersections, at all-way stop controlled intersections the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection as a whole. In other words the delay measured for all-way stop controlled intersections is a measure of the average delay for all vehicles passing through the intersection during the peak hour. A LOS designation is given to the weighted average control delay to better describe the level of operation.

Two-Way Stop Controlled Intersections

Two-way stop controlled (TWSC) intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At TWSC intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS for TWSC intersection is determined by the computed or measured control delay for each minor movement. LOS is not defined for the intersection as a whole for three main reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at the typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay from all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. Table A-3 provides a description of LOS at unsignalized intersections.

Table A-3: Unsignalized Intersection Level of Service Description (Automobile Mode)

Control Delay (seconds per vehicle)	**LOS by Volume-to-Capacity Ratio**	
	v/c ≤ 1.0	**v/c > 1.0**
≤10	A	F
>10 to 15	B	F
>15 to 25	C	F
>25 to 35	D	F
>35 to 50	E	F
>50	F	F

Source: HCM 2010 Exhibit 19-1.

Appendix D: Existing (Base Year 2020) Traffic Conditions

Intersection	
Int Delay, s/veh	0.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	220	4	11	283	4	4
Future Vol, veh/h	220	4	11	283	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	81	81	50	50
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	259	5	14	349	8	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	264	0	639	262
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	377	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1294	-	440	777
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	435	777
Mov Cap-2 Maneuver	-	-	-	-	527	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	694	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.3	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	628	1294	-	-	-
HCM Lane V/C Ratio	0.025	0.01	-	-	-
HCM Control Delay (s)	10.9	7.8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0	-	-	-

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	77	176	19	74	19	238	111	1	8	95	40
Future Vol, veh/h	39	77	176	19	74	19	238	111	1	8	95	40
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.89	0.89	0.89	0.73	0.73	0.73
Heavy Vehicles, %	4	4	4	2	2	2	5	5	5	16	16	16
Mvmt Flow	45	90	205	21	82	21	267	125	1	11	130	55
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	11.2	12.3	15.8	12
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	17%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	66%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	17%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	238	111	1	39	77	176	112	8	95	40
LT Vol	238	0	0	39	0	0	19	8	0	0
Through Vol	0	111	0	0	77	0	74	0	95	0
RT Vol	0	0	1	0	0	176	19	0	0	40
Lane Flow Rate	267	125	1	45	90	205	124	11	130	55
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.533	0.231	0.002	0.089	0.164	0.334	0.248	0.024	0.266	0.101
Departure Headway (Hd)	7.18	6.673	5.963	7.085	6.583	5.88	7.166	7.878	7.369	6.656
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	535	596	503	542	608	498	452	484	534
Service Time	4.959	4.452	3.742	4.862	4.36	3.656	4.96	5.675	5.165	4.452
HCM Lane V/C Ratio	0.534	0.234	0.002	0.089	0.166	0.337	0.249	0.024	0.269	0.103
HCM Control Delay	17.9	11.5	8.8	10.6	10.7	11.6	12.3	10.9	12.8	10.2
HCM Lane LOS	C	B	A	B	B	B	B	B	B	B
HCM 95th-tile Q	3.1	0.9	0	0.3	0.6	1.5	1	0.1	1.1	0.3

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	272	2	7	246	2	8
Future Vol, veh/h	272	2	7	246	2	8
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	88	88	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	320	2	8	280	4	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	324	0	619	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1236	-	452	718
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	755	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1234	-	448	717
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	755	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	673	1234	-	-	-
HCM Lane V/C Ratio	0.033	0.006	-	-	-
HCM Control Delay (s)	10.5	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0	-	-	-

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	51	262	17	54	10	210	141	4	7	108	41
Future Vol, veh/h	26	51	262	17	54	10	210	141	4	7	108	41
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.87	0.87	0.87	0.75	0.75	0.75
Heavy Vehicles, %	1	1	1	1	1	1	6	6	6	12	12	12
Mvmt Flow	28	55	285	23	73	14	241	162	5	9	144	55
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	12.9	12.3	15.2	12.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	21%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	67%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	210	141	4	26	51	262	81	7	108	41
LT Vol	210	0	0	26	0	0	17	7	0	0
Through Vol	0	141	0	0	51	0	54	0	108	0
RT Vol	0	0	4	0	0	262	10	0	0	41
Lane Flow Rate	241	162	5	28	55	285	109	9	144	55
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.494	0.309	0.008	0.055	0.101	0.463	0.226	0.021	0.299	0.103
Departure Headway (Hd)	7.374	6.866	6.155	7.168	6.665	5.961	7.424	7.978	7.469	6.755
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	492	527	585	503	541	609	485	450	482	532
Service Time	5.074	4.566	3.855	4.868	4.365	3.661	5.148	5.697	5.188	4.474
HCM Lane V/C Ratio	0.49	0.307	0.009	0.056	0.102	0.468	0.225	0.02	0.299	0.103
HCM Control Delay	17.1	12.6	8.9	10.3	10.1	13.7	12.3	10.9	13.4	10.3
HCM Lane LOS	C	B	A	B	B	B	B	B	B	B
HCM 95th-tile Q	2.7	1.3	0	0.2	0.3	2.4	0.9	0.1	1.2	0.3

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	269	0	0	217	1	4
Future Vol, veh/h	269	0	0	217	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	83	83	33	33
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	309	0	0	261	3	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	570	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	483	731
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	483	731
Mov Cap-2 Maneuver	-	-	-	-	569	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	783	-

Approach	SE		NW		NE	
HCM Control Delay, s	0		0		10.3	
HCM LOS					B	

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	692	1257	-	-	-
HCM Lane V/C Ratio	0.022	-	-	-	-
HCM Control Delay (s)	10.3	0	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0	-	-	-

Intersection	
Intersection Delay, s/veh	15.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	27	278	18	53	17	214	94	0	11	167	51
Future Vol, veh/h	32	27	278	18	53	17	214	94	0	11	167	51
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.83	0.83	0.83	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	4	4	4
Mvmt Flow	35	29	302	24	71	23	258	113	0	16	239	73
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	15.2	13.5	17.5	15.6
HCM LOS	C	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	20%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	60%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	19%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	94	0	32	27	278	88	11	167	51
LT Vol	214	0	0	32	0	0	18	11	0	0
Through Vol	0	94	0	0	27	0	53	0	167	0
RT Vol	0	0	0	0	0	278	17	0	0	51
Lane Flow Rate	258	113	0	35	29	302	117	16	239	73
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.555	0.228	0	0.073	0.058	0.533	0.26	0.035	0.495	0.137
Departure Headway (Hd)	7.753	7.243	7.243	7.569	7.06	6.349	7.97	7.976	7.466	6.751
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	464	495	0	473	507	568	451	449	482	530
Service Time	5.506	4.996	4.996	5.314	4.805	4.094	5.731	5.728	5.218	4.502
HCM Lane V/C Ratio	0.556	0.228	0	0.074	0.057	0.532	0.259	0.036	0.496	0.138
HCM Control Delay	19.8	12.1	10	10.9	10.2	16.2	13.5	11	17.4	10.6
HCM Lane LOS	C	B	N	B	B	C	B	B	C	B
HCM 95th-tile Q	3.3	0.9	0	0.2	0.2	3.1	1	0.1	2.7	0.5

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	526
Total Delay (hr)	0
Stops (#)	8
Average Speed (mph)	35
Total Travel Time (hr)	2
Distance Traveled (mi)	55
Fuel Consumed (gal)	2
Fuel Economy (mpg)	25.8
CO Emissions (kg)	0.15
NOx Emissions (kg)	0.03
VOC Emissions (kg)	0.03

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	897
Total Delay (hr)	0
Stops (#)	897
Average Speed (mph)	32
Total Travel Time (hr)	6
Distance Traveled (mi)	204
Fuel Consumed (gal)	14
Fuel Economy (mpg)	14.9
CO Emissions (kg)	0.96
NOx Emissions (kg)	0.19
VOC Emissions (kg)	0.22

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	537
Total Delay (hr)	0
Stops (#)	10
Average Speed (mph)	37
Total Travel Time (hr)	2
Distance Traveled (mi)	61
Fuel Consumed (gal)	2
Fuel Economy (mpg)	26.1
CO Emissions (kg)	0.16
NOx Emissions (kg)	0.03
VOC Emissions (kg)	0.04

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	931
Total Delay (hr)	0
Stops (#)	931
Average Speed (mph)	33
Total Travel Time (hr)	7
Distance Traveled (mi)	220
Fuel Consumed (gal)	15
Fuel Economy (mpg)	15.0
CO Emissions (kg)	1.03
NOx Emissions (kg)	0.20
VOC Emissions (kg)	0.24

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	491
Total Delay (hr)	0
Stops (#)	5
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	57
Fuel Consumed (gal)	2
Fuel Economy (mpg)	26.4
CO Emissions (kg)	0.15
NOx Emissions (kg)	0.03
VOC Emissions (kg)	0.03

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	962
Total Delay (hr)	0
Stops (#)	962
Average Speed (mph)	33
Total Travel Time (hr)	7
Distance Traveled (mi)	224
Fuel Consumed (gal)	15
Fuel Economy (mpg)	14.9
CO Emissions (kg)	1.06
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.24

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	29	30
Average Queue (ft)	1	7
95th Queue (ft)	10	27
Link Distance (ft)		414
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	66	75	76	97	92	78	24	87
Average Queue (ft)	23	32	39	38	52	42	3	39
95th Queue (ft)	50	56	64	65	81	64	16	67
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0	0	1			0		
Queuing Penalty (veh)	0	0	1			1		

Zone Summary

Zone wide Queuing Penalty: 2

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NE
Directions Served	LR
Maximum Queue (ft)	28
Average Queue (ft)	9
95th Queue (ft)	30
Link Distance (ft)	420
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	29	76	93	67	99	78	24	71
Average Queue (ft)	15	25	41	33	49	43	4	38
95th Queue (ft)	37	47	68	55	82	70	18	64
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)		0	1			0		
Queuing Penalty (veh)		0	1			1		

Zone Summary

Zone wide Queuing Penalty: 2

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NE
Directions Served	LR
Maximum Queue (ft)	28
Average Queue (ft)	5
95th Queue (ft)	22
Link Distance (ft)	416
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	30	49	88	54	103	55	24	79
Average Queue (ft)	17	17	50	34	52	34	5	42
95th Queue (ft)	40	40	76	52	84	51	20	71
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)			1			0		
Queuing Penalty (veh)			0			0		

Zone Summary

Zone wide Queuing Penalty: 1

Appendix E: Opening Year 2022 plus Project Traffic Conditions

Intersection						
Int Delay, s/veh	1					

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	232	20	21	301	13	11
Future Vol, veh/h	232	20	21	301	13	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	81	81	50	50
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	273	24	26	372	26	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	297	0	709	285
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	424	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1259	-	401	754
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1259	-	393	754
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	660	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	584	1259	-	-	-
HCM Lane V/C Ratio	0.082	0.021	-	-	-
HCM Control Delay (s)	11.7	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	236	8	41	310	11	54
Future Vol, veh/h	236	8	41	310	11	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	81	81	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	278	9	51	383	12	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	287	0	768	283
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1269	-	370	756
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1269	-	355	756
Mov Cap-2 Maneuver	-	-	-	-	449	-
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	619	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.9	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	678	1269	-	-	-
HCM Lane V/C Ratio	0.104	0.04	-	-	-
HCM Control Delay (s)	10.9	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	15.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	90	208	19	77	21	276	113	1	8	97	57
Future Vol, veh/h	54	90	208	19	77	21	276	113	1	8	97	57
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.89	0.89	0.89	0.73	0.73	0.73
Heavy Vehicles, %	4	4	4	2	2	2	5	5	5	16	16	16
Mvmt Flow	63	105	242	21	86	23	310	127	1	11	133	78
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	12.7	13.5	20.6	12.9
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	16%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	66%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	18%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	276	113	1	54	90	208	117	8	97	57
LT Vol	276	0	0	54	0	0	19	8	0	0
Through Vol	0	113	0	0	90	0	77	0	97	0
RT Vol	0	0	1	0	0	208	21	0	0	57
Lane Flow Rate	310	127	1	63	105	242	130	11	133	78
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.66	0.252	0.002	0.131	0.203	0.422	0.28	0.026	0.294	0.157
Departure Headway (Hd)	7.667	7.158	6.445	7.495	6.991	6.286	7.745	8.472	7.96	7.244
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	471	502	555	479	514	573	464	423	452	495
Service Time	5.409	4.899	4.186	5.233	4.729	4.023	5.491	6.22	5.708	4.991
HCM Lane V/C Ratio	0.658	0.253	0.002	0.132	0.204	0.422	0.28	0.026	0.294	0.158
HCM Control Delay	24.1	12.3	9.2	11.4	11.5	13.6	13.5	11.4	14	11.3
HCM Lane LOS	C	B	A	B	B	B	B	B	B	B
HCM 95th-tile Q	4.7	1	0	0.4	0.8	2.1	1.1	0.1	1.2	0.6

Intersection	
Int Delay, s/veh	1.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	284	13	13	261	15	18
Future Vol, veh/h	284	13	13	261	15	18
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	88	88	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	334	15	15	297	33	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	351	0	671	344
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	327	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1208	-	422	699
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1206	-	416	698
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	731	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	601	1206	-	-	-
HCM Lane V/C Ratio	0.122	0.012	-	-	-
HCM Control Delay (s)	11.8	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	294	7	40	263	11	50
Future Vol, veh/h	294	7	40	263	11	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	346	8	45	299	12	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	354	0	739	350
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	389	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1205	-	385	693
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	685	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1205	-	371	693
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	685	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.1	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	639	1205	-	-	-
HCM Lane V/C Ratio	0.104	0.038	-	-	-
HCM Control Delay (s)	11.3	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	15.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	52	306	17	55	10	243	143	4	7	110	56
Future Vol, veh/h	43	52	306	17	55	10	243	143	4	7	110	56
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.87	0.87	0.87	0.75	0.75	0.75
Heavy Vehicles, %	1	1	1	1	1	1	6	6	6	12	12	12
Mvmt Flow	47	57	333	23	74	14	279	164	5	9	147	75
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	15.5	13.1	18.4	13.2
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	21%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	67%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	243	143	4	43	52	306	82	7	110	56
LT Vol	243	0	0	43	0	0	17	7	0	0
Through Vol	0	143	0	0	52	0	55	0	110	0
RT Vol	0	0	4	0	0	306	10	0	0	56
Lane Flow Rate	279	164	5	47	57	333	111	9	147	75
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.6	0.33	0.008	0.096	0.108	0.573	0.242	0.022	0.322	0.149
Departure Headway (Hd)	7.727	7.217	6.504	7.411	6.907	6.202	7.873	8.42	7.908	7.192
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	466	498	550	484	519	582	457	425	455	498
Service Time	5.468	4.958	4.245	5.148	4.644	3.939	5.623	6.17	5.658	4.941
HCM Lane V/C Ratio	0.599	0.329	0.009	0.097	0.11	0.572	0.243	0.021	0.323	0.151
HCM Control Delay	21.4	13.5	9.3	10.9	10.5	17	13.1	11.4	14.4	11.2
HCM Lane LOS	C	B	A	B	B	C	B	B	B	B
HCM 95th-tile Q	3.9	1.4	0	0.3	0.4	3.6	0.9	0.1	1.4	0.5

Intersection	
Int Delay, s/veh	1.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	286	15	7	232	12	16
Future Vol, veh/h	286	15	7	232	12	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	83	83	33	33
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	329	17	8	280	36	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	346	0	634	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1219	-	443	704
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	755	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1219	-	440	704
Mov Cap-2 Maneuver	-	-	-	-	535	-
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	755	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	620	1219	-	-	-
HCM Lane V/C Ratio	0.137	0.007	-	-	-
HCM Control Delay (s)	11.7	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	0	-	-	-

Intersection						
Int Delay, s/veh	1.8					

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	289	13	63	229	11	53
Future Vol, veh/h	289	13	63	229	11	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	83	83	92	92
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	332	15	76	276	12	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	347	0	768	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1218	-	370	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	347	702
Mov Cap-2 Maneuver	-	-	-	-	442	-
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	657	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.8	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	638	1218	-	-	-
HCM Lane V/C Ratio	0.109	0.062	-	-	-
HCM Control Delay (s)	11.3	8.2	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	29	326	18	54	18	262	96	0	11	170	73
Future Vol, veh/h	49	29	326	18	54	18	262	96	0	11	170	73
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.83	0.83	0.83	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	4	4	4
Mvmt Flow	53	32	354	24	72	24	316	116	0	16	243	104
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	20.1	15.1	25.6	17.6
HCM LOS	C	C	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	20%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	60%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	20%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	262	96	0	49	29	326	90	11	170	73
LT Vol	262	0	0	49	0	0	18	11	0	0
Through Vol	0	96	0	0	29	0	54	0	170	0
RT Vol	0	0	0	0	0	326	18	0	0	73
Lane Flow Rate	316	116	0	53	32	354	120	16	243	104
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.726	0.249	0	0.118	0.066	0.667	0.29	0.038	0.546	0.213
Departure Headway (Hd)	8.276	7.764	7.764	8.005	7.494	6.779	8.7	8.603	8.09	7.37
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	436	460	0	447	477	532	410	415	444	485
Service Time	6.056	5.543	5.543	5.773	5.262	4.547	6.5	6.388	5.874	5.154
HCM Lane V/C Ratio	0.725	0.252	0	0.119	0.067	0.665	0.293	0.039	0.547	0.214
HCM Control Delay	30.2	13.1	10.5	11.9	10.8	22.2	15.1	11.7	20.3	12.2
HCM Lane LOS	D	B	N	B	B	C	C	B	C	B
HCM 95th-tile Q	5.7	1	0	0.4	0.2	4.9	1.2	0.1	3.2	0.8

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	598
Total Delay (hr)	0
Stops (#)	24
Average Speed (mph)	35
Total Travel Time (hr)	2
Distance Traveled (mi)	63
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.1
CO Emissions (kg)	0.17
NOx Emissions (kg)	0.03
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	660
Total Delay (hr)	0
Stops (#)	65
Average Speed (mph)	34
Total Travel Time (hr)	4
Distance Traveled (mi)	139
Fuel Consumed (gal)	6
Fuel Economy (mpg)	24.9
CO Emissions (kg)	0.39
NOx Emissions (kg)	0.08
VOC Emissions (kg)	0.09

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1021
Total Delay (hr)	0
Stops (#)	1021
Average Speed (mph)	33
Total Travel Time (hr)	7
Distance Traveled (mi)	236
Fuel Consumed (gal)	16
Fuel Economy (mpg)	15.0
CO Emissions (kg)	1.10
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.26

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	604
Total Delay (hr)	0
Stops (#)	33
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	68
Fuel Consumed (gal)	3
Fuel Economy (mpg)	24.9
CO Emissions (kg)	0.19
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	665
Total Delay (hr)	0
Stops (#)	61
Average Speed (mph)	37
Total Travel Time (hr)	3
Distance Traveled (mi)	125
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.6
CO Emissions (kg)	0.34
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.08

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1046
Total Delay (hr)	0
Stops (#)	1046
Average Speed (mph)	33
Total Travel Time (hr)	8
Distance Traveled (mi)	251
Fuel Consumed (gal)	17
Fuel Economy (mpg)	15.1
CO Emissions (kg)	1.17
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.27

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	568
Total Delay (hr)	0
Stops (#)	28
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	65
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.4
CO Emissions (kg)	0.18
NOx Emissions (kg)	0.03
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	658
Total Delay (hr)	0
Stops (#)	64
Average Speed (mph)	37
Total Travel Time (hr)	3
Distance Traveled (mi)	121
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.0
CO Emissions (kg)	0.34
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.08

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1106
Total Delay (hr)	0
Stops (#)	1106
Average Speed (mph)	33
Total Travel Time (hr)	8
Distance Traveled (mi)	261
Fuel Consumed (gal)	18
Fuel Economy (mpg)	14.9
CO Emissions (kg)	1.22
NOx Emissions (kg)	0.24
VOC Emissions (kg)	0.28

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	30
Average Queue (ft)	4	15
95th Queue (ft)	21	39
Link Distance (ft)		414
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	56
Average Queue (ft)	8	31
95th Queue (ft)	30	51
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	75	70	94	77	152	55	43	72
Average Queue (ft)	29	32	49	39	62	42	5	40
95th Queue (ft)	55	58	74	67	111	60	23	67
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0	0	1			0		
Queuing Penalty (veh)	0	0	1			1		

Network Summary

Network wide Queuing Penalty: 2

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	30	50
Average Queue (ft)	5	21
95th Queue (ft)	22	42
Link Distance (ft)		420
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	28	53
Average Queue (ft)	4	27
95th Queue (ft)	21	45
Link Distance (ft)		421
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	50	51	116	55	117	114	40	97
Average Queue (ft)	21	22	59	35	64	45	2	39
95th Queue (ft)	44	44	94	50	98	80	16	69
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)		0	3			1		
Queuing Penalty (veh)		0	3			2		

Network Summary

Network wide Queuing Penalty: 5

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NE
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	15
95th Queue (ft)	37
Link Distance (ft)	416
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	77	54
Average Queue (ft)	16	28
95th Queue (ft)	45	52
Link Distance (ft)		451
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	51	28	171	56	121	71	24	89
Average Queue (ft)	22	19	58	32	56	35	6	45
95th Queue (ft)	48	39	105	51	93	59	23	70
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0		3			0		
Queuing Penalty (veh)	0		2			1		

Network Summary

Network wide Queuing Penalty: 3

Appendix F: Cumulative Year 2025 plus Project Traffic Conditions

Intersection	
Int Delay, s/veh	1

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	241	20	21	308	13	11
Future Vol, veh/h	241	20	21	308	13	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	81	81	50	50
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	284	24	26	380	26	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	728	296
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1247	-	390	743
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1247	-	382	743
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	655	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	574	1247	-	-	-
HCM Lane V/C Ratio	0.084	0.021	-	-	-
HCM Control Delay (s)	11.8	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	-

Intersection						
Int Delay, s/veh	1.5					

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	245	8	41	317	11	54
Future Vol, veh/h	245	8	41	317	11	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	81	81	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	288	9	51	391	12	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	297	0	786	293
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	493	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1259	-	361	746
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	614	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1259	-	346	746
Mov Cap-2 Maneuver	-	-	-	-	442	-
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	614	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.9	11
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	668	1259	-	-	-
HCM Lane V/C Ratio	0.106	0.04	-	-	-
HCM Control Delay (s)	11	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	17.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	92	223	20	79	22	289	116	1	8	99	64
Future Vol, veh/h	61	92	223	20	79	22	289	116	1	8	99	64
Peak Hour Factor	0.86	0.86	0.86	0.90	0.90	0.90	0.89	0.89	0.89	0.73	0.73	0.73
Heavy Vehicles, %	4	4	4	2	2	2	5	5	5	16	16	16
Mvmt Flow	71	107	259	22	88	24	325	130	1	11	136	88
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	13.5	14.1	23.3	13.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	17%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	65%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	18%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	289	116	1	61	92	223	121	8	99	64
LT Vol	289	0	0	61	0	0	20	8	0	0
Through Vol	0	116	0	0	92	0	79	0	99	0
RT Vol	0	0	1	0	0	223	22	0	0	64
Lane Flow Rate	325	130	1	71	107	259	134	11	136	88
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.709	0.266	0.002	0.151	0.212	0.464	0.297	0.026	0.308	0.182
Departure Headway (Hd)	7.856	7.346	6.632	7.648	7.144	6.437	7.963	8.695	8.182	7.464
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	461	489	539	469	503	560	450	411	439	480
Service Time	5.605	5.094	4.38	5.392	4.887	4.181	5.718	6.454	5.941	5.222
HCM Lane V/C Ratio	0.705	0.266	0.002	0.151	0.213	0.463	0.298	0.027	0.31	0.183
HCM Control Delay	27.6	12.8	9.4	11.8	11.8	14.7	14.1	11.7	14.6	11.9
HCM Lane LOS	D	B	A	B	B	B	B	B	B	B
HCM 95th-tile Q	5.5	1.1	0	0.5	0.8	2.4	1.2	0.1	1.3	0.7

Intersection	
Int Delay, s/veh	1.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	290	13	13	267	15	18
Future Vol, veh/h	290	13	13	267	15	18
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	88	88	45	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	341	15	15	303	33	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	358	0	684	351
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1201	-	414	692
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1199	-	408	691
Mov Cap-2 Maneuver	-	-	-	-	509	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	726	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	594	1199	-	-	-
HCM Lane V/C Ratio	0.123	0.012	-	-	-
HCM Control Delay (s)	11.9	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	301	7	40	270	11	50
Future Vol, veh/h	301	7	40	270	11	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	354	8	45	307	12	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	362	0	755	358
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1197	-	376	686
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1197	-	362	686
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	679	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	632	1197	-	-	-
HCM Lane V/C Ratio	0.105	0.038	-	-	-
HCM Control Delay (s)	11.4	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	16.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	53	318	18	56	10	251	147	4	7	113	60
Future Vol, veh/h	50	53	318	18	56	10	251	147	4	7	113	60
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.87	0.87	0.87	0.75	0.75	0.75
Heavy Vehicles, %	1	1	1	1	1	1	6	6	6	12	12	12
Mvmt Flow	54	58	346	24	76	14	289	169	5	9	151	80
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	16.5	13.5	19.7	13.6
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	21%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	67%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	251	147	4	50	53	318	84	7	113	60
LT Vol	251	0	0	50	0	0	18	7	0	0
Through Vol	0	147	0	0	53	0	56	0	113	0
RT Vol	0	0	4	0	0	318	10	0	0	60
Lane Flow Rate	289	169	5	54	58	346	114	9	151	80
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.631	0.345	0.008	0.114	0.112	0.606	0.254	0.022	0.338	0.163
Departure Headway (Hd)	7.872	7.361	6.647	7.519	7.015	6.309	8.043	8.586	8.073	7.355
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	459	488	538	477	511	574	446	417	444	487
Service Time	5.62	5.11	4.395	5.259	4.755	4.049	5.799	6.343	5.83	5.112
HCM Lane V/C Ratio	0.63	0.346	0.009	0.113	0.114	0.603	0.256	0.022	0.34	0.164
HCM Control Delay	23.2	14	9.4	11.2	10.6	18.3	13.5	11.5	14.9	11.5
HCM Lane LOS	C	B	A	B	B	C	B	B	B	B
HCM 95th-tile Q	4.3	1.5	0	0.4	0.4	4	1	0.1	1.5	0.6

Intersection	
Int Delay, s/veh	1.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	296	15	7	239	12	16
Future Vol, veh/h	296	15	7	239	12	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	83	83	33	33
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	340	17	8	288	36	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	357	0	653	349
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1207	-	432	694
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	429	694
Mov Cap-2 Maneuver	-	-	-	-	526	-
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	748	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	610	1207	-	-	-
HCM Lane V/C Ratio	0.139	0.007	-	-	-
HCM Control Delay (s)	11.9	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.5	0	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	298	13	63	236	11	53
Future Vol, veh/h	298	13	63	236	11	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	83	83	92	92
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	343	15	76	284	12	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	358	0	787	351
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1206	-	360	692
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1206	-	337	692
Mov Cap-2 Maneuver	-	-	-	-	434	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	652	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.7	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	628	1206	-	-	-
HCM Lane V/C Ratio	0.111	0.063	-	-	-
HCM Control Delay (s)	11.4	8.2	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Intersection Delay, s/veh	24.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	30	344	19	55	19	280	98	0	11	174	82
Future Vol, veh/h	57	30	344	19	55	19	280	98	0	11	174	82
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.83	0.83	0.83	0.70	0.70	0.70
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	4	4	4
Mvmt Flow	62	33	374	25	73	25	337	118	0	16	249	117
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	23.4	16.1	32.7	19.2
HCM LOS	C	C	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	20%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	59%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	20%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	98	0	57	30	344	93	11	174	82
LT Vol	280	0	0	57	0	0	19	11	0	0
Through Vol	0	98	0	0	30	0	55	0	174	0
RT Vol	0	0	0	0	0	344	19	0	0	82
Lane Flow Rate	337	118	0	62	33	374	124	16	249	117
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.811	0.267	0	0.143	0.071	0.725	0.316	0.039	0.585	0.252
Departure Headway (Hd)	8.652	8.137	8.137	8.315	7.803	7.104	9.162	8.994	8.479	7.757
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	422	444	0	433	461	512	393	399	428	464
Service Time	6.355	5.84	5.84	6.034	5.522	4.804	6.905	6.73	6.214	5.492
HCM Lane V/C Ratio	0.799	0.266	0	0.143	0.072	0.73	0.316	0.04	0.582	0.252
HCM Control Delay	39.3	13.8	10.8	12.4	11.1	26.3	16.1	12.1	22.5	13.1
HCM Lane LOS	E	B	N	B	B	D	C	B	C	B
HCM 95th-tile Q	7.4	1.1	0	0.5	0.2	5.9	1.3	0.1	3.6	1

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	615
Total Delay (hr)	0
Stops (#)	24
Average Speed (mph)	35
Total Travel Time (hr)	2
Distance Traveled (mi)	65
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.2
CO Emissions (kg)	0.18
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	675
Total Delay (hr)	0
Stops (#)	65
Average Speed (mph)	34
Total Travel Time (hr)	4
Distance Traveled (mi)	142
Fuel Consumed (gal)	6
Fuel Economy (mpg)	24.9
CO Emissions (kg)	0.40
NOx Emissions (kg)	0.08
VOC Emissions (kg)	0.09

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1074
Total Delay (hr)	0
Stops (#)	1074
Average Speed (mph)	33
Total Travel Time (hr)	8
Distance Traveled (mi)	250
Fuel Consumed (gal)	17
Fuel Economy (mpg)	15.0
CO Emissions (kg)	1.17
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.27

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	616
Total Delay (hr)	0
Stops (#)	33
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	69
Fuel Consumed (gal)	3
Fuel Economy (mpg)	24.9
CO Emissions (kg)	0.19
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	679
Total Delay (hr)	0
Stops (#)	61
Average Speed (mph)	37
Total Travel Time (hr)	3
Distance Traveled (mi)	127
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.6
CO Emissions (kg)	0.35
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.08

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1087
Total Delay (hr)	0
Stops (#)	1087
Average Speed (mph)	33
Total Travel Time (hr)	8
Distance Traveled (mi)	262
Fuel Consumed (gal)	17
Fuel Economy (mpg)	15.1
CO Emissions (kg)	1.21
NOx Emissions (kg)	0.24
VOC Emissions (kg)	0.28

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	585
Total Delay (hr)	0
Stops (#)	28
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	67
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.4
CO Emissions (kg)	0.18
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.04

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	674
Total Delay (hr)	0
Stops (#)	64
Average Speed (mph)	37
Total Travel Time (hr)	3
Distance Traveled (mi)	124
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.1
CO Emissions (kg)	0.35
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.08

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1168
Total Delay (hr)	0
Stops (#)	1168
Average Speed (mph)	33
Total Travel Time (hr)	8
Distance Traveled (mi)	277
Fuel Consumed (gal)	19
Fuel Economy (mpg)	14.9
CO Emissions (kg)	1.30
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.30

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	30
Average Queue (ft)	5	15
95th Queue (ft)	23	39
Link Distance (ft)		414
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	56
Average Queue (ft)	7	31
95th Queue (ft)	28	55
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	75	70	98	71	118	74	40	76
Average Queue (ft)	27	35	59	41	59	42	3	34
95th Queue (ft)	55	62	94	65	96	69	19	71
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0	0	2			1		
Queuing Penalty (veh)	0	0	3			2		

Network Summary

Network wide Queuing Penalty: 6

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	30	29
Average Queue (ft)	4	20
95th Queue (ft)	20	40
Link Distance (ft)		420
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	28	53
Average Queue (ft)	4	29
95th Queue (ft)	21	51
Link Distance (ft)		421
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	51	51	74	55	139	134	40	77
Average Queue (ft)	27	21	51	32	64	49	3	42
95th Queue (ft)	47	45	77	44	113	91	17	70
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0	0	1			1		
Queuing Penalty (veh)	0	0	1			3		

Network Summary

Network wide Queuing Penalty: 4

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	49
Average Queue (ft)	1	17
95th Queue (ft)	10	41
Link Distance (ft)		416
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	51	72
Average Queue (ft)	18	30
95th Queue (ft)	42	55
Link Distance (ft)		451
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	52	28	171	55	121	75	24	114
Average Queue (ft)	24	19	56	36	60	34	10	52
95th Queue (ft)	48	39	103	58	96	64	29	90
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0		3			0		0
Queuing Penalty (veh)	0		2			1		0

Network Summary

Network wide Queuing Penalty: 4

Appendix G: Cumulative Year 2040 plus Project Traffic Conditions

Intersection	
Int Delay, s/veh	0.7

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	268	21	23	347	14	12
Future Vol, veh/h	268	21	23	347	14	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	305	24	26	394	16	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	329	0	763	317
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	446	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1225	-	372	724
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1225	-	364	724
Mov Cap-2 Maneuver	-	-	-	-	468	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	645	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	559	1225	-	-	-
HCM Lane V/C Ratio	0.053	0.021	-	-	-
HCM Control Delay (s)	11.8	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	272	8	41	358	11	54
Future Vol, veh/h	272	8	41	358	11	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	92	92
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	309	9	47	407	12	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	318	0	815	314
Stage 1	-	-	-	-	314	-
Stage 2	-	-	-	-	501	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1236	-	347	726
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1236	-	334	726
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	609	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.8	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	652	1236	-	-	-
HCM Lane V/C Ratio	0.108	0.038	-	-	-
HCM Control Delay (s)	11.2	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

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	61	103	237	22	89	24	315	131	1	9	112	64
Future Vol, veh/h	61	103	237	22	89	24	315	131	1	9	112	64
Peak Hour Factor	0.88	0.88	0.88	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.88	0.88
Heavy Vehicles, %	4	4	4	2	2	2	5	5	5	16	16	16
Mvmt Flow	69	117	269	24	99	27	354	147	1	10	127	73
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	14.2	15	27.9	13.8
HCM LOS	B	B	D	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	16%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	66%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	18%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	315	131	1	61	103	237	135	9	112	64
LT Vol	315	0	0	61	0	0	22	9	0	0
Through Vol	0	131	0	0	103	0	89	0	112	0
RT Vol	0	0	1	0	0	237	24	0	0	64
Lane Flow Rate	354	147	1	69	117	269	150	10	127	73
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.782	0.305	0.002	0.15	0.237	0.493	0.338	0.026	0.3	0.157
Departure Headway (Hd)	7.959	7.448	6.733	7.797	7.292	6.585	8.119	9	8.485	7.765
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	453	481	530	460	492	547	443	397	423	460
Service Time	5.717	5.206	4.49	5.548	5.043	4.335	5.883	6.769	6.254	5.533
HCM Lane V/C Ratio	0.781	0.306	0.002	0.15	0.238	0.492	0.339	0.025	0.3	0.159
HCM Control Delay	34	13.5	9.5	11.9	12.3	15.6	15	12	14.9	12
HCM Lane LOS	D	B	A	B	B	C	B	B	B	B
HCM 95th-tile Q	6.9	1.3	0	0.5	0.9	2.7	1.5	0.1	1.2	0.6

Intersection	
Int Delay, s/veh	0.8

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	328	13	14	301	15	19
Future Vol, veh/h	328	13	14	301	15	19
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	373	15	16	342	17	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	390	0	757	383
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1169	-	375	664
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1167	-	369	663
Mov Cap-2 Maneuver	-	-	-	-	478	-
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	696	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	566	1167	-	-	-
HCM Lane V/C Ratio	0.068	0.014	-	-	-
HCM Control Delay (s)	11.8	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	339	7	40	304	11	50
Future Vol, veh/h	339	7	40	304	11	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	385	8	45	345	12	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	393	0	824	389
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	435	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1166	-	343	659
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1166	-	330	659
Mov Cap-2 Maneuver	-	-	-	-	439	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	653	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	604	1166	-	-	-
HCM Lane V/C Ratio	0.11	0.039	-	-	-
HCM Control Delay (s)	11.7	8.2	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	19.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	60	349	20	64	12	277	166	5	8	127	62
Future Vol, veh/h	50	60	349	20	64	12	277	166	5	8	127	62
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	1	1	1	1	1	1	6	6	6	12	12	12
Mvmt Flow	54	65	379	23	73	14	315	189	6	9	144	70
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	19	13.8	22.5	14
HCM LOS	C	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	21%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	67%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	277	166	5	50	60	349	96	8	127	62
LT Vol	277	0	0	50	0	0	20	8	0	0
Through Vol	0	166	0	0	60	0	64	0	127	0
RT Vol	0	0	5	0	0	349	12	0	0	62
Lane Flow Rate	315	189	6	54	65	379	109	9	144	70
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.698	0.391	0.011	0.115	0.129	0.675	0.25	0.022	0.335	0.149
Departure Headway (Hd)	7.981	7.47	6.755	7.62	7.116	6.41	8.261	8.859	8.345	7.625
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	453	481	529	471	504	565	434	404	430	469
Service Time	5.733	5.222	4.507	5.363	4.859	4.153	6.023	6.623	6.109	5.389
HCM Lane V/C Ratio	0.695	0.393	0.011	0.115	0.129	0.671	0.251	0.022	0.335	0.149
HCM Control Delay	27.3	15	9.6	11.4	10.9	21.5	13.8	11.8	15.3	11.7
HCM Lane LOS	D	B	A	B	B	C	B	B	C	B
HCM 95th-tile Q	5.3	1.8	0	0.4	0.4	5.1	1	0.1	1.5	0.5

Intersection	
Int Delay, s/veh	0.6

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	330	15	7	267	12	17
Future Vol, veh/h	330	15	7	267	12	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	375	17	8	303	14	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	392	0	703	384
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	319	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1172	-	404	664
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1172	-	401	664
Mov Cap-2 Maneuver	-	-	-	-	505	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	737	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.2	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	587	1172	-	-	-
HCM Lane V/C Ratio	0.056	0.007	-	-	-
HCM Control Delay (s)	11.5	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection						
Int Delay, s/veh	1.7					

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	333	13	63	264	11	53
Future Vol, veh/h	333	13	63	264	11	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	92	92
Heavy Vehicles, %	3	3	1	1	2	2
Mvmt Flow	378	15	72	300	12	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	393	0	830	386
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	444	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1171	-	340	662
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1171	-	319	662
Mov Cap-2 Maneuver	-	-	-	-	422	-
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	646	-

Approach	SE	NW	NE
HCM Control Delay, s	0	1.6	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	603	1171	-	-	-
HCM Lane V/C Ratio	0.115	0.061	-	-	-
HCM Control Delay (s)	11.7	8.3	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	-

Intersection	
Intersection Delay, s/veh	24.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	34	371	21	63	21	296	111	0	13	197	82
Future Vol, veh/h	57	34	371	21	63	21	296	111	0	13	197	82
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	4	4	4
Mvmt Flow	62	37	403	24	72	24	336	126	0	15	224	93
Number of Lanes	1	1	1	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	3
HCM Control Delay	25.6	15.7	31.1	17.9
HCM LOS	D	C	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	20%	100%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	60%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	0%	100%	20%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	296	111	0	57	34	371	105	13	197	82
LT Vol	296	0	0	57	0	0	21	13	0	0
Through Vol	0	111	0	0	34	0	63	0	197	0
RT Vol	0	0	0	0	0	371	21	0	0	82
Lane Flow Rate	336	126	0	62	37	403	119	15	224	93
Geometry Grp	8	8	8	7	7	7	8	8	8	8
Degree of Util (X)	0.799	0.282	0	0.139	0.078	0.767	0.301	0.037	0.531	0.202
Departure Headway (Hd)	8.553	8.039	8.039	8.185	7.674	6.958	9.081	9.059	8.543	7.82
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	424	449	0	441	470	524	397	397	423	460
Service Time	6.264	5.75	5.75	5.885	5.374	4.658	6.813	6.776	6.26	5.537
HCM Lane V/C Ratio	0.792	0.281	0	0.141	0.079	0.769	0.3	0.038	0.53	0.202
HCM Control Delay	37.6	13.9	10.8	12.2	11	29	15.7	12.1	20.5	12.5
HCM Lane LOS	E	B	N	B	B	D	C	B	C	B
HCM 95th-tile Q	7.1	1.1	0	0.5	0.3	6.8	1.2	0.1	3	0.7

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	686
Total Delay (hr)	0
Stops (#)	26
Average Speed (mph)	35
Total Travel Time (hr)	2
Distance Traveled (mi)	72
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.2
CO Emissions (kg)	0.20
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.05

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	744
Total Delay (hr)	0
Stops (#)	65
Average Speed (mph)	35
Total Travel Time (hr)	5
Distance Traveled (mi)	157
Fuel Consumed (gal)	6
Fuel Economy (mpg)	25.0
CO Emissions (kg)	0.44
NOx Emissions (kg)	0.09
VOC Emissions (kg)	0.10

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1168
Total Delay (hr)	0
Stops (#)	1168
Average Speed (mph)	32
Total Travel Time (hr)	8
Distance Traveled (mi)	270
Fuel Consumed (gal)	18
Fuel Economy (mpg)	14.9
CO Emissions (kg)	1.26
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.29

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	690
Total Delay (hr)	0
Stops (#)	34
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	78
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.1
CO Emissions (kg)	0.22
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.05

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	751
Total Delay (hr)	0
Stops (#)	61
Average Speed (mph)	37
Total Travel Time (hr)	4
Distance Traveled (mi)	141
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.8
CO Emissions (kg)	0.38
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.09

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1201
Total Delay (hr)	0
Stops (#)	1201
Average Speed (mph)	33
Total Travel Time (hr)	9
Distance Traveled (mi)	288
Fuel Consumed (gal)	19
Fuel Economy (mpg)	15.1
CO Emissions (kg)	1.34
NOx Emissions (kg)	0.26
VOC Emissions (kg)	0.31

1: Brown Bear Lane & State Route 49

Direction	All
Future Volume (vph)	648
Total Delay (hr)	0
Stops (#)	29
Average Speed (mph)	36
Total Travel Time (hr)	2
Distance Traveled (mi)	74
Fuel Consumed (gal)	3
Fuel Economy (mpg)	25.5
CO Emissions (kg)	0.20
NOx Emissions (kg)	0.04
VOC Emissions (kg)	0.05

2: Project Driveway & State Route 49

Direction	All
Future Volume (vph)	737
Total Delay (hr)	0
Stops (#)	64
Average Speed (mph)	37
Total Travel Time (hr)	4
Distance Traveled (mi)	135
Fuel Consumed (gal)	5
Fuel Economy (mpg)	25.2
CO Emissions (kg)	0.37
NOx Emissions (kg)	0.07
VOC Emissions (kg)	0.09

3: State Route 140 & State Route 49/Jones St

Direction	All
Future Volume (vph)	1267
Total Delay (hr)	0
Stops (#)	1267
Average Speed (mph)	33
Total Travel Time (hr)	9
Distance Traveled (mi)	299
Fuel Consumed (gal)	20
Fuel Economy (mpg)	14.9
CO Emissions (kg)	1.40
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.32

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	31	30
Average Queue (ft)	3	19
95th Queue (ft)	18	42
Link Distance (ft)		414
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	32	79
Average Queue (ft)	14	32
95th Queue (ft)	39	56
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T	R
Maximum Queue (ft)	53	52	95	102	204	78	24	116	125
Average Queue (ft)	27	29	54	45	72	41	5	50	4
95th Queue (ft)	52	45	83	79	141	64	21	85	41
Link Distance (ft)		490		622		977		831	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	70		70		180		145		120
Storage Blk Time (%)	0	0	1		1	0		0	1
Queuing Penalty (veh)	0	0	2		1	1		0	1

Network Summary

Network wide Queuing Penalty: 5

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	28	29
Average Queue (ft)	4	16
95th Queue (ft)	19	38
Link Distance (ft)		420
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	27	52
Average Queue (ft)	8	28
95th Queue (ft)	28	48
Link Distance (ft)		421
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T	R
Maximum Queue (ft)	53	50	150	55	164	120	24	87	119
Average Queue (ft)	29	23	59	35	69	52	3	47	4
95th Queue (ft)	46	42	102	54	114	93	15	75	39
Link Distance (ft)		490		622		977		831	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	70		70		180		145		120
Storage Blk Time (%)	0		3		0	2			0
Queuing Penalty (veh)	0		4		0	5			0

Network Summary

Network wide Queuing Penalty: 9

Intersection: 1: Brown Bear Lane & State Route 49

Movement	NE
Directions Served	LR
Maximum Queue (ft)	49
Average Queue (ft)	17
95th Queue (ft)	42
Link Distance (ft)	416
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Project Driveway & State Route 49

Movement	NW	NE
Directions Served	L	LR
Maximum Queue (ft)	50	90
Average Queue (ft)	12	29
95th Queue (ft)	37	60
Link Distance (ft)		451
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 3: State Route 140 & State Route 49/Jones St

Movement	EB	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	R	LTR	L	T	L	T
Maximum Queue (ft)	51	28	129	56	135	74	24	111
Average Queue (ft)	25	18	69	35	69	37	10	52
95th Queue (ft)	48	38	111	55	109	63	29	84
Link Distance (ft)		490		622		977		831
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	70		70		180		145	
Storage Blk Time (%)	0		7			0		0
Queuing Penalty (veh)	0		6			0		0

Network Summary

Network wide Queuing Penalty: 7

Appendix H: Signal Warrants

Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet

DIST	CO	RTE	KPM
010	MARIPOSA	n/a	n/a

COUNT DATE 09/07/18
CALC MM DATE 05/26/20
CHK JB/SM DATE 06/12/20

Major St: **State Route 140** — Critical Approach Speed 35 MPH
Minor St: **State Route 49** — Critical Approach Speed 35 MPH

Critical speed of major street traffic > 64 km/h (40 mph)................. ☐
or
In built up area of isolated community of < 10,000 population .... ☑ } RURAL (R)
☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

70% SATISFIED YES ☑ NO ☐
56% SATISFIED YES ☑ NO ☐

MINIMUM REQUIREMENTS (56% SHOWN IN BRACKETS)

APPROACH LANES	U (1)	R (1)	U (2 or More)	R (2 or More)	8:00 AM	9:00 AM	10:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM
Both Approaches	500	350	600	420	492	541	543	512	493	473	525	523
Major Street	(400)	(280)	(480)	(336)	492	541	543	512	493	473	525	523
Highest Approach	150	105	200	140	256	247	248	273	289	270	239	293
Minor Street	(120)	(84)	(160)	(112)	256	247	248	273	289	270	239	293

Condition B - Interruption of Continuous Traffic

70% SATISFIED YES ☐ NO ☑
56% SATISFIED YES ☑ NO ☐

MINIMUM REQUIREMENTS (56% SHOWN IN BRACKETS)

APPROACH LANES	U (1)	R (1)	U (2 or More)	R (2 or More)	8:00 AM	9:00 AM	10:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM
Both Approaches	750	525	900	630	492	541	543	512	493	473	525	523
Major Street	(600)	(420)	(720)	(504)	492	541	543	512	493	473	525	523
Highest Approach	75	53	100	70	256	247	248	273	289	270	239	293
Minor Street	(60)	(42)	(80)	(56)	256	247	248	273	289	270	239	293

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Combination of Conditions A & B **SATISFIED** YES ☑ NO ☐

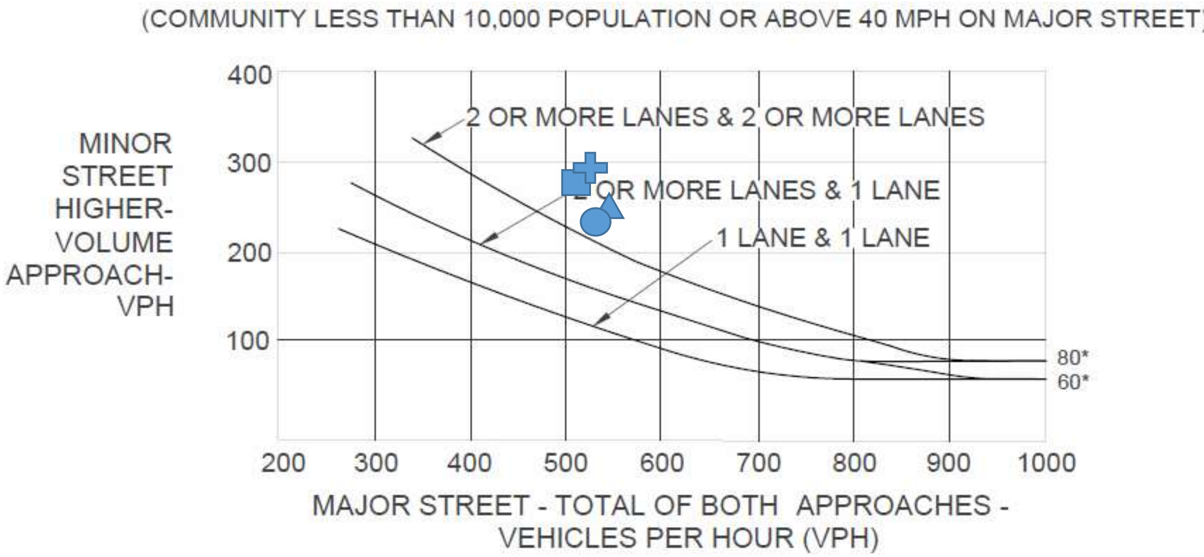
REQUIREMENT	WARRANT	FULFILLED
WARRANTS SATISFIED 56%	1. MINIMUM VEHICULAR VOLUME	Yes ☑ No ☐
	2. INTERRUPTION OF CONTINUOUS TRAFFIC	

JLB TRAFFIC ENGINEERING, INC.
www.JLBtraffic.com
info@JLBtraffic.com
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570 - 8991

Warrant 2: Four-Hour Vehicular Volume (Rural)

Existing Traffic Conditions

3. State Route 140 / State Route 49



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor street approach with one lane.

	1 Lane & 1 Lane	2 or More Lanes & 1 Lane	2 or More Lanes & 2 or More Lanes	▲ 9:00 AM Volume	■ 12:00 PM Volume	● 3:00 PM Volume	✚ 4:00 PM Volume
State Route 140 (Total of Both Approaches)	☑	☐	☐	541	512	525	523
State Route 49 (Higher Volume Approach)				247	273	239	293

Satisfied: ☑ **Yes** ☐ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Rural)

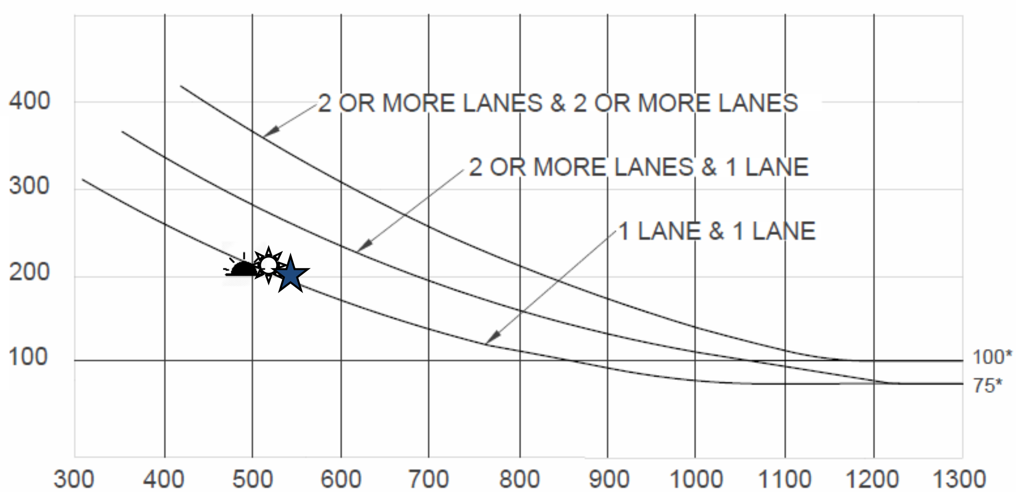
Existing Traffic Conditions
3. State Route 140 / State Route 49
AM [MD] (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)

State Route 49

Highest Approach Volume =

204 [208] (198) VPH



State Route 140 Total of Both Approaches =

493 [511] (537) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

MD Peak Hour – Signal Warrant is Met

PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 4: Pedestrian Volume (Peak Hour 70%)

Existing Traffic Conditions

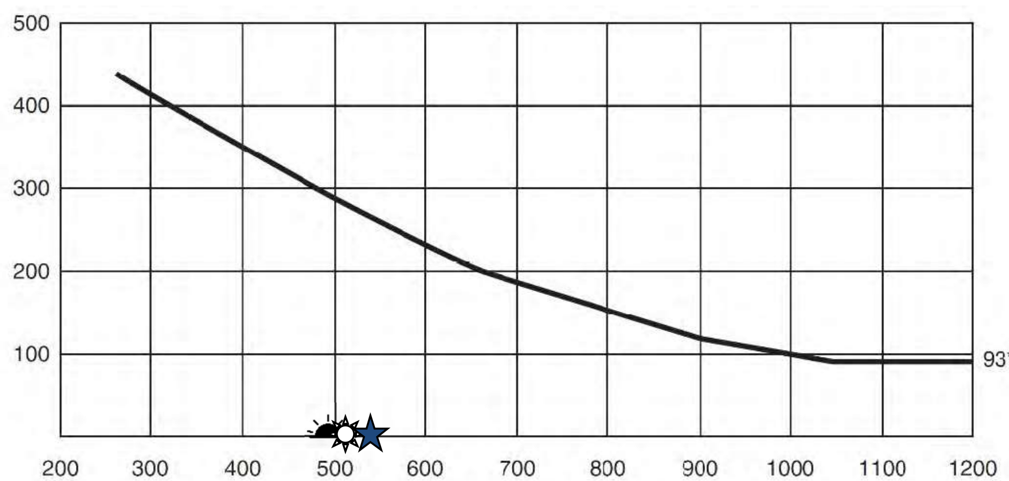
3. State Route 140 / State Route 49

AM [MD] (PM) Peak Hour

Total of All Pedestrians Crossing

State Route 140 =

8 [2] (1) PPH



State Route 140 Total of Both Approaches =

493 [511] (537) VPH

*Note: 93 pph applies as the lower threshold volume.

AM Peak Hour – Signal Warrant is Not Met

MD Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 7: Crash Experience

Existing Traffic Conditions
3. State Route 140 / State Route 49

(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☒
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☒
5 OR MORE	3 Crashes		
REQUIREMENTS	CONDITIONS	✓	Yes ☒ No ☐
ONE CONDITION SATISFIED 70%	Warrant 1, Condition A - Minimum Vehicular Volume	✓	
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic	☐	
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 throught Figure 4C-8	☐	

Satisfied: ☐ **Yes** ☒ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 8: Roadway Network

Existing Traffic Conditions
3. State Route 140 / State Route 49

(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES		✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour 962 Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		☐	Yes ☐ No ☒
	OR During Each of Any 5 Hrs. of a Sat. or Sun —— Veh/Hr		☐	
CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B		
Hwy. System Serving as Principal Network for Through Traffic	✓	✓		
Rural or Suburban Highway Outside Of, Entering, or Traversing a City	✓	✓		
Appears as Major Route on an Official Plan	✓	✓		
Any Major Route Characteristics Met, Both Streets				Yes ☒ No ☐

Satisfied: ☐ **Yes** ☒ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

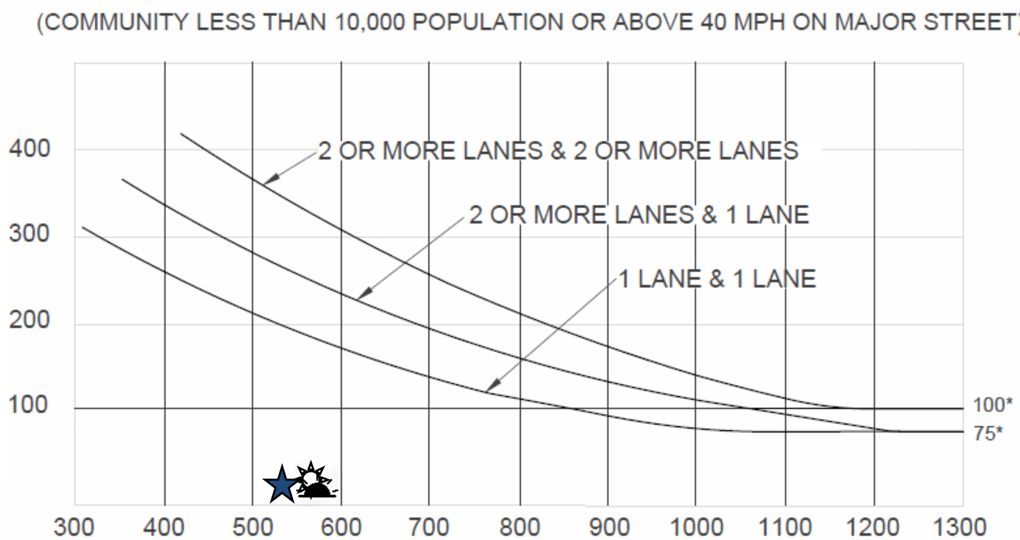
Warrant 3: Peak Hour (Rural)

Opening Year 2022 plus Project Traffic Conditions
1. Brown Bear Lane / State Route 49
AM [MD] (PM) Peak Hour

Brown Bear Lane

Highest Approach Volume =

19 [24] (20) VPH



State Route 49 Total of Both Approaches =

574 [571] (540) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

MD Peak Hour – Signal Warrant is Not Met

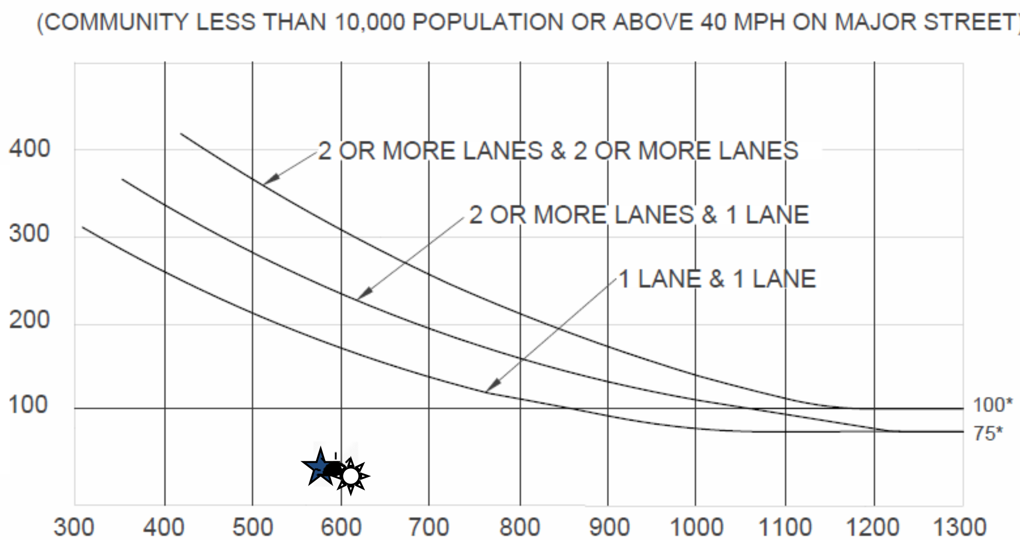
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Rural)

Opening Year 2022 plus Project Traffic Conditions
2. Project Driveway / State Route 49
AM [MD] (PM) Peak Hour

Project Driveway Highest Approach Volume = 38 [36] (38) VPH



State Route 49 Total of Both Approaches = 595 [604] (594) VPH

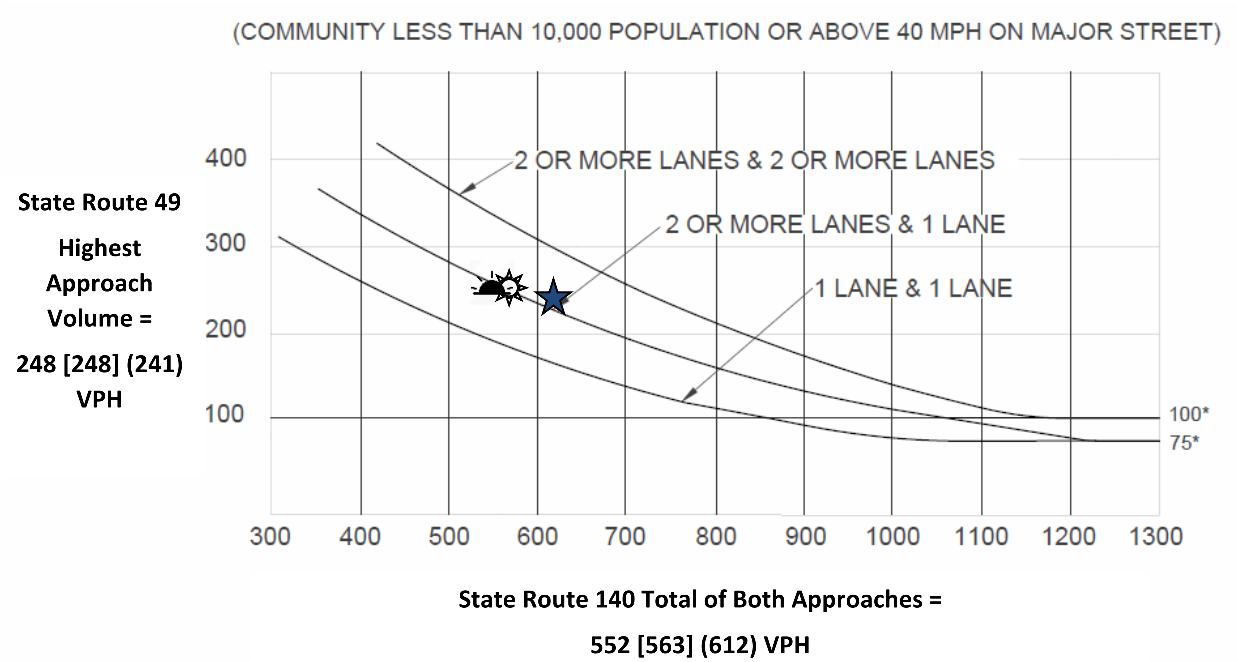
*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met
MD Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Rural)

Opening Year 2022 plus Project Traffic Conditions
3. State Route 140 / State Route 49
AM [MD] (PM) Peak Hour



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Met
MD Peak Hour – Signal Warrant is Met
PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

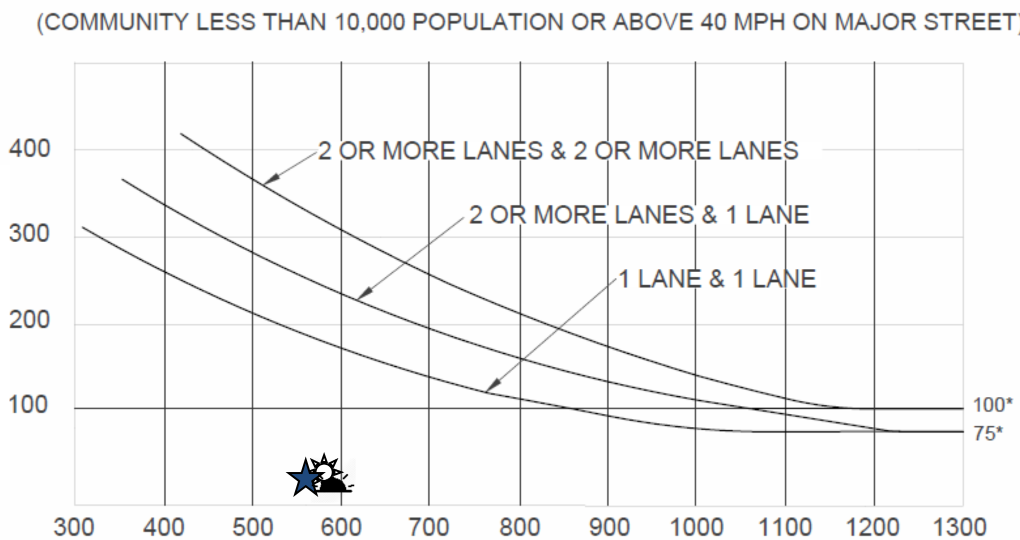
Warrant 3: Peak Hour (Rural)

Cumulative Year 2025 plus Project Traffic Conditions
1. Brown Bear Lane / State Route 49
AM [MD] (PM) Peak Hour

Brown Bear Lane

Highest Approach Volume =

19 [24] (20) VPH



State Route 49 Total of Both Approaches =

590 [583] (557) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

MD Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.

www.JLBtraffic.com

info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103

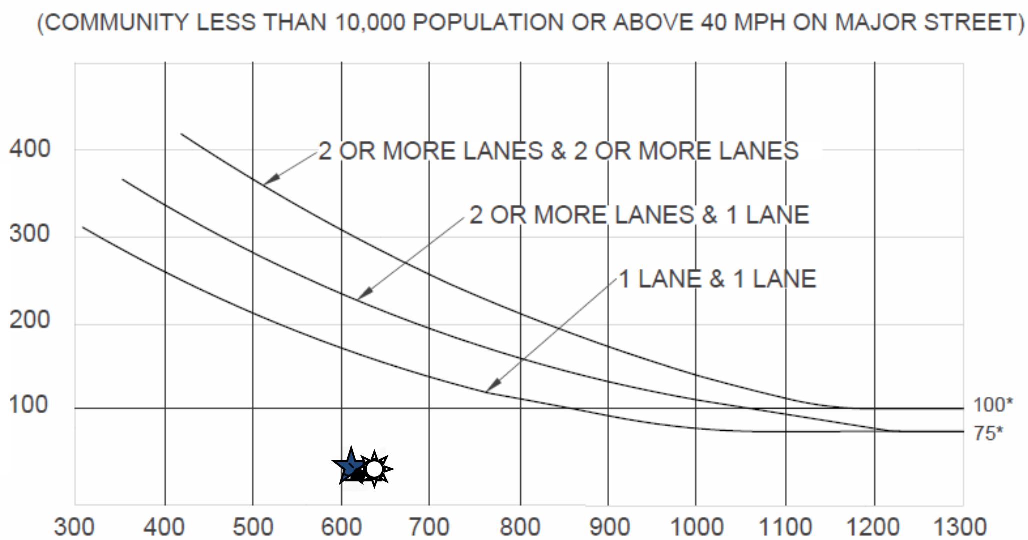
Fresno, CA 93704

(559) 570-8991

Warrant 3: Peak Hour (Rural)

Cumulative Year 2025 plus Project Traffic Conditions
2. Project Driveway / State Route 49
AM [MD] (PM) Peak Hour

Project Driveway Highest Approach Volume =
38 [36] (38) VPH



State Route 49 Total of Both Approaches =
611 [618] (610) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met
MD Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

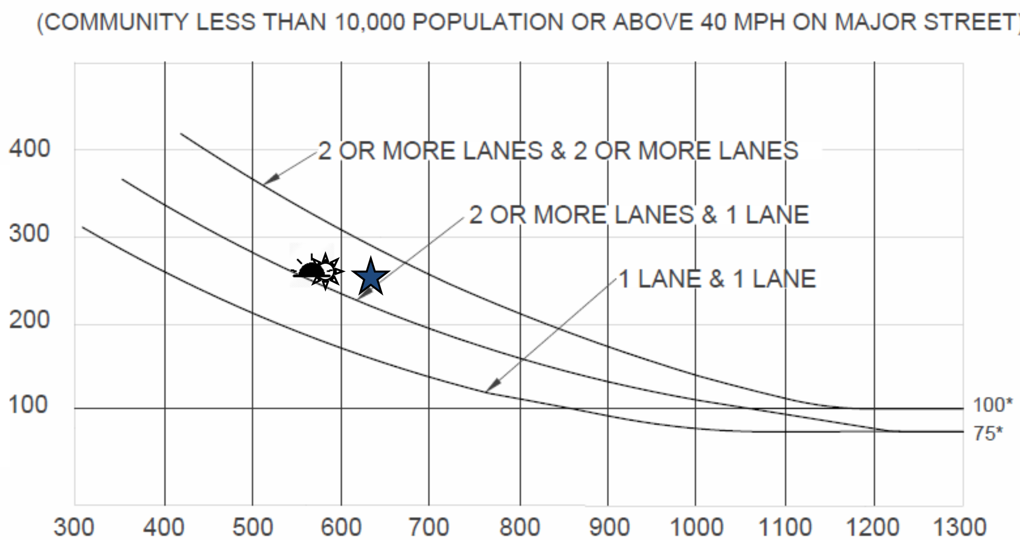
Warrant 3: Peak Hour (Rural)

Cumulative Year 2025 plus Project Traffic Conditions
3. State Route 140 / State Route 49
AM [MD] (PM) Peak Hour

State Route 49

Highest Approach Volume =

265 [262] (259) VPH



State Route 140 Total of Both Approaches =

577 [582] (645) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.


AM Peak Hour – Signal Warrant is Met


MD Peak Hour – Signal Warrant is Met


PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.

www.JLBtraffic.com

info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

(559) 570-8991

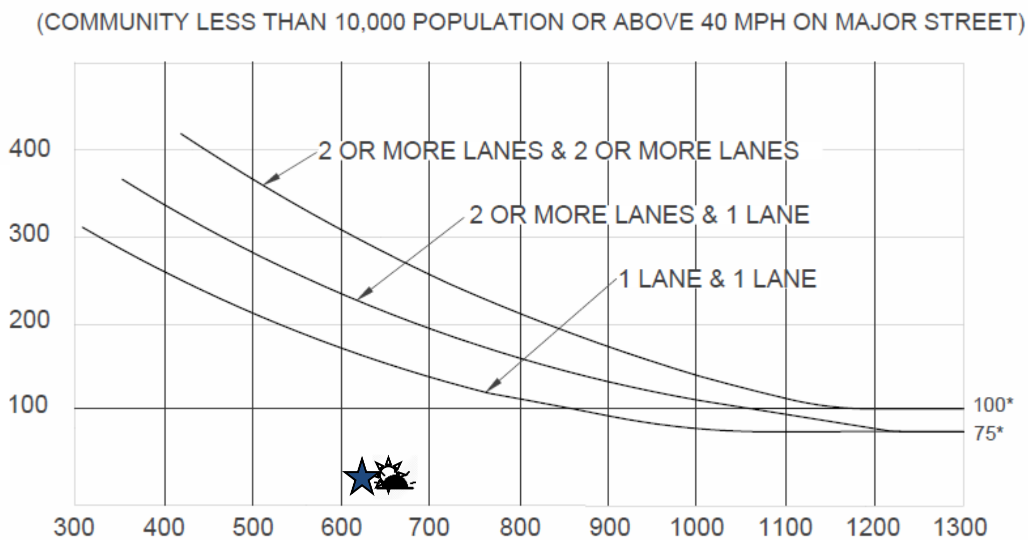
Warrant 3: Peak Hour (Rural)

Cumulative Year 2040 plus Project Traffic Conditions
1. Brown Bear Lane / State Route 49
AM [MD] (PM) Peak Hour

Brown Bear Lane

Highest Approach Volume =

20 [25] (21) VPH



State Route 49 Total of Both Approaches =

659 [656] (619) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met
MD Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

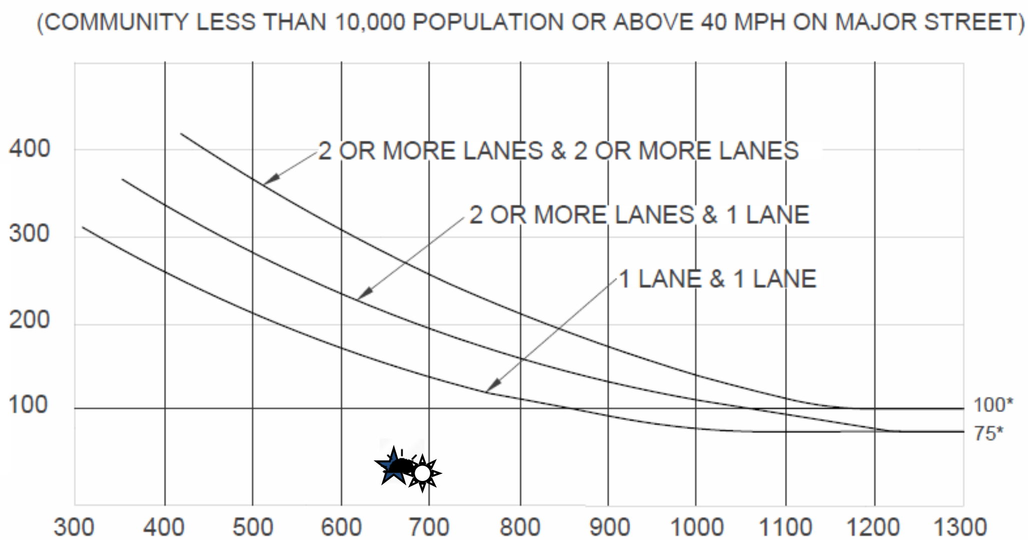
Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.
www.JLBtraffic.com
info@JLBtraffic.com
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Warrant 3: Peak Hour (Rural)

Cumulative Year 2040 plus Project Traffic Conditions
2. Project Driveway / State Route 49
AM [MD] (PM) Peak Hour

Project Driveway Highest Approach Volume = 38 [36] (38) VPH



State Route 49 Total of Both Approaches =

679 [690] (673) VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

MD Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.

www.JLBtraffic.com

info@JLBtraffic.com

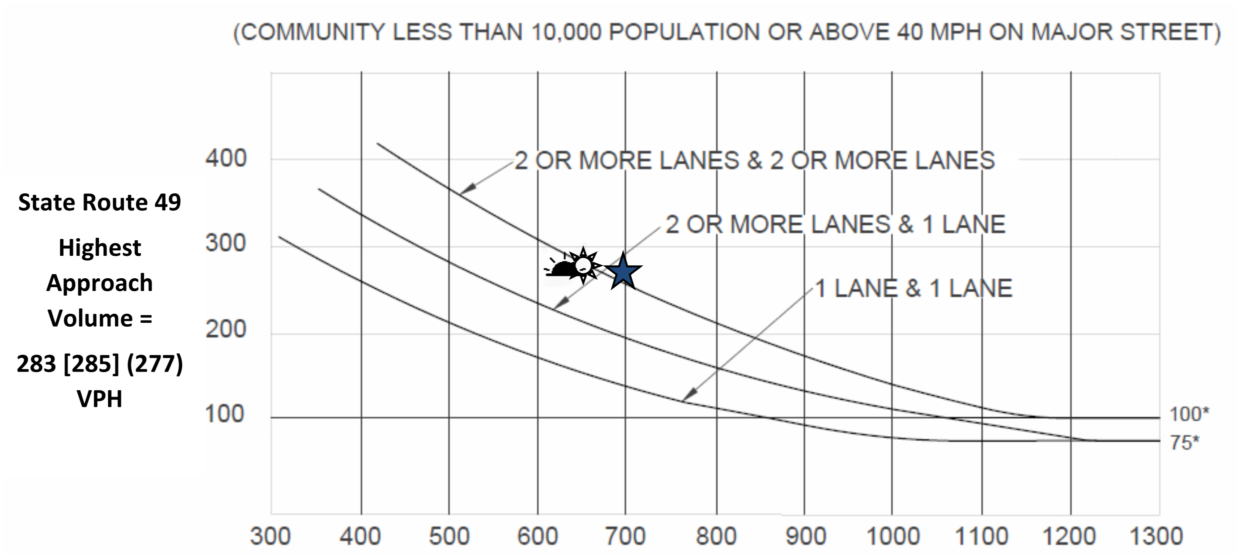
516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

(559) 570-8991

Warrant 3: Peak Hour (Rural)

Cumulative Year 2040 plus Project Traffic Conditions
3. State Route 140 / State Route 49
AM [MD] (PM) Peak Hour



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Met
MD Peak Hour – Signal Warrant is Met
PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.
www.JLBtraffic.com
info@JLBtraffic.com
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991