Item No. 16
Town of Atherton

CITY COUNCIL STAFF REPORT – REGULAR AGENDA

TO: **HONORABLE MAYOR AND CITY COUNCIL**
GEORGE RODERICKS, CITY MANAGER

FROM: **MICHAEL KASHIWAGI, P.E.**
COMMUNITY SERVICES DIRECTOR

DATE: **JANUARY 17, 2018**

SUBJECT: **REVIEW, DISCUSS AND PROVIDE DIRECTION REGARDING ENGINEERING ALTERNATIVES AND STAKEHOLDER FEEDBACK TO IMPROVE SAFETY AND OPERATIONS OF THE EL CAMINO REAL/SELBY LANE INTERSECTION**

RECOMMENDATION

Review, discuss, and provide direction regarding the results of engineering review and stakeholder feedback to improve safety and operations of the El Camino Real/Selby Lane intersection.

BACKGROUND

The intersection of Selby Lane and El Camino Real (ECR) has been identified by Caltrans as a location that would benefit from the installation of a traffic signal due to existing traffic volumes and accident history. According to accident information provided by Caltrans, during the 10-year period from 2002 – 2011, a total of 50 accidents were reported at the Selby Lane/ECR intersection. All reported accidents were vehicle related. There were no reported pedestrian or bicycle related accidents. The primary collision factor for approximately half of the accidents was failure to yield and improper turns. Approximately half of the accidents were cars being broadsided. Based upon this information, Caltrans informed the Town of Atherton this intersection met warrants for construction of a traffic signal.

Installation of a traffic signal would improve traffic operations and safety for vehicles, bicyclists, and pedestrians. However, due to concerns raised by residents regarding increased traffic on residential streets resulting from the installation of a traffic signal, City Council directed staff to investigate other alternatives to improve safety and operations of the intersection.

Since April 2015, the Town of Atherton, Caltrans, and San Mateo County have been engaged in discussions looking at a number of non-signalized alternatives to improve the safety and operations of the Selby/ECR intersection. The purpose was to identify alternatives that all three agencies could support. This meant identifying alternatives that were sensitive and respectful of neighborhood traffic concerns as well as alternatives that preserved the vehicular capacity and

operations of the ECR Corridor and existing traffic signal operations of the ECR and 5th Avenue intersection. Through this process, four non-signalized alternatives were developed and evaluated (Attachment A).

On February 26, 2016, a Community Workshop was held at Selby Elementary School. The purpose of the meeting was to share the four non-signalized concepts along with the traffic signal alternative to solicit community feedback and input. The meeting was broadly advertised to Atherton residents living in the vicinity of Selby Lane as well as adjacent Redwood City and San Mateo County residents. Based upon sign-in sheet information, there was a good representation of Town of Atherton, Redwood City, and San Mateo County residents attending the workshop.

Staff received a number of comments and concerns during the community workshop. After the presentation of concepts and response to questions, the attendees were asked to show their support or non-support of the alternatives. Through this process, two of the five alternatives emerged as the preferred options. These were the traffic signal alternative and non-signalized alternative, which would eliminate all existing turn movements except the northbound ECR left turn into Selby Lane (Alternative 1, Attachment A).

In order to determine the operational impacts of the two preferred options, additional engineering analysis and review was necessary. The focus of the additional engineering analysis was to address corridor and intersection operational impacts along ECR and to address neighborhood traffic concerns resulting from anticipated changes in traffic patterns and driver behavior resulting from the installation of a traffic signal or turning movement restrictions at the Selby Lane/ECR intersection.

In April 2016, City Council approved a contract amendment with Mark Thomas and Company to perform the additional analysis. The scope of services included collection of additional traffic volume and turning movement counts, operational analysis of impacted intersections, and origin/destination surveys to assess possible traffic diversion impacts of the signal and non-signalized alternatives. A draft report was completed in October 2016 and submitted to Caltrans for review.

DISCUSSION

In May 2017, the Town received minor comments from Caltrans based upon their review of the operational analysis. The operational analysis for both the traffic signal and Alternative 1 identified increased queue lengths, which exceeded the capacity of existing left turn pockets on ECR. These impacts are minor and could be addressed through engineering design and operational adjustments to the existing traffic signal at 5th Avenue/ECR. Caltrans indicated both alternatives would work, but preferred the signalized intersection alternative since they believe it would be a better solution for reducing vehicular collisions and would also provide a safer crossing for pedestrians. The Final Traffic Analysis Report is provided as Attachment B.

San Mateo County staff indicated support for the non-signalized alternative which maintains the ability to turn left from ECR into the portion of Selby Lane within San Mateo County. This option

is shown as Alternative 2 of Attachment A. Although an operational analysis was not performed on this alternative, it is believed that the impacts would be very similar to Alternative 1.

Two additional community meetings were held to share the results of the operational analysis on October 17, 2017 and December 4, 2017. Meetings were held at Selby Elementary School. Due to the number of agency stakeholders and resident interests potentially impacted by any changes to the existing intersection, meetings were broadly advertised to residents and businesses within the vicinity of Selby Lane in the Town of Atherton, San Mateo County, and Redwood City. Based upon sign-in sheet information, attendance for the 3 community meetings are summarized below:

	February 2016	October 2017	December 2017	Total
Town of Atherton	12	15	10	37
Redwood City	7	2	1	10
San Mateo County	11	6	4	21
Total	**30**	**23**	**15**	**68**

Resident feedback received during the community meetings were very mixed and there definitely was not consensus on a preferred alternative. Understandably, resident preference was largely based upon how they personally use and access the Selby Lane/ECR intersection and beliefs regarding traffic pattern changes, which would adversely impact their neighborhoods with implementation of any improvements.

Updated Accident Information

In November 2017, Town staff updated the 10-year accident history of the Selby Lane/ECR intersection. During this period, there were 69 reported accidents including 1 vehicular related fatality. There were 63 vehicular and 6 bicycle accidents. There were no reported pedestrian accidents. A summary of the vehicular accidents include:

- 45% rear end collisions
- 33% broadside collisions
- 30% resulted in injuries
- 1 fatality

Summary of Bicycle/Pedestrian Accidents

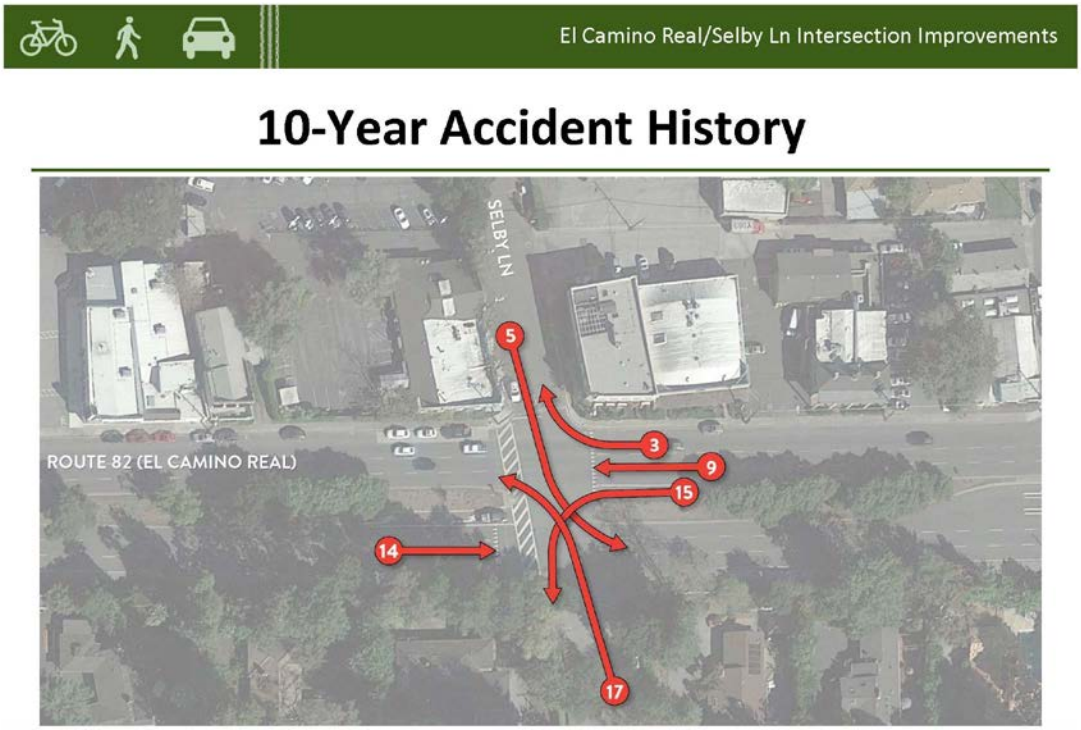
Staff also reviewed the 10-year history of bicycle and pedestrian accidents on the segment of ECR between Selby Lane and Stockbridge Avenue. During this period, there were 28 reported accidents including 1 fatality. The summary of accidents include:

- Selby Lane/ECR – 6 bicycle accidents
- 5th Avenue/ECR – 5 Bicycle/9 pedestrian accidents
- Amherst Avenue/ECR – 1 bicycle accident
- Stockbridge Avenue/ECR – 5 bicycle/2 pedestrian accidents

ANALYSIS

In the vicinity of Selby Lane, the average daily traffic volume of ECR is in excess of 37,000 vehicles per day. Poor visibility and lack of gaps in traffic due to the volume and speed of vehicles creates challenges for cars to safely make turning movements into and out of the Selby Lane intersection. The graphic below shows all possible vehicular and pedestrian movements at this uncontrolled intersection.

A review of the current 10-year history indicates a total of 63 reported accidents. This compares to the 50 accidents during the 10-year period from 2002 – 2011 reported by Caltrans. The number of accidents by vehicle movements is summarized in the 10-Year Accident History figure below. The graphic seems to suggest that most if not all accidents can be attributed to a turning vehicle movement.



Based upon review of the accident history, controlling and regulating the movement of vehicles by installation of a traffic signal or physically limiting the number of movements by utilizing raised medians would improve the safety and operations of the Selby Lane/ECR intersection. Although preferences and feedback from agency staff and residents were mixed, three specific alternatives have been identified, which would address the current safety concerns. The traffic signal alternative and Alternatives 1 and 2 shown in Attachment A.

The intersection of Selby Lane and ECR is under jurisdictional control of three separate agencies, Caltrans (El Camino Real), San Mateo County (east leg of Selby Lane) and the Town of Atherton (west leg of Selby Lane). Accordingly, implementation of any intersection improvements must be supported by all three agencies. Based upon feedback received from Caltrans and San Mateo County, the only alternative which satisfies this requirement is the non-signalized intersection improvement which restricts all intersection movements except left turns from ECR to both legs of Selby Lane (Alternative 2, Attachment A).

Although Caltrans prefers the traffic signal alternative since they believe it's a better solution for reducing vehicular collisions and provide a safer crossing for pedestrians and bicycles, the non-signalized alternative would probably be less controversial for the Selby Lane neighborhood.

POLICY FOCUS

Identification of a project to improve the operations and safety of the Selby Lane/ECR intersection is consistent with previous City Council direction and priorities to improve the safety and mobility of bicycles and pedestrians along and across ECR within the Town of Atherton.

FISCAL IMPACTS

There are no fiscal impacts. At this time, there is no funding source identified for proceeding with this project.

PUBLIC NOTICE

Public notification was achieved by posting the agenda, with this agenda item being listed, at least 72 hours prior to the meeting in print and electronically. Information about the project is also disseminated via the Town's electronic News Flash and Atherton Online. There are approximately 1,200 subscribers to the Town's electronic News Flash publications. Subscribers include residents as well as stakeholders – to include, but be not limited to, media outlets, school districts, Menlo Park Fire District, service provides (water, power, and sewer), and regional elected officials.

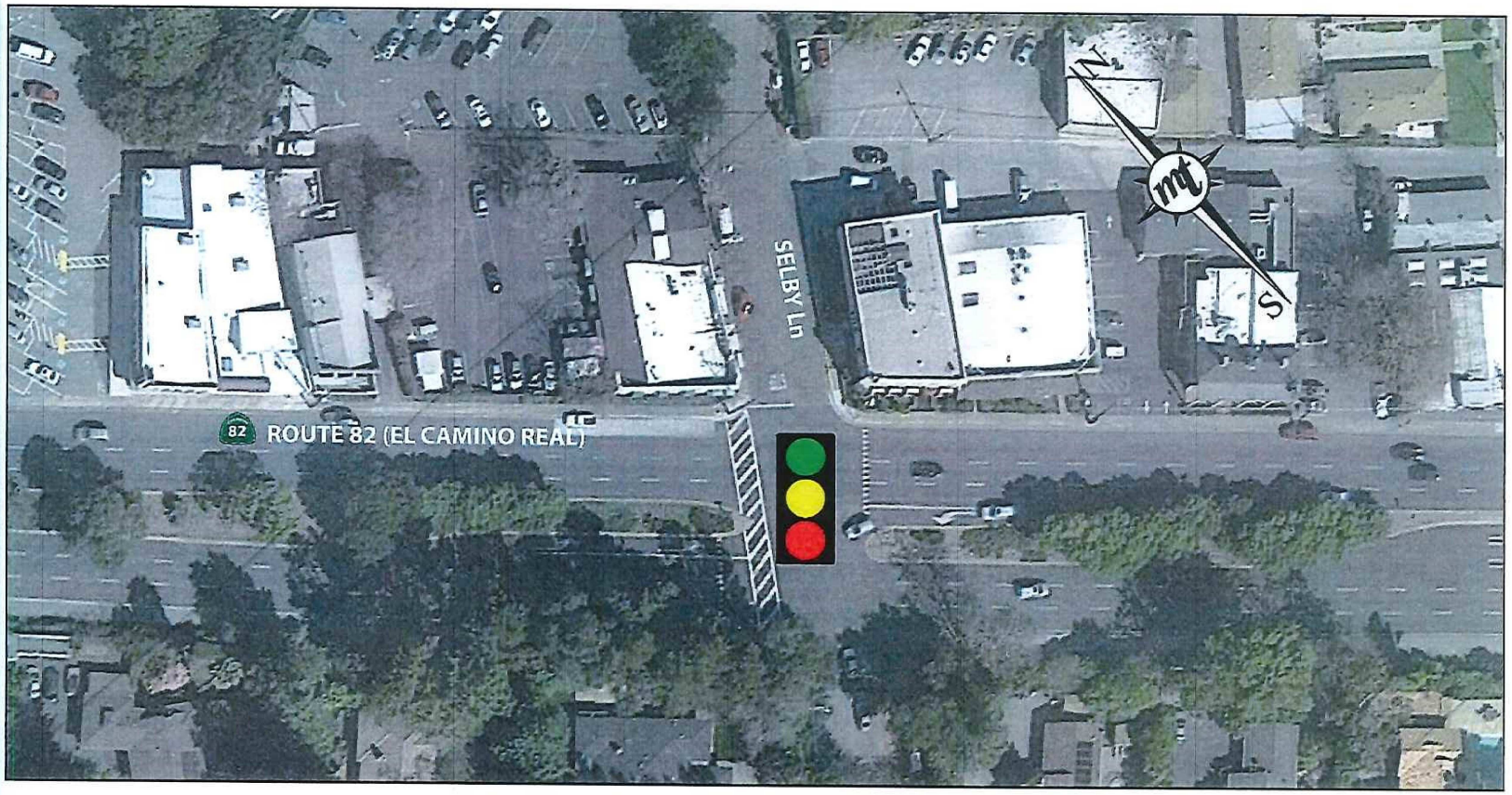
ATTACHMENTS

Attachment A – El Camino Real/Selby Lane Intersection Alternatives
Attachment B – Final Traffic Analysis Report

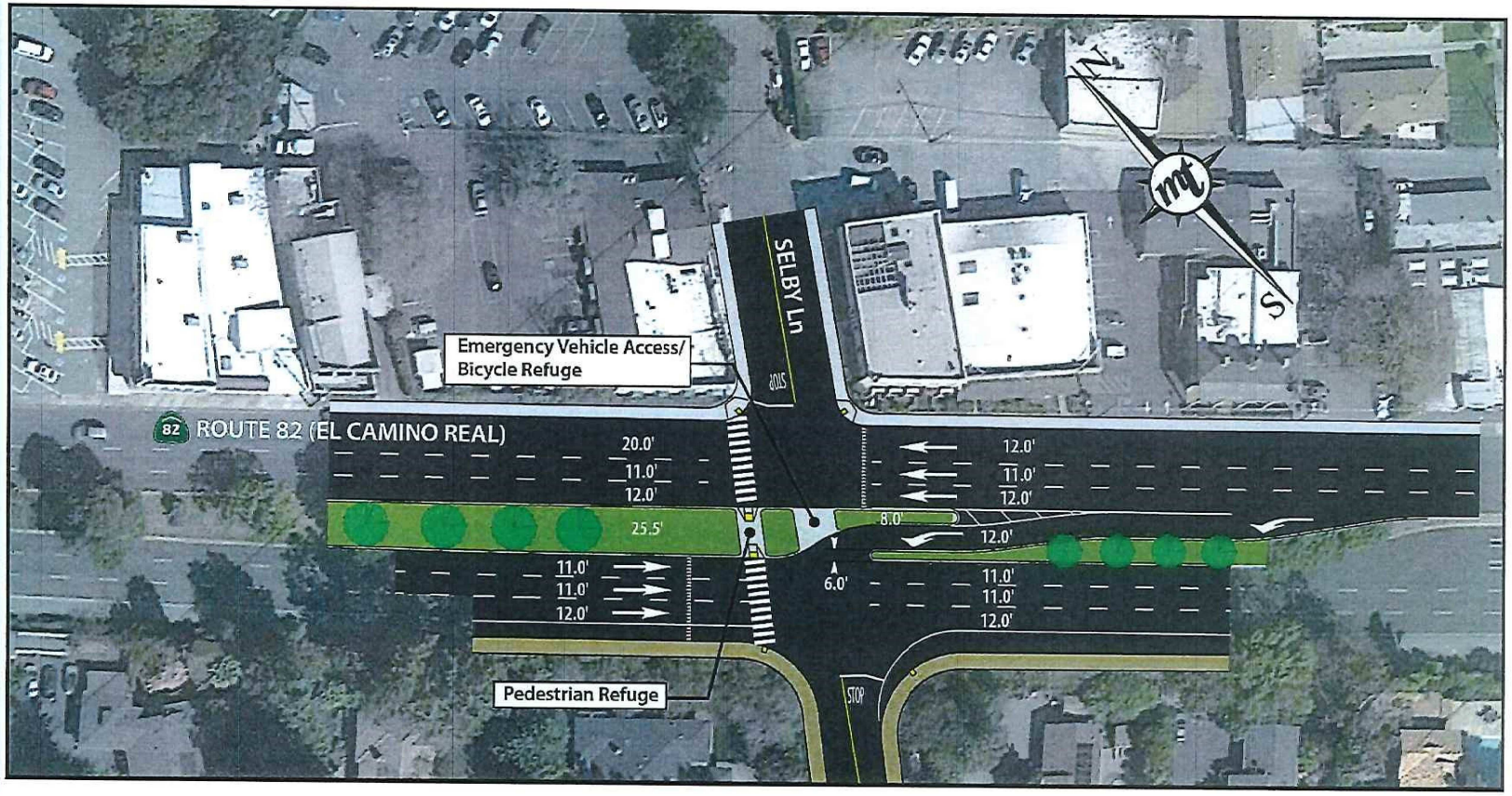
Attachment A

El Camino Real/Selby Lane
Intersection Alternatives

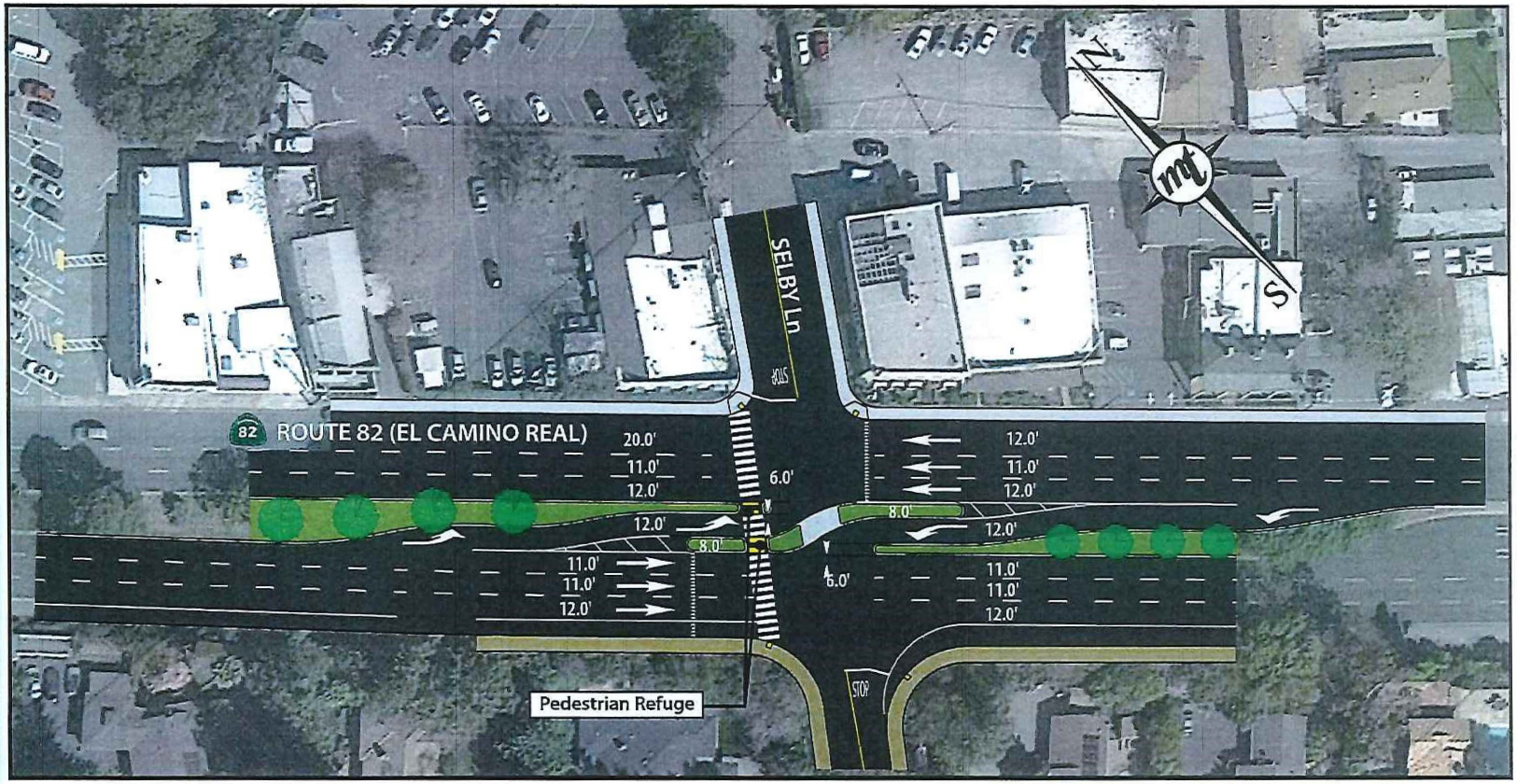
Signalization



Alternative 1



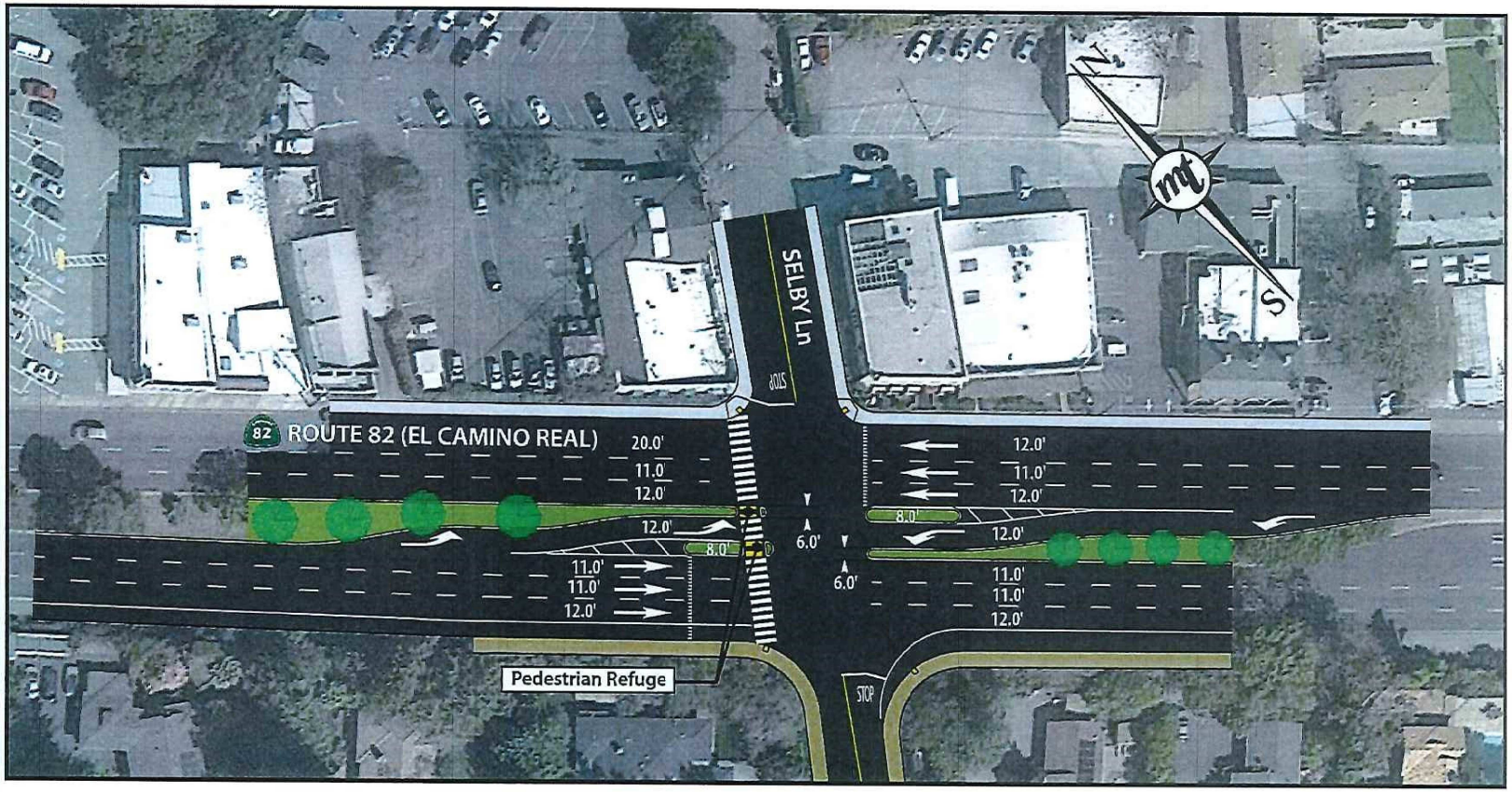
Alternative 2



Town of ATHERTON California

Alternative 3

Alternative 4



Town of ATHERTON California

Attachment B

Final Traffic Analysis Report

Town of Atherton

Selby Lane Bike Study

Final Traffic Analysis Report

Atherton, California

May 30, 2017

TJKM

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Appendix

INTRODUCTION

This report presents the analysis results of alternative improvements at the intersection of El Camino Real & Selby Lane in the Town of Atherton. Three alternative intersection modifications were evaluated in October 2015 to understand operational impacts to the surrounding traffic system. The three options were presented to the community and two alternatives that received the most support have been further analyzed in this study.

The following report summarizes a new analysis of the preferred alternatives utilizing data collected in May 2016 for vehicles, pedestrians, and bicycles. It also includes an expanded network of intersections compared with the original study, and evaluation of Selby Lane & El Camino Real as a signalized intersection. The purpose of this study is to determine the existing state of operations at six study intersections, and the projected impacts of two alternative intersection configurations. The project vicinity is illustrated in **Figure 1**, and the study intersections are listed below with their respective control types:

1. El Camino Real & Oakwood Drive-Dumbarton Avenue (Signal)
2. El Camino Real & Selby Lane (Two-Way Stop Control (TWSC))
3. El Camino Real & Fifth Avenue (Signal)
4. El Camino Real & Stockbridge Avenue (One-Way Stop Control (OWSC))
5. Oakwood Boulevard & Selby Lane (OWSC)
6. Waverly Avenue & Fifth Avenue (Signal)

The three scenarios evaluated in this report are as follows:

- Existing Conditions
  - Current intersection configurations and signal timings with 2016 traffic volumes
- Alternative 1 Conditions (Existing Volumes)
  - Restrict left-turns/through movements from Selby Lane onto/across El Camino Real
  - Restrict southbound left-turns from El Camino Real onto Selby Lane
- Alternative 2 Conditions (Existing Volumes)
  - Install signal at intersection of El Camino Real & Selby Lane

Vicinity Map and ADT Locations

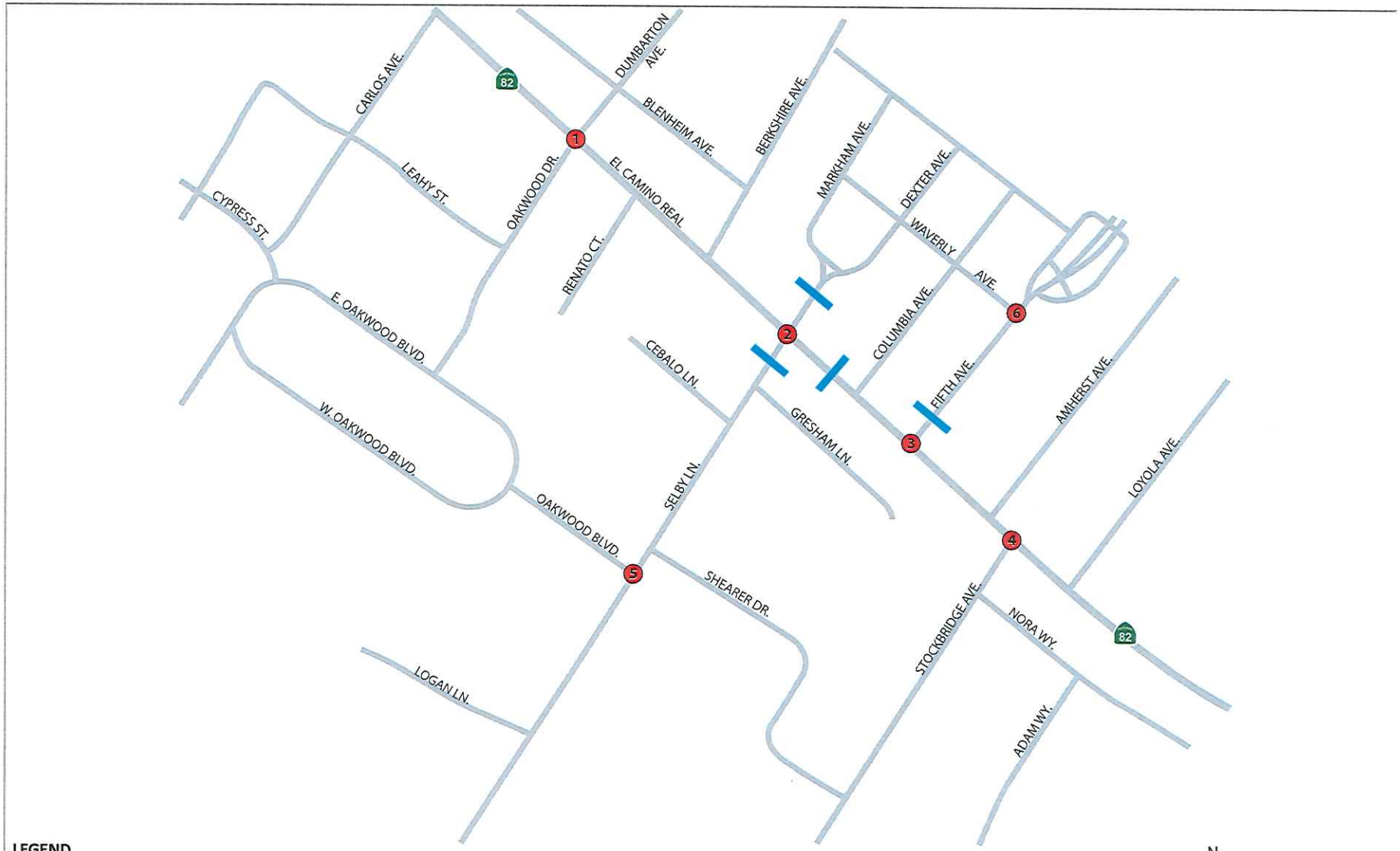

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Figure 1

STUDY METHODOLOGY

Level of Service Analysis Methodology

Traffic impacts on study intersections are quantified through the determination of level of service (LOS), a qualitative measure describing operational conditions within a traffic stream. There are six levels of service defined for signalized and unsignalized (e.g. Stop Control) intersections that are analyzed. LOS has letter designations ranging from A to F, with LOS A representing free flow traffic with little or no delay and LOS F representing jammed conditions with excessive delay and long back-ups. Procedures for analyzing intersection LOS are based on the Highway Capacity Manual 2000 (HCM 2000) methodology as described in detail in **Appendix A**. **Table 1** and **Table 2** present the levels of service and their descriptions.

Table 1: Signalized Intersection Level of Service Description

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both.
	Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: HCM 2000

Table 2: Unsignalized Intersection Level of Service Description

Level of Service	Description
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: HCM 2000

Level of Service Standards

The Town of Atherton does not have LOS standards defined for intersections, so the San Mateo County standards are the baseline for this study. The County utilizes a standard of overall LOS C with no individual movement operating at less than LOS D to be considered acceptable. The following discusses standards set forth by the County for intersections.

- Intersections in compliance with the LOS standard under existing conditions shall not operate at LOS D or worse as a result of a project.
- Intersections NOT in compliance with the LOS standard under existing conditions shall not operate at LOS D or worse and experience an increase in average control delay by four or more seconds as a result of the project. *(This condition stipulates that a nonconforming intersection (e.g. overall LOS D, E, or F; or Movement LOS E or F) may not operate at overall LOS D, E, or F if the resulting delay is four or more seconds longer than determined under Existing Conditions without a project.)*

Existing Conditions

This section of the report summarizes data collection efforts and the existing state of operations at the study intersections. The existing conditions data allowed development of a Synchro traffic model that provides basis for understanding impacts imposed by alternative improvement options.

Existing Roadway Network

California State Highway 82 (El Camino Real) is a surface highway with posted speed limit of 35 mph connecting Atherton residents to the north and south ends of the Peninsula. Within the study vicinity, the roadway provides three motor vehicle travel lanes in each direction and a continuous sidewalk along its eastern side. Sidewalk is provided on the west side of El Camino Real from Oakwood Drive to just south of Renato Court, where it becomes a pedestrian path at-grade with the roadway surface. Currently, there are no bicycle facilities on El Camino Real.

Dumbarton Avenue is an east-west local street with posted speed limit of 25 mph providing access between residential neighborhoods and El Camino Real. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction, on-street parking, continuous sidewalks on both sides, and no bicycle facilities.

Fifth Avenue is an east-west collector street with posted speed limit of 25 mph providing access between El Camino Real and North Fair Oaks. In the study vicinity, the roadway provides two motor vehicle travel lanes in each direction, on-street parking, continuous sidewalks on both sides, and no bicycle facilities.

Oakwood Boulevard is a north-south local street with posted speed limit of 25 mph providing access to residential neighborhoods and El Camino Real. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction and no pedestrian or bicycle facilities.

Oakwood Drive is an east-west local street with posted speed limit of 25 mph providing access between residential neighborhoods and El Camino Real. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction, on-street parking availability, and no pedestrian or bicycle facilities.

Selby Lane is an east-west local street with posted speed limit of 25 mph providing access to Selby Lane Elementary School, residential neighborhoods, and El Camino Real. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction, no sidewalks, and bicycle lanes between Oakwood Boulevard and El Camino Real.

Stockbridge Avenue is an east-west local street with posted speed limit of 25 mph providing access between residential neighborhoods and El Camino Real. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction and no pedestrian or bicycle facilities.

Waverly Avenue is a north-south local street with posted speed limit of 25 mph that runs from Markham Avenue to Fifth Avenue. In the study vicinity, the roadway provides one motor vehicle travel lane in each direction, on-street parking, continuous sidewalks on both sides, and no bicycle facilities.

Data Collection

Turning movement volumes were collected at the six study intersections on May 10, 2016. The collection was performed on a Tuesday while school was in session, representing typical weekday traffic. Vehicles, pedestrians, and bicycles were included in the volume counts during the a.m. peak period (7:00 a.m. – 9:00 a.m.), school p.m. peak period (1:15 p.m. – 3:15 p.m.), and p.m. peak period (4:00 p.m. – 6:00 p.m.). The following is the list of intersections included for analysis:

1. El Camino Real & Oakwood Drive-Dumbarton Avenue (Signal)
2. El Camino Real & Selby Lane (TWSC)
3. El Camino Real & Fifth Avenue (Signal)
4. El Camino Real & Stockbridge Avenue (OWSC)
5. Oakwood Boulevard & Selby Lane (OWSC)
6. Waverly Avenue & Fifth Avenue (Signal)

Additionally, average daily traffic (ADT) volumes were collected at the following four locations:

1. Selby Lane, west of El Camino Real
2. Selby Lane, east of El Camino Real
3. Fifth Avenue, east of El Camino Real
4. El Camino Real, between Selby Lane and Columbia Avenue

An origin-destination (O-D) survey was performed for three routes within the project vicinity as well. The O-D survey aids in understanding what impacts may arise to existing route choices with implementation of any alternative improvements in the system. All collected data is provided in **Appendix B**.

Existing Conditions Analysis

Level of Service Analysis Results

TJKM analyzed the six study intersections using a.m., school p.m., and p.m. peak hour turning movement volumes and signal timing sheets acquired from the Town and Caltrans. Peak hour volumes, traffic controls and lane geometries for the study intersections are illustrated in **Figure 2**, and bicycle and pedestrian volumes are illustrated in **Figure 3**. The analysis is based on the aforementioned LOS methodology found in HCM 2000 using Synchro 8.0 software.

Table 3 summarizes the Existing Conditions LOS analysis results for the six study intersections. Movement LOS tables and Synchro summary sheets are provided in **Appendix C** for Existing Conditions. Under this scenario, the following intersections operate at unacceptable LOS:

- El Camino Real & Oakwood Drive-Dumbarton Avenue during the a.m. peak hour
    - Westbound movement operates at LOS F
- El Camino Real & Selby Lane during the a.m. and school p.m. peak hour
- El Camino Real & Stockbridge Avenue during all peak hours
- Oakwood Boulevard & Selby Lane during the a.m. peak hour

Table 3: Existing Conditions Level of Service Analysis Results

ID	Intersection	Control Type	AM Peak Hour		School PM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS
1	El Camino Real & Oakwood Dr-Dumbarton Ave	Signal	33.7	C	12.5	B	18.8	B
2	El Camino Real & Selby Ln	TWSC	**>50***	**F**	**76.2**	**F**	19.2	C
3	El Camino Real & Fifth Ave	Signal	21.0	C	16.7	B	25.1	C
4	El Camino Real & Stockbridge Ave	OWSC	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
5	Oakwood Blvd & Selby Ln	OWSC	**33.4**	**D**	12.7	B	13.1	B
6	Waverly Ave & Fifth Ave	Signal	3.5	A	2.2	A	5.0	A

Notes: Delay = Average intersection delay in seconds per vehicle for signalized intersections or minor street (worst approach) delay for OWSC or TWSC intersections.
LOS = Level of Service
>50* = Control Delay at intersection exceeds software maximum reportable value, >50 seconds yields LOS F.
Bold indicates unacceptable operations.

The Existing Conditions analysis results show that all study intersections with Stop Control operate unacceptably during at least one peak hour. Stop Control intersections tend to have higher delays experienced by vehicles on the minor street. LOS and delay for OWSC or TWSC intersections is dependent on the critical movement at the location, typically minor street left-turn or thru movements. With large volumes on El Camino Real, it is difficult for minor street vehicles to find sufficient gap in the traffic stream to perform a left-turn or thru maneuver.

Existing Traffic Volumes, Lane Geometry and Controls

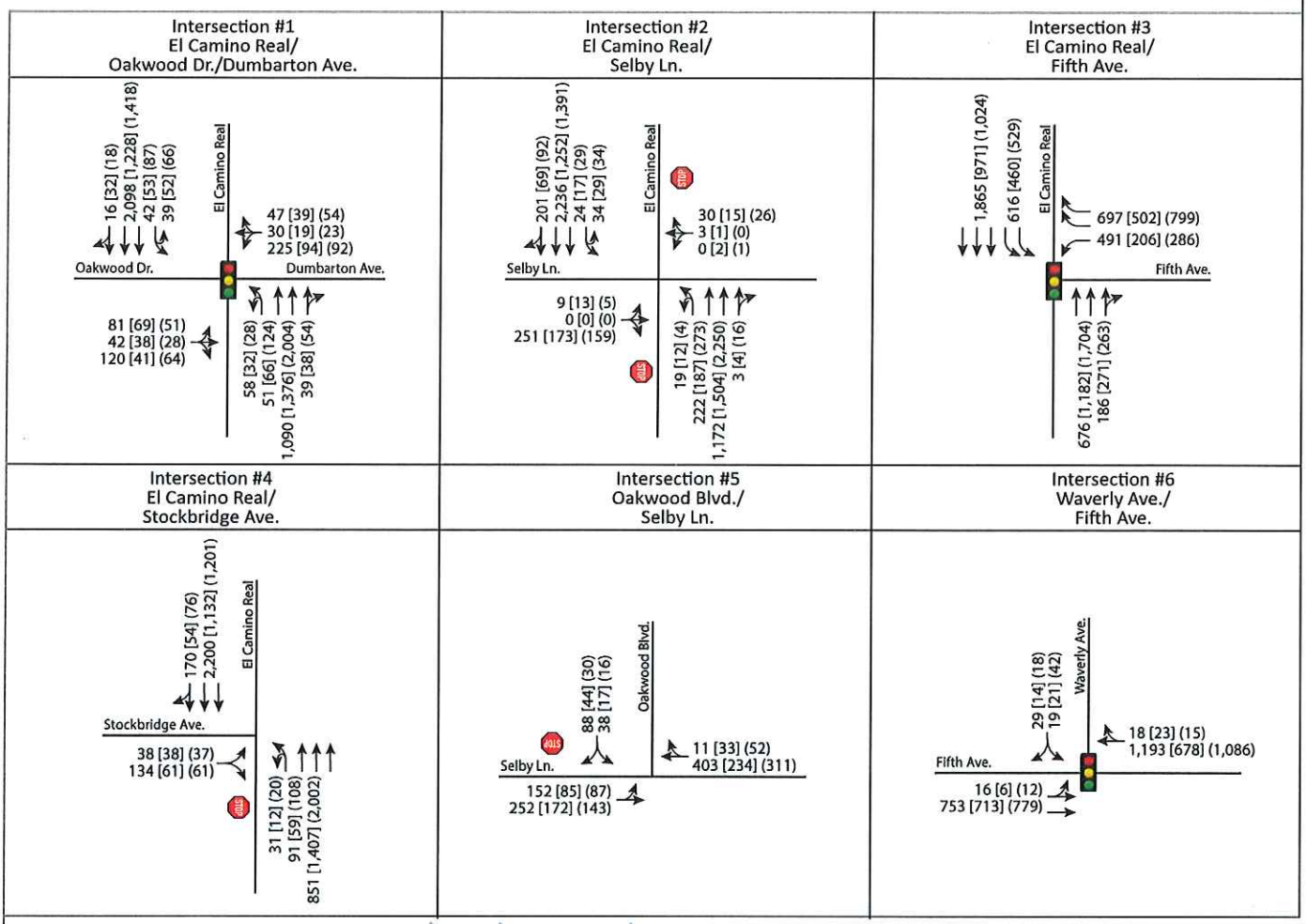

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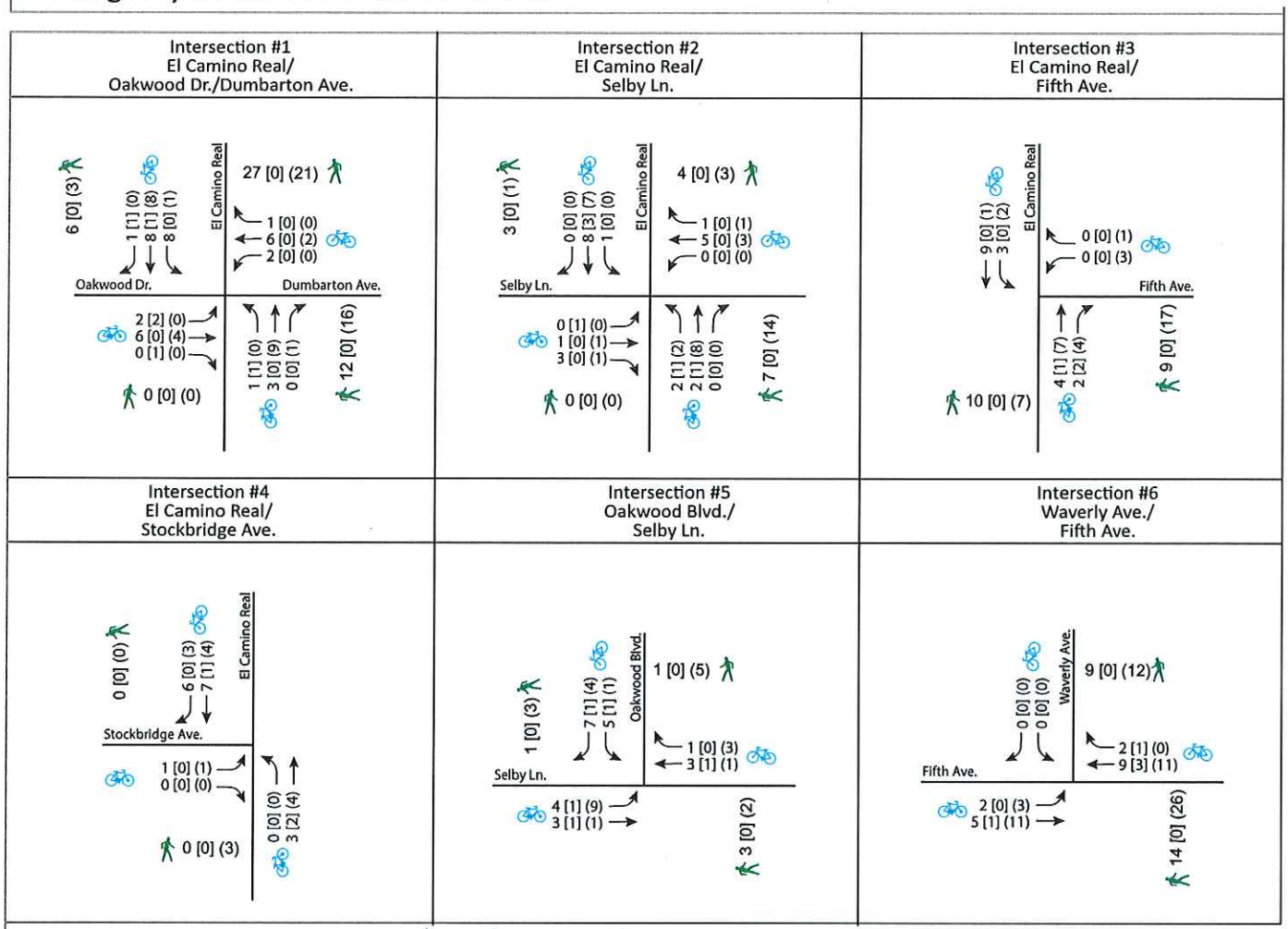
Figure 2

Existing Bicycle and Pedestrian Volumes



LEGEND

- Ⓧ Study Intersection
- XX AM Peak Hour Volumes
- [XX] School PM Peak Hour Volumes
- (XX) PM Peak Hour Volumes

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Figure 3

Queuing Analysis Results

Queuing analysis was also performed for the study intersections to understand adequacy of the existing turn pockets and provide basis for recommending storage lengths with each alternative. **Table 4** summarizes the Existing Conditions queues at turn pockets as determined through Synchro. The results presented below are based on 95th Percentile Queue Lengths (in feet), which is the highest queue length in the lane group. Queue summary reports generated from Synchro are provided in **Appendix C** for Existing Conditions. Under this scenario, the following pocket storage lengths are insufficient:

- Northbound left-turn at El Camino Real & Selby Lane during the a.m. and p.m. peak hours

The northbound left-turn pocket at this intersection is 55 feet, which is exceeded by the queues found during the a.m. and p.m. peak hours. Queues that exceed capacity have potential to spill over into the adjacent thru lanes, causing longer delays and back-ups. As noted in the table below, the following queues may be longer than calculated:

- Westbound left-turn at El Camino Real & Fifth Avenue during the a.m. peak hour
- Southbound left-turn at El Camino Real & Fifth Avenue during the a.m. and p.m. peak hours

The westbound left-turn is accommodated with a left turn trap lane that extends from El Camino Real to Waverly Avenue, which is over 600 feet in length. This distance would accommodate the possibly longer queue during the a.m. peak hour. The southbound left-turn queue is close to the storage capacity of 295 feet, and a longer queue could result in vehicles spilling into the adjacent southbound thru lane. This movement, however, provides two left-turn pockets and operates acceptably under Existing Conditions.

Table 4: Existing Conditions Turn-Pocket Queuing Summary

ID	Intersection	Peak Hour	EBL	WBL	WBR	NBL	SBL	SBR
1	El Camino Real & Oakwood Dr-Dumbarton Ave	AM	-	-	-	m99	80	-
		School PM	-	-	-	84	86	-
		PM	-	-	-	m129	131	-
2	El Camino Real & Selby Ln	AM	-	-	-	**193**	4	-
		School PM	-	-	-	45	3	-
		PM	-	-	-	**68**	7	-
3	El Camino Real & Fifth Ave	AM	-	#391	136	-	#272	-
		School PM	-	177	138	-	178	-
		PM	-	244	253	-	#274	-
4	El Camino Real & Stockbridge Ave	AM	-	-	-	51	-	-
		School PM	-	-	-	9	-	-
		PM	-	-	-	17	-	-
5	Oakwood Blvd & Selby Ln	AM	17	-	-	-	92	-
		School PM	8	-	-	-	12	-
		PM	7	-	-	-	11	-
6	Waverly Ave & Fifth Ave	AM	-	-	-	-	30	-
		School PM	-	-	-	-	28	-
		PM	-	-	-	-	42	-

Notes: **Bold** =95th percentile queue length exceeds provided storage capacity
m = Volume for 95th percentile queue is metered by upstream signal
# = Volume for 95th percentile queue exceeds capacity, queue may be longer
All measurements in feet

ALTERNATIVE EVALUATION

This section discusses the two alternative improvement options for the intersection of El Camino Real & Selby Lane. The alternatives are as follows:

- Alternative 1 Conditions (Existing Volumes)
  - Restrict left-turns/through movements from Selby Lane onto/across El Camino Real
  - Restrict southbound left-turns from El Camino Real onto Selby Lane
  - Install Rectangular Rapid Flashing Beacon (RRFB) for pedestrian crossing across El Camino Real

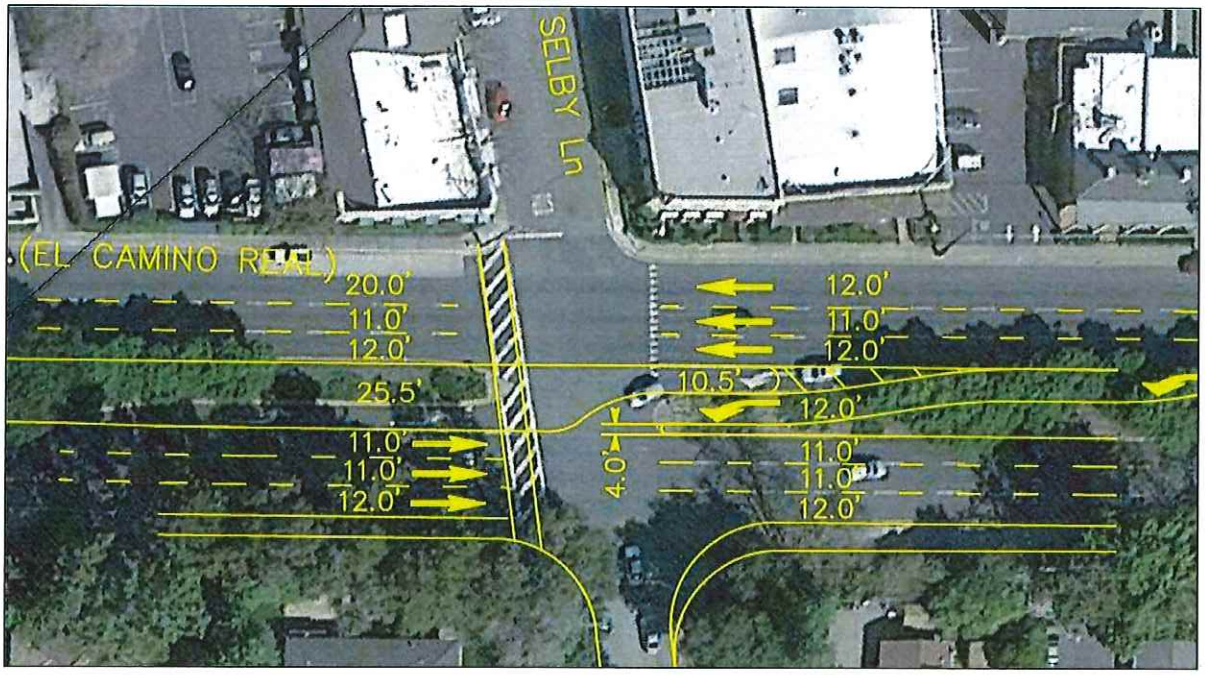


Image: Alternative 1 Design – Plan View

- Alternative 2 Conditions (Existing Volumes)
  - Install signal at intersection of El Camino Real & Selby Lane
  - Retain existing lane geometry

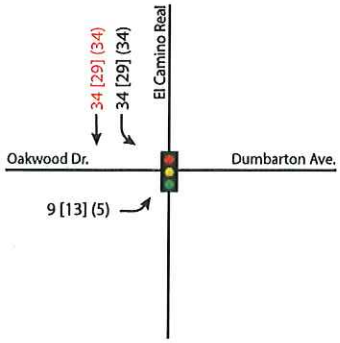
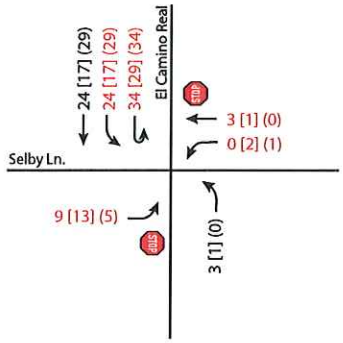
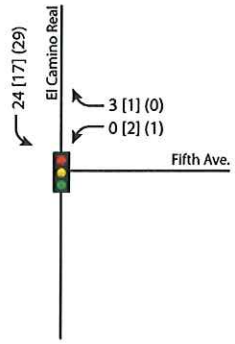
Alternative 1

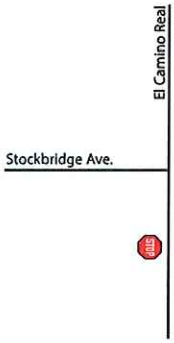
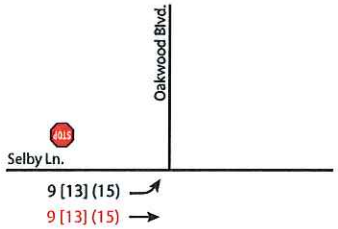
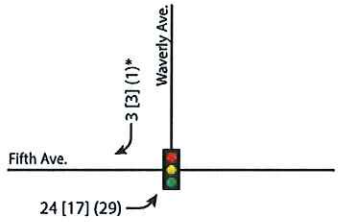
The existing traffic volumes under Alternative 1 Conditions were analyzed at the study intersections during the a.m., school p.m., and p.m. peak hours. The alternative restricts movements at the intersection of El Camino Real & Selby Lane, which requires assumptions for traffic rerouting. The alternative intersection configuration would prohibit southbound left- and U-turns, eastbound left- and thru-movements, and westbound left- and thru-movements. The assumptions under this scenario are as follows:

- Existing southbound U-turns moved to southbound left-turn at El Camino Real & Oakwood Drive-Dumbarton Avenue
- Existing southbound left-turns moved to southbound left-turn at El Camino Real & Fifth Avenue
    - Then added to eastbound left-turn at Waverly Avenue & Fifth Avenue
- Existing eastbound left-turns moved to eastbound left-turn at Oakwood Boulevard & Selby Lane
    - Then added to eastbound left-turn at El Camino Real & Oakwood Drive-Dumbarton Avenue
- Existing westbound left-turns and thru-movements moved to southbound right-turn at Waverly Avenue & Fifth Avenue
    - Left-turns added to westbound left-turn at El Camino Real & Fifth Avenue
    - Thru-movements added to westbound right-turn at El Camino Real & Fifth Avenue
        - Then added to northbound left-turn at El Camino Real & Selby Lane

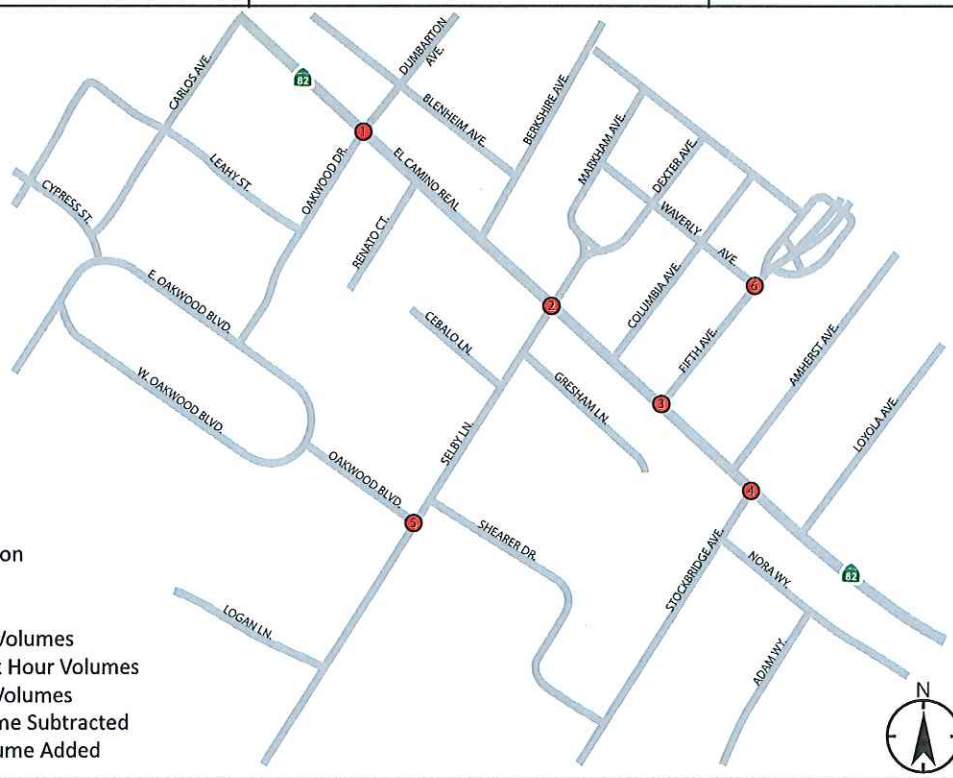
Figure 4 illustrates the rerouted traffic volumes using the above list of assumptions for Alternative 1, and **Figure 5** illustrates the adjusted Existing Conditions volumes under the Alternative 1 scenario.

Alternative 1 Traffic Rerouting

Intersection #1 El Camino Real/ Oakwood Dr./Dumbarton Ave.	Intersection #2 El Camino Real/ Selby Ln.	Intersection #3 El Camino Real/ Fifth Ave.
		

Intersection #4 El Camino Real/ Stockbridge Ave.	Intersection #5 Oakwood Blvd./ Selby Ln.	Intersection #6 Waverly Ave./ Fifth Ave.
		

Note: * Volumes equal to the sum of removed volumes from east leg of Intersection #2



LEGEND

- Study Intersection
- Traffic Signal
- STOP Stop Sign
- XX AM Peak Hour Volumes
- [XX] School PM Peak Hour Volumes
- (XX) PM Peak Hour Volumes

Note: Red = Volume Subtracted
Black = Volume Added

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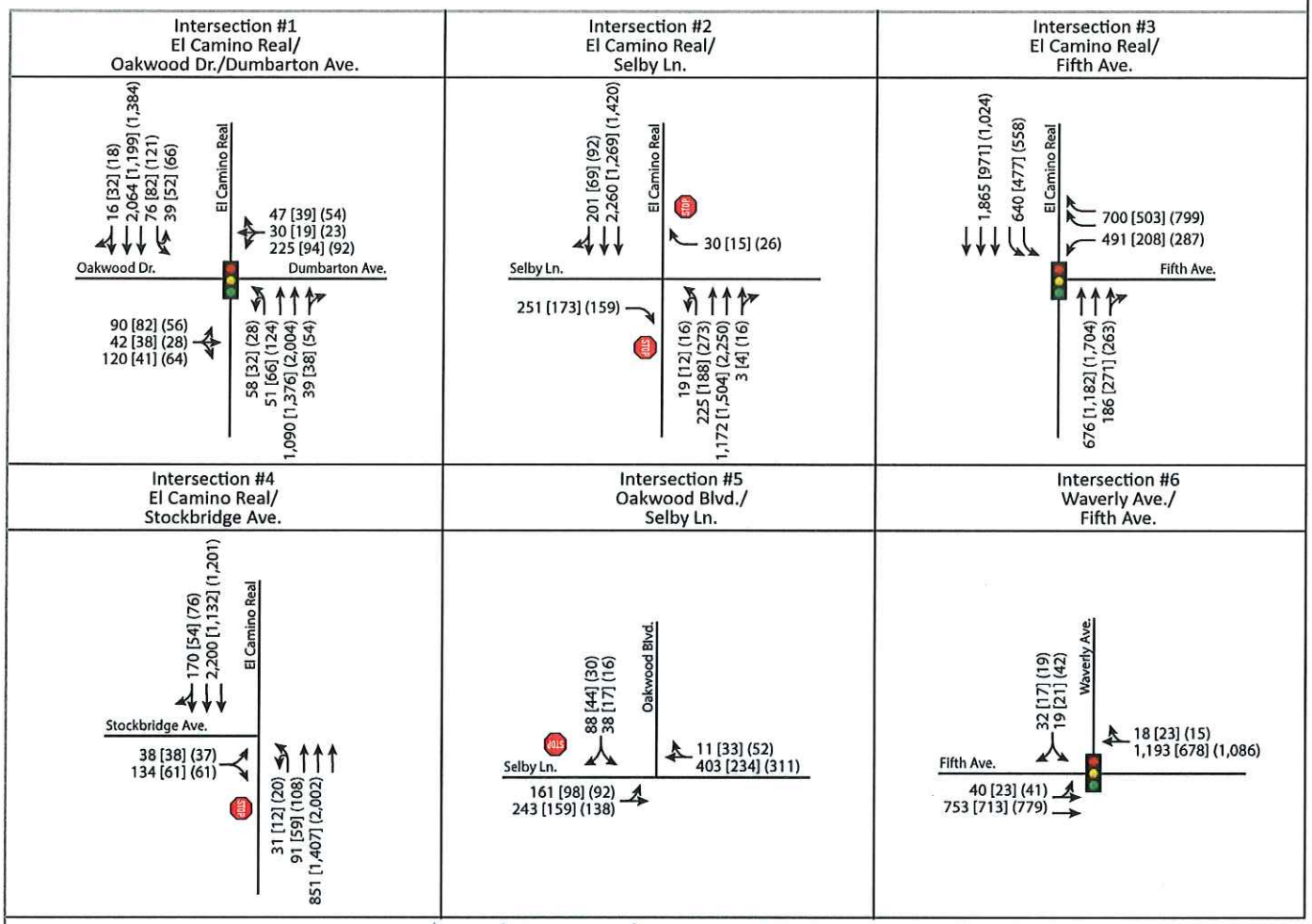
Figure 4

Alternative 1 Traffic Volumes, Lane Geometry and Controls



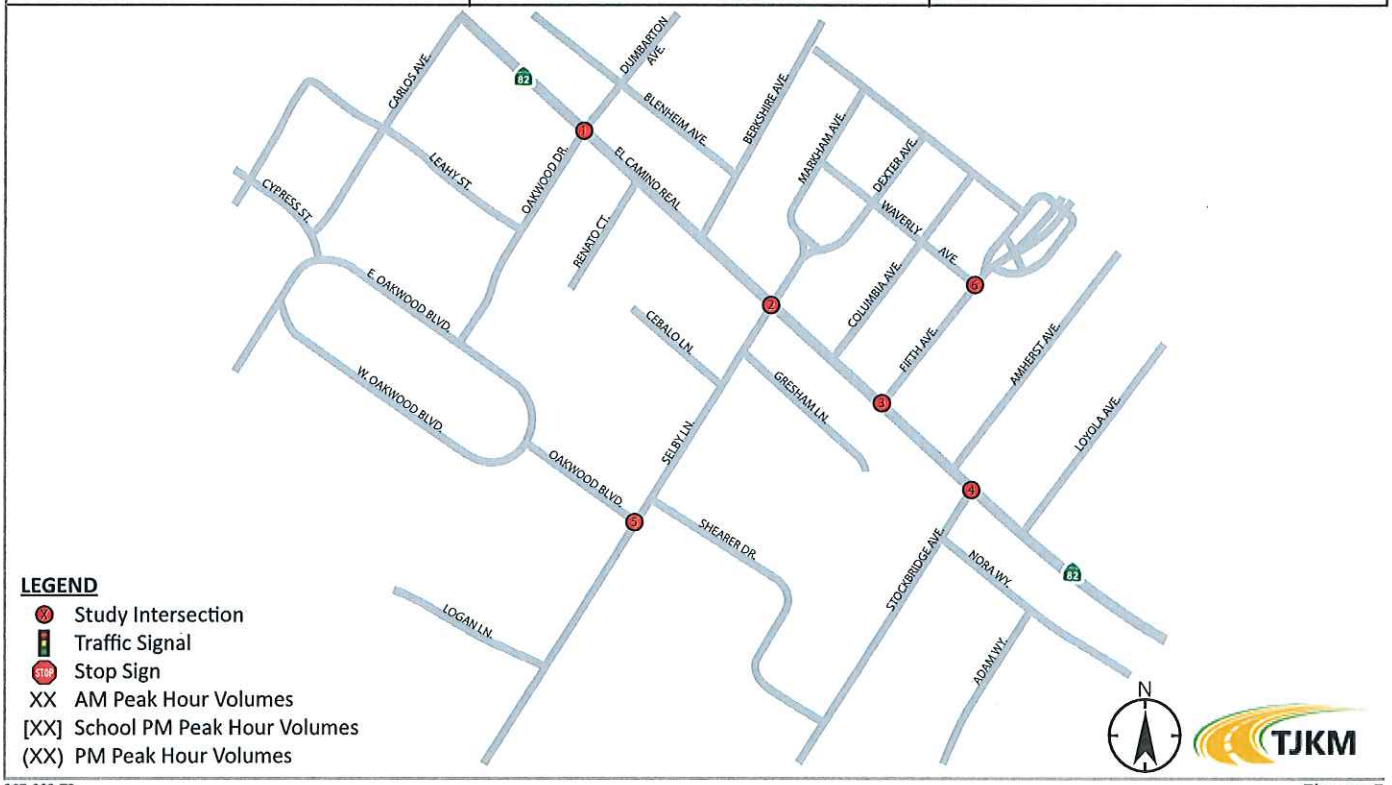


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Figure 5

Level of Service Analysis Results

Using the above assumptions, existing traffic volumes were rerouted through the study intersections. Alternative 1 peak-hour volumes are illustrated in **Figure 5**. **Table 5** summarizes the Alternative 1 LOS analysis results for the six study intersections. As shown in the table, the intersection of El Camino Real & Selby Lane experiences the greatest benefit of the alternative intersection configuration. The delay is reduced during the a.m., school p.m., and p.m. peak hours and LOS is improved to acceptable level during the school p.m. peak hour. Movement LOS tables and Synchro summary sheets are provided in **Appendix D** for Alternative 1.

Under this scenario, the following intersections show operational improvements from Existing Conditions:

- El Camino Real & Selby Lane
  - School p.m. peak hour LOS improves from LOS F to LOS B

The following intersections operate at unacceptable LOS under Alternative 1 Conditions:

- El Camino Real & Oakwood Drive-Dumbarton Avenue during the a.m. peak hour
  - Westbound movement operates at LOS F (as under Existing Conditions)
- El Camino Real & Selby Lane during the a.m. peak hour
- El Camino Real & Stockbridge Avenue during all peak hours (as under Existing Conditions)
- Oakwood Boulevard & Selby Lane during the a.m. peak hour (as under Existing Conditions)

No intersection operations are projected to degrade significantly from Existing Conditions, and the alternative intersection configuration yields substantial improvement at El Camino Real & Selby Lane during the school p.m. peak hour. This improvement is attributed to the removal of critical minor street movements and resulting traffic diversion.

Table 5: Alternative 1 Conditions Level of Service Analysis Results

ID	Intersection	Control Type	Scenario	AM Peak Hour		School PM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	El Camino Real & Oakwood Dr-Dumbarton Ave	Signal	Existing	33.7	C	12.5	B	18.8	B
			Alternative 1	32.3	C	13.5	B	21.5	C
2	El Camino Real & Selby Ln	TWSC	Existing	**>50***	**F**	**76.2**	**F**	19.2	C
			Alternative 1	**68.9**	**F**	14.8	B	18.4	C
3	El Camino Real & Fifth Ave	Signal	Existing	21.0	C	16.7	B	25.1	C
			Alternative 1	21.5	C	17.1	B	26.1	C
4	El Camino Real & Stockbridge Ave	OWSC	Existing	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
			Alternative 1	**>50***	**F**	**76.0**	**F**	**250.6**	**F**
5	Oakwood Blvd & Selby Ln	OWSC	Existing	**33.4**	**D**	12.7	B	13.1	B
			Alternative 1	**34.5**	**D**	12.8	B	13.1	B
6	Waverly Ave & Fifth Ave	Signal	Existing	3.5	A	2.2	A	5.0	A
			Alternative 1	3.6	A	2.7	A	5.1	A

Notes: Delay = Average intersection delay in seconds per vehicle for signalized intersections or minor street (worst approach) delay for OWSC or TWSC intersections.
LOS = Level of Service
>50* = Control Delay at intersection exceeds software maximum reportable value, >50 seconds yields LOS F.
Bold indicates unacceptable operations.

Queuing Analysis Results

Table 6 summarizes the Alternative 1 Conditions queues at turn pockets as determined through Synchro. The results presented below are based on 95th Percentile Queue Lengths (in feet), which is the highest queue length in the lane group. Queue summary reports generated from Synchro are provided in **Appendix D** for Alternative 1 Conditions. The following pocket storage lengths are insufficient:

- Northbound left-turn at El Camino Real & Selby Lane during the a.m. and p.m. peak hours
- Southbound left-turn at El Camino Real & Fifth Avenue during the p.m. peak hour

The northbound left-turn pocket at El Camino Real & Selby Lane is 55 feet, which is exceeded by the queues projected during the a.m. and p.m. peak hours under Alternative 1. The southbound left-turn pocket at El Camino Real & Fifth Avenue is 295 feet, which is exceeded by the queue projected during the p.m. peak hour. Queues that exceed capacity have potential to spill over into the adjacent thru lanes, causing longer delays and back-ups. The following queues may be longer than calculated:

- Westbound left-turn at El Camino Real & Fifth Avenue during the a.m. peak hour
- Southbound left-turn at El Camino Real & Fifth Avenue during the a.m. and p.m. peak hours

The westbound left-turn at El Camino Real & Fifth Avenue is accommodated with a left-turn trap lane that extends from El Camino Real to Waverly Avenue, which is over 600 feet in length. This distance would accommodate the possibly longer queue during the a.m. peak hour. The southbound left-turn queue is at storage capacity for the movement, and a longer queue could result in vehicles spilling into the adjacent southbound thru lanes. The two left-turn pockets provided operate acceptably under Alternative 1 Conditions. The increase in queue lengths due to Alternative 1 is equivalent to approximately one vehicle.

Table 6: Alternative 1 Conditions Turn-Pocket Queuing Summary

ID	Intersection	Peak Hour	EBL	EBR	WBL	WBR	NBL	SBL	SBR
1	El Camino Real & Oakwood Dr-Dumbarton Ave	AM	-	-	-	-	100	102	-
		School PM	-	-	-	-	86	104	-
		PM	-	-	-	-	133	155	-
2	El Camino Real & Selby Ln	AM	-	55	-	5	**214**	-	-
		School PM	-	20	-	2	45	-	-
		PM	-	21	-	3	**73**	-	-
3	El Camino Real & Fifth Ave	AM	-	-	#391	137	-	#288	-
		School PM	-	-	178	138	-	185	-
		PM	-	-	245	253	-	**#296**	-
4	El Camino Real & Stockbridge Ave	AM	-	-	-	-	52	-	-
		School PM	-	-	-	-	9	-	-
		PM	-	-	-	-	17	-	-
5	Oakwood Blvd & Selby Ln	AM	18	-	-	-	-	94	-
		School PM	10	-	-	-	-	12	-
		PM	7	-	-	-	-	11	-
6	Waverly Ave & Fifth Ave	AM	-	-	-	-	-	31	-
		School PM	-	-	-	-	-	29	-
		PM	-	-	-	-	-	42	-

Notes: **Bold** =95th percentile queue length exceeds provided storage capacity
= Volume for 95th percentile queue exceeds capacity, queue may be longer
All measurements in feet

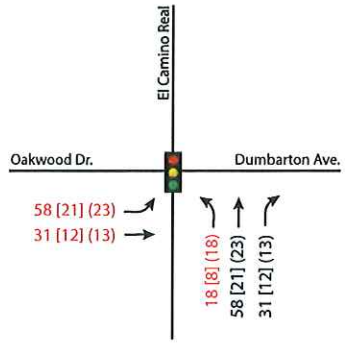
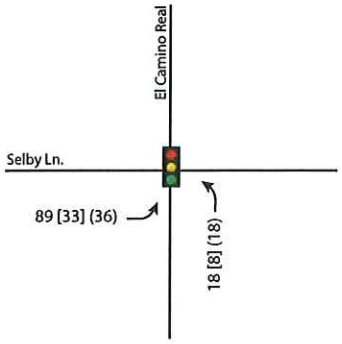
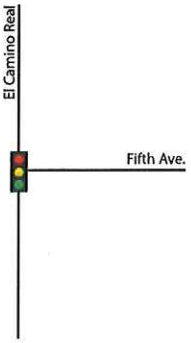
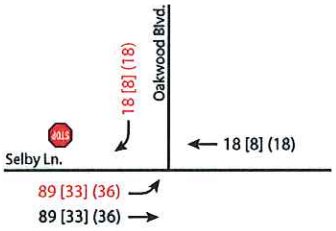
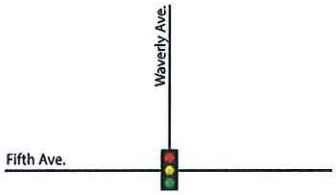
Alternative 2

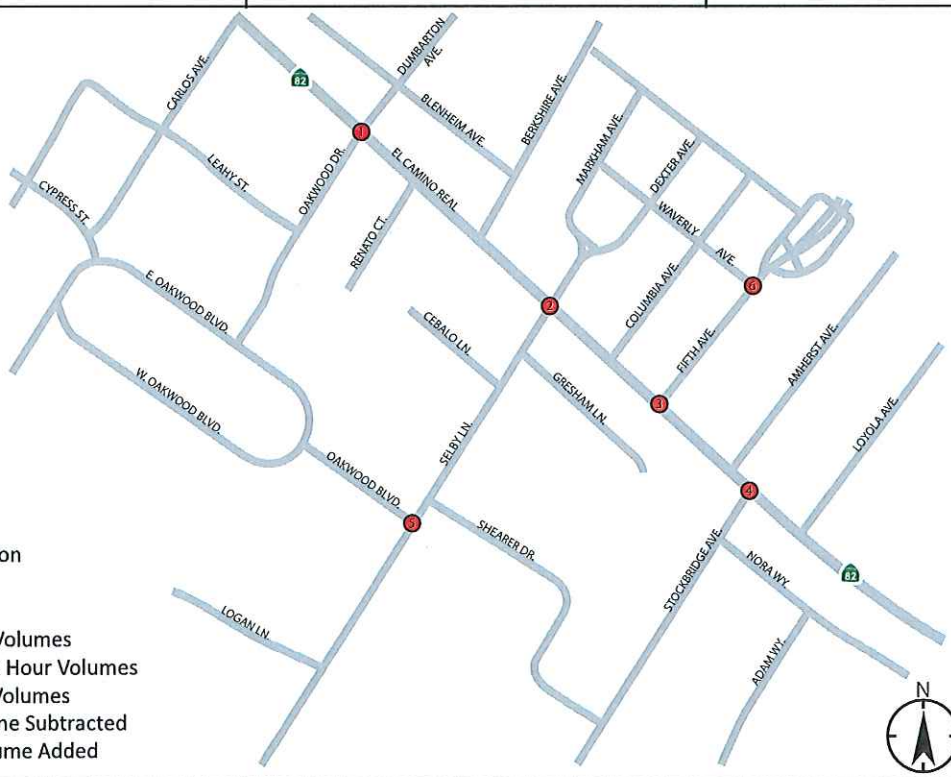
The existing traffic volumes under Alternative 2 Conditions were analyzed at the study intersections during the a.m., school p.m., and p.m. peak hours. The alternative involves installing a signal at the intersection of El Camino Real & Selby Lane, which requires traffic rerouting and signal timing assumptions. The alternative intersection control would improve minor street operations and cause traffic diversion. Alternative 2 peak hour volumes are illustrated in **Figure 5**. The assumptions under this scenario are as follows:

- Northbound left-turns at El Camino Real & Oakwood Drive-Dumbarton Avenue moved to northbound left-turn at El Camino Real & Selby Lane
    - Volume removed from southbound right-turn at Oakwood Boulevard & Selby Lane
- Eastbound left-turns at Oakwood Boulevard & Selby Lane moved to eastbound left-turn at El Camino Real & Selby Lane
    - Existing eastbound approach at El Camino Real & Oakwood Drive-Dumbarton Avenue is 65% left-turns and 35% thru-movements
        - 65% moved to northbound thru-movement at El Camino Real & Oakwood Drive-Dumbarton Avenue
        - 35% moved to northbound right-turn at El Camino Real & Oakwood Drive-Dumbarton Avenue
- El Camino Real & Selby Lane Intersection
    - Option 1
        - Permissive phasing for Selby Lane movements
    - Option 2
        - Split phasing for Selby Lane movements
        - Eastbound approach geometry modified to provide Shared Thru-Left Pocket and Exclusive Right-Turn Lane

Figure 6 illustrates the rerouted traffic volumes using the above list of assumptions for Alternative 2, and **Figure 7** illustrates the adjusted Existing Conditions volumes under the Alternative 2 scenario.

Alternative 2 Traffic Rerouting

Intersection #1 El Camino Real/ Oakwood Dr./Dumbarton Ave.	Intersection #2 El Camino Real/ Selby Ln.	Intersection #3 El Camino Real/ Fifth Ave.
		
Intersection #4 El Camino Real/ Stockbridge Ave.	**Intersection #5 Oakwood Blvd./ Selby Ln.**	**Intersection #6 Waverly Ave./ Fifth Ave.**
		



LEGEND

- Study Intersection
- Traffic Signal
- Stop Sign
- XX AM Peak Hour Volumes
- [XX] School PM Peak Hour Volumes
- (XX) PM Peak Hour Volumes

Note: Red = Volume Subtracted
Black = Volume Added

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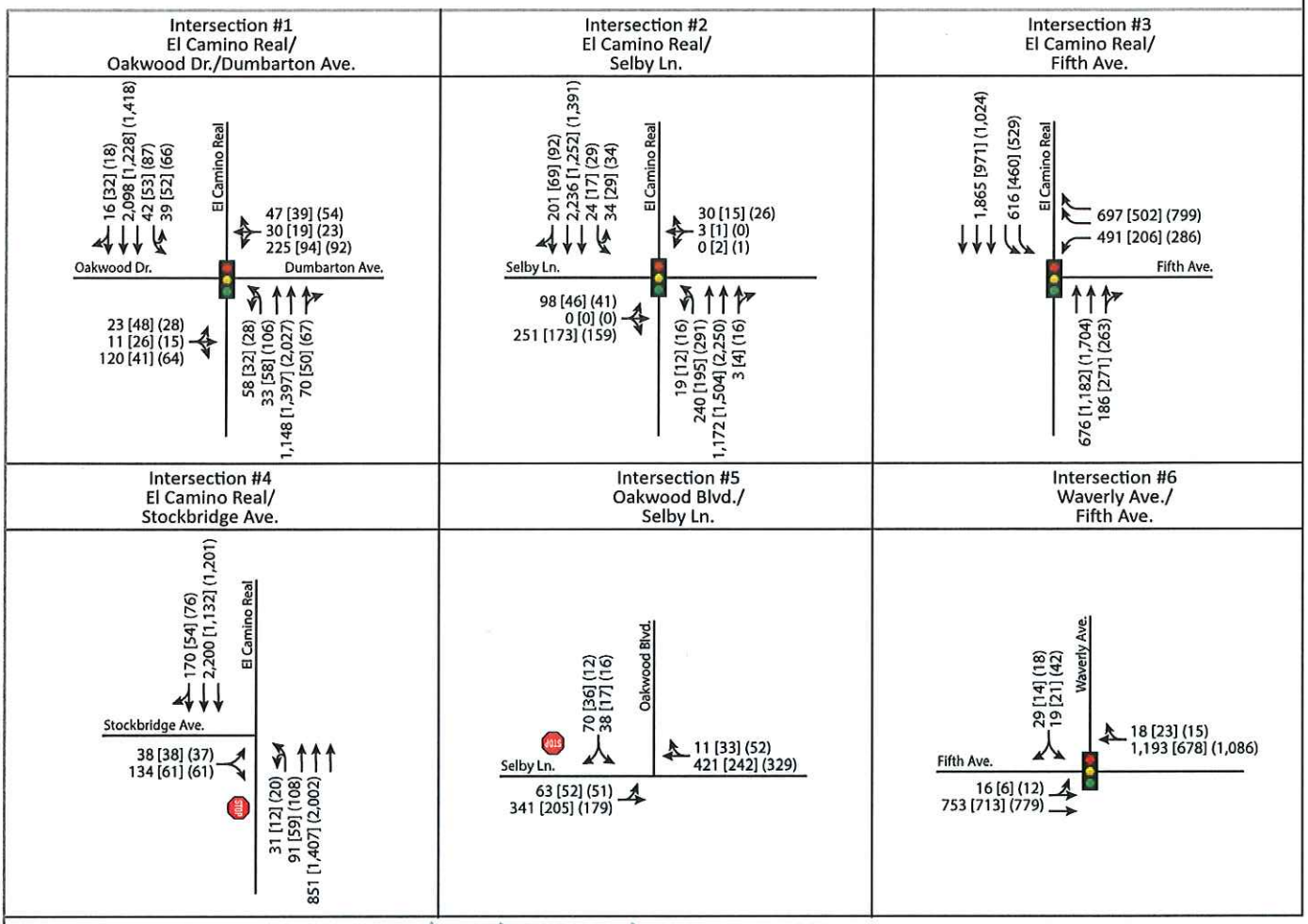
Figure 6

Alternative 2 Traffic Volumes, Lane Geometry and Controls



LEGEND

- Study Intersection
- Traffic Signal
- Stop Sign
- XX AM Peak Hour Volumes
- [XX] School PM Peak Hour Volumes
- (XX) PM Peak Hour Volumes

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Figure 7

Option 1 Level of Service Analysis Results

Using the above assumptions, existing traffic volumes were rerouted through the study intersections. **Table 7** summarizes Alternative 2, Option 1 LOS analysis results for the study intersections. Movement LOS tables and Synchro summary sheets for Alternative 2, Option 1 are in **Appendix E**.

Under this scenario, the following intersections show operational improvements from Existing Conditions:

- El Camino Real & Selby Lane
  - A.M. peak hour LOS improves from LOS F to LOS E (still unacceptable per standards)
  - School p.m. peak hour LOS improves from LOS F to LOS B
- Oakwood Boulevard & Selby Lane
  - A.M. peak hour delay reduces from 33.4 to 26.1 seconds (still unacceptable per standards)

The following intersections operate at unacceptable LOS under Alternative 2, Option 1 Conditions:

- El Camino Real & Oakwood Drive-Dumbarton Avenue during the a.m. peak hour
  - Westbound movement operates at LOS E (improved from Existing Conditions)
- El Camino Real & Selby Lane during the a.m. peak hour
- El Camino Real & Stockbridge Avenue during all peak hours (as under Existing Conditions)
- Oakwood Boulevard & Selby Lane during the a.m. peak hour (as under Existing Conditions)

Intersections not in compliance with the LOS standard under Existing Conditions shall not operate at LOS D or worse and experience an increase in average control delay of four or more seconds. The intersections operating acceptably under Existing Conditions are not projected to worsen due to the project.

Table 7: Alternative 2, Option 1 Level of Service Analysis Results

ID	Intersection	Control Type	Scenario	AM Peak Hour		School PM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	El Camino Real & Oakwood Dr-Dumbarton Ave	Signal	Existing	33.7	C	12.5	B	18.8	B
			Option 1	28.7	C	12.0	B	18.7	B
2	El Camino Real & Selby Ln	TWSC	Existing	**>50***	**F**	**76.2**	**F**	19.2	C
		Signal	Option 1	**55.4**	**E**	17.3	B	21.1	C
3	El Camino Real & Fifth Ave	Signal	Existing	21.0	C	16.7	B	25.1	C
			Option 1	21.0	C	16.7	B	25.1	C
4	El Camino Real & Stockbridge Ave	OWSC	Existing	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
			Option 1	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
5	Oakwood Blvd & Selby Ln	OWSC	Existing	**33.4**	**D**	12.7	B	13.1	B
			Option 1	**26.1**	**D**	12.5	B	13.5	B
6	Waverly Ave & Fifth Ave	Signal	Existing	3.5	A	2.2	A	5.0	A
			Option 1	3.5	A	2.2	A	5.0	A

Notes: Delay = Average intersection delay in seconds per vehicle for signalized intersections or minor street (worst approach) delay for OWSC or TWSC intersections.
LOS = Level of Service
>50* = Control Delay at intersection exceeds software maximum reportable value, >50 seconds yields LOS F.
Bold indicates unacceptable operations.

Option 1 Queuing Analysis Results

Table 8 summarizes the Alternative 2, Option 1 queues at turn pockets as determined through Synchro. The results presented below are based on 95th Percentile Queue Lengths (in feet), which is the highest queue length in the lane group. Queue summary reports generated from Synchro are provided in **Appendix E** for Alternative 2, Option 1. The following pocket storage lengths are insufficient:

- Northbound left-turn at El Camino Real & Selby Lane during all peak hours
- Southbound left-turn at El Camino Real & Selby Lane during the a.m. and p.m. peak hours

The northbound left-turn pocket at El Camino Real & Selby Lane is 55 feet, which is exceeded by the queues projected during the a.m. and p.m. peak hours under Alternative 2, Option 1. The southbound left-turn pocket at El Camino Real & Selby Lane is 105 feet, which is exceeded by the queue projected during the a.m. peak hour. Queues that exceed capacity have potential to spill over into the adjacent thru lanes, causing longer delays and back-ups. The following queues may be longer than calculated:

- Northbound left-turn at El Camino Real & Selby Lane during the a.m. and p.m. peak hours
- Westbound left-turn at El Camino Real & Fifth Avenue during the a.m. peak hour
- Southbound left-turn at El Camino Real & Fifth Avenue during the a.m. and p.m. peak hours

The westbound left-turn at El Camino Real & Fifth Avenue is accommodated with a left-turn trap lane that extends from El Camino Real to Waverly Avenue, which is over 600 feet in length. This distance would accommodate the possibly longer queue during the a.m. peak hour. The southbound left-turn queue is close to the storage capacity of 295 feet, and a longer queue could result in vehicles spilling into the adjacent southbound thru lane. Queue increases may be accommodated with turn-pocket extensions.

Table 8: Alternative 2, Option 1 Turn-Pocket Queuing Summary

ID	Intersection	Peak Hour	EBL	WBL	WBR	NBL	SBL	SBR
1	El Camino Real & Oakwood Dr-Dumbarton Ave	AM	-	-	-	86	79	-
		School PM	-	-	-	79	85	-
		PM	-	-	-	118	131	-
2	El Camino Real & Selby Ln	AM	-	-	-	**#445**	**111**	-
		School PM	-	-	-	**288**	87	-
		PM	-	-	-	**#516**	**122**	-
3	El Camino Real & Fifth Ave	AM	-	#391	136	-	#272	-
		School PM	-	177	138	-	178	-
		PM	-	244	253	-	#274	-
4	El Camino Real & Stockbridge Ave	AM	-	-	-	51	-	-
		School PM	-	-	-	9	-	-
		PM	-	-	-	17	-	-
5	Oakwood Blvd & Selby Ln	AM	6	-	-	-	63	-
		School PM	5	-	-	-	10	-
		PM	4	-	-	-	7	-
6	Waverly Ave & Fifth Ave	AM	-	-	-	-	30	-
		School PM	-	-	-	-	28	-
		PM	-	-	-	-	42	-

Notes: **Bold** =95th percentile queue length exceeds provided storage capacity
= Volume for 95th percentile queue exceeds capacity, queue may be longer
All measurements in feet

Option 2 Level of Service Analysis Results

With signalization of the El Camino Real & Selby Lane intersection, split phasing is analyzed in the traffic model as Alternative 2, Option 2. Using the assumptions in the beginning of this chapter, existing traffic volumes were rerouted through the study intersections. **Table 9** summarizes Alternative 2, Option 2 LOS analysis results for the six study intersections compared to Alternative 2, Option 1. Movement LOS tables and Synchro summary sheets are provided in **Appendix F** for Alternative 2, Option 2.

As for Alternative 1 and Alternative 2, Option 1, El Camino Real & Selby Lane improves operations with Alternative 2, Option 2 during the a.m. and school p.m. peak hours. Option 2, however, improves a.m. peak hour operations to LOS D, which is near acceptable per the LOS standards. Compared with Alternative 1 and Alternative 2, Option 1, this alternative shows improvement to intersection operations during the a.m. peak hour, which is a substantial improvement from Existing Conditions.

Under this scenario, all study intersections except El Camino Real & Stockbridge Avenue operate at LOS D or better during all peak hours. From Existing Conditions, intersections not in compliance with the LOS standard shall not operate at LOS D or worse and experience an increase in average control delay of four or more seconds, therefore no intersection is negatively impacted as a result of the project. The intersections operating acceptably under Existing Conditions shall not operate at LOS D or worse.

Table 9: Alternative 2, Option 2 Level of Service Analysis Results

ID	Intersection	Control Type	Scenario	AM Peak Hour		School PM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	El Camino Real & Oakwood Dr-Dumbarton Ave	Signal	Option 1	28.7	C	12.0	B	18.7	B
			Option 2	28.7	C	12.0	B	18.7	B
2	El Camino Real & Selby Ln	Signal	Option 1	**55.4**	**E**	17.3	B	21.1	C
			Option 2	**41.2**	**D**	17.9	B	22.8	C
3	El Camino Real & Fifth Ave	Signal	Option 1	21.0	C	16.7	B	25.1	C
			Option 2	21.0	C	16.7	B	25.1	C
4	El Camino Real & Stockbridge Ave	OWSC	Option 1	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
			Option 2	**>50***	**F**	**75.8**	**F**	**249.6**	**F**
5	Oakwood Blvd & Selby Ln	OWSC	Option 1	**26.1**	**D**	12.5	B	13.5	B
			Option 2	**26.1**	**D**	12.5	B	13.5	B
6	Waverly Ave & Fifth Ave	Signal	Option 1	3.5	A	2.2	A	5.0	A
			Option 2	3.5	A	2.2	A	5.0	A

Notes: Delay = Average intersection delay in seconds per vehicle for signalized intersections or minor street (worst approach) delay for OWSC or TWSC intersections.
LOS = Level of Service
>50* = Control Delay at intersection exceeds software maximum reportable value, >50 seconds yields LOS F.
Bold indicates unacceptable operations.

Option 2 Queuing Analysis Results

Table 10 summarizes the queues projected at the turn pockets for Alternative 2, Option 2. Queue summary reports generated from Synchro are provided in **Appendix F** for Alternative 2, Option 2. Under this scenario, the northbound and southbound left-turn pockets at El Camino Real & Selby Lane are projected to be insufficient in storage length. The projected queue for the northbound left-turn exceeds storage capacity during all peak hours and during the a.m. and p.m. peak hours for the southbound movement. These queues have potential to spill back into the adjacent northbound or southbound through lanes on El Camino Real and cause increased delay and back-ups.

Table 10: Alternative 2, Option 2 Turn-Pocket Queuing Summary

ID	Intersection	Peak Hour	EBL	EBR	WBL	WBR	NBL	SBL	SBR
1	El Camino Real & Oakwood Dr-Dumbarton Ave	AM	-	-	-	-	86	79	-
		School PM	-	-	-	-	79	85	-
		PM	-	-	-	-	118	131	-
2	El Camino Real & Selby Ln	AM	146	72	-	-	**#491**	**110**	-
		School PM	80	59	-	-	**#268**	78	-
		PM	68	39	-	-	**#560**	**120**	-
3	El Camino Real & Fifth Ave	AM	-	-	#391	136	-	#272	-
		School PM	-	-	177	138	-	178	-
		PM	-	-	244	253	-	#274	-
4	El Camino Real & Stockbridge Ave	AM	-	-	-	-	51	-	-
		School PM	-	-	-	-	9	-	-
		PM	-	-	-	-	17	-	-
5	Oakwood Blvd & Selby Ln	AM	6	-	-	-	-	63	-
		School PM	5	-	-	-	-	10	-
		PM	4	-	-	-	-	7	-
6	Waverly Ave & Fifth Ave	AM	-	-	-	-	-	30	-
		School PM	-	-	-	-	-	28	-
		PM	-	-	-	-	-	42	-

Notes: **Bold** =95th percentile queue length exceeds provided storage capacity
= Volume for 95th percentile queue exceeds capacity, queue may be longer
All measurements in feet

Alternative Comparison

This section discusses the pros and cons of each alternative. For all alternative improvements, southbound queues at El Camino Real & Fifth Avenue and northbound and southbound queues at El Camino Real & Selby Lane would benefit from increased turn-pocket storage capacity.

Alternative Pros

Alternative 1

Compared with Existing Conditions, Alternative 1 attributes the following improvements to traffic operations:

- Reduced delay at El Camino Real & Selby Lane during the a.m. and school p.m. peak hours
    - Operational improvement for eastbound and westbound movements
- El Camino Real & Selby Lane improved to acceptable LOS during the school p.m. peak hour
- Improved pedestrian safety with installation of RRFB
    - Heightened awareness of pedestrian presence
    - Improved pedestrian visibility
- No negative impacts to surrounding intersection LOS and delay
- No negative impacts to intersection movement LOS and delay

Alternative 2

Compared with Existing Conditions, Alternative 2 attributes the following improvements to traffic operations:

- Reduced delay and improved LOS at El Camino Real & Selby Lane during the a.m. and school p.m. peak hours
- El Camino Real & Selby Lane improved to acceptable LOS during the school p.m. peak hour
- Improved access for Selby Lane and surrounding neighborhood residents
- Improved pedestrian safety with dedicated pedestrian crossing phases
- Improved vehicle safety with dedicated green time for minor street movements
- No negative impacts to existing vehicle access
- No negative impacts to surrounding intersection LOS and delay
- No negative impacts to intersection movement LOS and delay

Option 1

- El Camino Real & Selby Lane operation improved to LOS E during the a.m. peak hour

Option 2

- El Camino Real & Selby Lane operation improved to near acceptable (LOS D) operations during the a.m. peak hour

Alternative Cons

Alternative 1

Most negative aspects of Alternative 1 are associated with projected queues and the physical constraint of prohibiting movements. The following queues are projected to increase as a result of Alternative 1:

- Northbound left-turn at El Camino Real & Selby Lane during the a.m. and p.m. peak hours
- Southbound left-turn at El Camino Real & Fifth Avenue during all peak hours

The proposed movement restrictions would cause traffic diversion through the surrounding residential neighborhoods. This would result in up to approximately 15 vehicles travelling on Oakwood Boulevard and Oakwood Drive instead of Selby Lane during a peak hour. Additionally, Alternative 1 restricts access for Selby Lane and surrounding neighborhood residents. Residents on the east side of El Camino Real will only have right-in/right-out operations at El Camino Real & Selby Lane, forcing westbound left-turns and thru movements to the intersection of El Camino Real & Fifth Avenue. Residents on the west side of El Camino Real will experience similar restrictions, and will use El Camino Real & Oakwood Drive-Dumbarton Avenue to travel northbound.

Alternative 2

Alternative 2 is projected to cause the following queues to increase:

- Northbound left-turn at El Camino Real & Selby Lane during all peak hours
- Southbound left-turn at El Camino Real & Selby Lane during the a.m. peak hour

Additionally, either option for Alternative 2 will create more vehicle traffic on Selby Lane between Oakwood Boulevard and El Camino Real. The installation of a signal at the intersection will improve operations, allowing minor street vehicles to join El Camino Real traffic effectively. This provision will appeal to drivers who currently avoid the El Camino Real & Selby Lane intersection due to excessive delays. Approximately 90 vehicles are projected to divert from Oakwood Boulevard and Oakwood Drive onto Selby Lane during the a.m. peak hour as a result of Alternative 2.

<u>Option 1</u>

- Extensive queues projected for northbound left-turn at El Camino Real & Selby Lane
    - May be mitigated through signal coordination along El Camino Real and extended turn pocket

<u>Option 2</u>

- Lane geometry adjustment would require redesign of eastbound Selby Lane approach
- Extensive queues projected for northbound left-turn at El Camino Real & Selby Lane
    - May be mitigated through signal coordination along El Camino Real and extended turn pocket