VICE

Traffic Impact Study
1455 Freedom Blvd
APN 016-061-06

Prepared For:

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Selma, CA 93662

Prepared by:

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Date:
April 1, 2021

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1.0 Summary

Vang Inc. Consulting Engineers prepared the Transportation Impact Study for the Gas Station and Carwash development located at 1455 Freedom Blvd to examine the impacts of the development on the surrounding transportation network. The development is located on a 0.527-acre parcel located at 1455 Freedom Blvd in Watsonville, California. The project site is zoned Neighborhood Shopping Center (CNS), with a General Plan Land Use Designation of General Commercial. The site is bordered by Alta Vista Avenue to the north, Freedom Blvd to the east, and existing commercial chopping center to south and west. The project consists of an existing convenience market and gas station with eight vehicle-fueling positions. The Developer proposes to construct an automated/self serve car wash with one tunnel.

The City of Watsonville has identified the following intersections for Level of Service and Queuing analysis:

1. Freedom Blvd/Alta Vista Avenue
2. Existing driveway on Atla Vista Avenue
3. Existing driveway on Freedom Blvd

The intersection Level of Service (LOS) analysis will be performed for the above intersections, based on the 2010 Highway Capacity Manual (HCM). The scenarios to be evaluated based on Caltrans TIS Guidelines.

A. Existing
B. Existing Plus Project

Traffic counts were conducted on Wednesday, December 9, 2020 (for detailed traffic count data refer to Appendix A). Traffic Counts were collected for the intersection Freedom Blvd/Alta Vista Avenue.

Table 1 shows the intersection Level of Service (LOS) based on Highway Capacity Manual (HCM) 6th Edition methodologies.

Table 1: Intersection Level of Service

Intersection	Time Period	Existing	Existing Plus Project
1: Freedom Blvd/ Alta Vista Ave	AM PM	A (8.3) B (16.3)	 B (19.9)
2: Alta Vista/ Driveway A	AM PM	A(8.9) A (9.8)	 A (9.9)
3: Freedom Blvd/ Driveway B	AM PM	B (10.4)- B(12.9)	 B (13.2)

LOS (Delay: Seconds Per Vehicle)
Overall intersection (Signalized[1] & TWSC[2]) | Worst Movement (TWSC[3])
Bold Indicates un-acceptable LOS (Level of Service)
Sources: Synchro 10, Highway Capacity Manual (6th Edition)

Table 2 shows the 95th percentile queue lengths based on HCM 6th Edition methodologies.

Table 2 : Queuing

	Existing Storage Length (ft)		Queuing AM	Queuing PM	Queuing PM
			Existing		Existing Plus Project
1: Freedom Blvd/ Alta Vista Ave	NBL EBL	200 60	59 55	106 **111**	118 **133**
2: Alta Vista/ Driveway A	NBR	50	0	0	0
3: Freedom Blvd/ Driveway B	EBR	50	3	3	4

95th Percentile Queue Length in Feet
Source: Synchro 10
Bold 95th percentile volume exceeds capacity
queue length may be longer
m Volume for 95th percentile is metered by upstream signal
* represents very long storage length (typically greater than 500 feet)
Free – Channelized Free right turn lane

Existing:

All intersections currently operate at an acceptable Level of Service D or better, refer to Table 1 for summary of intersection LOS. Storage is adequate to accommodate the existing queues, except the eastbound left turn lane on Alta Vista Ave during the PM peak hour, as shown in Table 2. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60' bay taper.

Existing Plus Project:

Table 3 shows the vehicle trip generation based on the Institute of Transportation Engineers (ITE) Trip Generation Tenth Edition (2017) rates for the proposed car wash. With these project trips added to the existing volumes all intersections would operate at an acceptable Level of Service D or better, refer to Table 1 for summary of intersection LOS.

Storage is adequate to accommodate the existing queues, except the eastbound left turn lane on Alta Vista Ave during the PM peak hour, as shown in Table 2. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60' bay taper.

Table 3 : Project Trip Generation

Land Use	ITE Code	Quantity	Weekday	Peak Hour	Enter	Exit	Total
Car wash Automated	948	1	0	AM	0	0	**0**
				PM	39	39	**78**
Total Net New Trips			**0**	AM	0	0	**0**
				PM	39	39	**78**

AM and PM Peak Hour Rates are peak hours of adjacent street traffic for AM (7:00-9:00) and PM (4:00-6:00)
KSF: 1000 square feet of gross floor area

Mitigation Measures:

The development would not have a significant impact on the surrounding transportation network, and should be approved as proposed pending fulfillment of the following mitigation measures:

1. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60' bay taper.
2. Provide adequate wayfinding, signage, and illumination on-site to optimize safety and to reduce conflicts among delivery trucks, motorists, cyclists, and pedestrians.
3. Provide onsite bike racks/bike lockers and pedestrian accessibility to all proposed buildings and offsite sidewalk.
4. The project shall pay its fair share of the City-wide traffic impact fee.
5. The City shall continue to monitor traffic operations at Freedom Blvd/Alta Vista Avenue.

2.0 Introduction

This transportation impact report presents the results of a transportation impact study for the proposed car wash located at 1455 Freedom Blvd in Watsonville, California. The project consists o The project consists of an existing convenience market and gas station with eight vehicle-fueling positions. The Developer proposes to construct an automated/self serve car wash with one tunnel. This report is prepared according to the Caltrans "Guide for the preparation of Traffic Impact Studies" (December 2002). The study examines the development's impacts on the surrounding transportation network. The City of Watsonville is the lead agency under the California Environmental Quality Act (CEQA).

2.1 Scope

Per correspondence with the City of Watsonville, the following intersections were identified for Level of Service and Queuing analysis:

1. Freedom Blvd/Alta Vista Avenue
2. Existing driveway on Atla Vista Avenue
3. Existing driveway on Freedom Blvd

The following study scenarios were identified pursuant to the Caltrans TIS Guidelines:

A. Existing
B. Existing Plus Project

The City of Watsonville General Plan 2005 was adopted on May 24, 1994. Therefore, this document is used as the basis for the threshold for operational analysis. The proposed project is consistent with the land designation called in the 2005 General Plan.

Senate Bill (SB) 743, signed in 2013, and codified in the (CEQA) Guidelines in January 2019, changes the way transportation impacts are analyzed in the CEQA process. Vehicle miles traveled (VMT) replaces auto delay and level of service (LOS) as the metric for transportation impact determination. SB 743 went into effect statewide on July 1, 2020. The Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018, provided by Office of Planning and Research, (TA), provides a guidance for screening thresholds for Land Use projects that should be expected to have less than significant impacts without conducting detailed VMT analysis. Small projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact. Based on the projects trip generation as shown in Table 3 above, the project is expected to generate less than 110 trips per day. Therefore qualitative VMT analysis is not provided.

Figure 1 is a Vicinity Map showing the locations of the site, the transportation network, and the study intersections.

2.2 Level of Service Standards

SB 743 and the new Office of Planning and Research (OPR) guidelines do not, however, require lead agencies to abandon LOS for purposes other than CEQA analysis. Some cities have LOS requirements in their general plans. In these jurisdictions, a project may need both a VMT analysis for CEQA purposes and an LOS analysis for purposes of establishing consistency with the general plan.

Level of Service (LOS) is a qualitative measure of transportation flow conditions and their perceptions by transportation system users. Vehicle LOS at intersections and along roadway segments is scaled from "A" (free flow) to "F" (congested, stop and go) according to the Transportation Research Board's (TRB's) Highway Capacity Manual 6th Edition.

Specific Vehicle LOS characteristics are defined in terms of average vehicle delay (seconds per vehicle) for un-signalized and signalized intersections as follows:

A (0-10.0 sec. for un-signalized and signalized)
B (10.1–15.0 sec. for un-signalized, 10.0-20.0 sec. for signalized)
C (15.1-25.0 sec. for un-signalized, 20.1-35.0 sec. for signalized)
D (25.1-35.0 sec. for un-signalized, 35.1-55.0 sec. for signalized)
E (35.1 to 50.0 sec. for un-signalized, 55.1-80.0 sec. for signalized)
F (50.1+ sec. for un-signalized, 80.1+ sec. for signalized)

The "Transportation and Circulation" element of the General Plan indicates the City's goals are to maintain LOS D or better for motorized vehicles on all roadway segments and a LOS of D or better for motorized vehicles at all roadway intersections.

2.3 Project Description

The proposed project is on a 0.527-acre parcel located at 1455 Freedom Blvd in in Watsonville, California. The APN is 016-061-06. The project site is zoned Neighborhood Shopping Center (CNS), with a General Plan Land Use Designation of General Commercial. The site is bordered by Alta Vista Avenue to the north, Freedom Blvd to the east, and existing commercial chopping center to south and west.

The project consists of an existing convenience market and gas station with eight vehicle-fueling positions. The Developer proposes to construct an automated/self serve car wash with one tunnel. Figure 2 is a site plan layout showing the configuration of the site, the on-site access drive aisles and connections to the surrounding transportation network. The project has one existing access to the onto Alta Vista Avenue (Driveway A) and two existing accesses onto Freedom Blvd. The northerly driveway is identified as Driveway B, and the south southerly driveway is identified as Driveway C. Driveway C is an shared access with the adjacent Cabrillo Shopping Center, and is therefore not included in the analysis.

The site access and on-site circulation system was reviewed and deemed safe and compliant with standard transportation planning practices. Motorists would be able to circulate both clockwise and counterclockwise around the fueling island, Convenience Store, and proposed car wash. Pedestrian access is provided by sidewalks and walkways connecting all the existing onsite buildings and offsite sidewalk along Alta Vista Ave. Additionally, the circulation throughout the site was designed to minimize conflicts with bicyclists, pedestrians, and other motorists.

3.0 Existing Conditions

3.1 Transportation Setting

The project study area is in the central area of the City of Watsonville. This study area includes the primary roadways of Freedom Blvd and Alta Vista Avenue that comprise the study intersections.

There are existing sidewalk facilities along Alta Vista Avenue and Freedom Blvd that will allow the nearby residents to access the project via the pedestrian facilities.

Santa Cruz Metro is the primary transit service provider within the County of Santa Cruz, City of Santa Cruz, and City of Watsonville. Santa Cruz Metro currently provides transit services in along Freedom Blvd with several routes, (69A, 71, and 79).

General Plan Figure 10-1 identifies functional classifications for primary study area roadways. These roadways were also observed during field investigations. Roadway characteristics are as follows:

Freedom Blvd is planned as a Minor Arterial roadway, with Class 2 bike lanes on both sides of the street.
Alta Vista is planned as a local roadway.

The following intersections to be analyzed were field verified. The following characteristics were noted:

1 **Freedom Blvd/Alta Vista** is a three-legged signalized intersection with pedestrian crossing on the south side of Freedom Blvd only.

Traffic counts were conducted on Wednesday, December 9, 2020 (for detailed traffic count data refer to Appendix A).

Figure 4 shows the Existing Conditions including roadway and intersection lane configurations, roadway speed limits, and intersection controls for the study intersections. Figure 5 shows the Existing (2020) Traffic Volumes.

3.2 Operational Analysis

The operational analysis was conducted according to the Caltrans "Guide for the Preparation of Traffic Impact Studies" (December 2002) to evaluate compliance with City of Watsonville requirements.

The Level of Service (LOS) for intersections (signalized, All Way Stop, and Two Way Stop) was analyzed using Synchro 10 based on Highway Capacity Manual 6th Edition methodologies.

- Green Time, Yellow Time, and Flashing Don't Walk time are based on CAMUTCD, Caltrans and City of Watsonville standards.
- Green times and cycle lengths are optimized based on volumes.
- Yellow times are based on CA MUTCD requirements based on posted speed.
- Flashing Don't Walk times are based on a walking speed of 3.5 feet per second and total distance from ramp to ramp.
- Peak Hour Factor (PHF) is based on actual intersection counts.

All intersections currently operate at an acceptable Level of Service D, refer to Table 1 for summary of intersection LOS.

3.3 Queuing Analysis

A Queuing Analysis was conducted on Synchro based on 95th percentile queue lengths to assess the adequacy of the turn lane storage lengths. This analysis determines whether the turn storage lengths are adequate (turning movements) and gauges the ability for motorists to access these turn lanes from the through lanes (through movements). Shorter through queue lengths allow motorists to access the turn lanes and clear the intersection in fewer cycles.

Storage is adequate to accommodate the existing queues, except the eastbound left turn lane on Alta Vista Ave during the PM peak hour, as shown in Table 2. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60’ bay taper.

4.0 Project Impacts

4.1 Trip Generation

The project generates primary. Primary trips are defined as vehicle trips that are generated for the primary purpose of using the development. These would mainly include employee, customer, service, and delivery trips made via the automobile. These would not include trips made by transit, bicycle, or on foot. These trips made by alternative transportation modes are initially expected to be relatively low due to the project's location along the urban fringe, the project's characteristics of catering toward the private automobile (gasoline service station with convenience store), and the lack of bicycle and pedestrian facilities along the project site frontage. As such facilities expand within the study area as called for in the Active Transportation Plan, the number of these transit, bicycle, and pedestrian trips would increase, thereby decreasing the number of trips made by the private automobile.

These primary vehicle trips are based on rates in the Institute of Transportation Engineers (ITE) *Trip Generation, Tenth Edition* (2017) for Automated self-serve carwash (948). Internal captured trips are that are shared among on-site land uses. In essence the trip is generated by the project, and then visits multiple land uses during the same trip, therefore should not be counted twice for the entire site, and a reduction should be provided for these internally captured trips. The National Cooperative Highway Research Program (NCHRP) *Report 684 Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* methodology was selected over the ITE *Trip Generation Handbook Second Edition* (June 2004) methodology for calculating these deductions due to improved accuracy (12-13% average absolute error for NCHRP versus 56-59% average absolute error for ITE). For the purposes of the report, no internal trip reductions will be utilized. Pass-by trips are not generated by the project and are vehicle trips that are already on the roadway that make an intermediate stop at the project site on their way to a primary destination. For the purposes of the report, no pass-by trip reductions will be utilized.

The existing gas station and conveience store project trips are already on the roadway and therefore is included in the traffic counts. Net new vehicle trips are those trips that are actually added to the transportation network by the development. Only the proposed carwash will generate new traffic/project trips. They are calculated by subtracting the internal captured and pass-by trips from the base trip generation (primary trips). According to Table 4, the project would generate **0** net new weekday, **0** net new AM peak hour, and **79** net new PM peak hour trips.

4.2 Trip Distribution

Site trips would primarily be a combination of: (1) gasoline, convenience market, and carwash customers traveling to and from home or work making an intermediate stop at the development; (2) shoppers entering the site for the primary purpose of shopping convenience market, (3) Customers utilizing the automated/self serve car wash. Figure 6 shows the Net New Trip Assignments obtained from the Project Trip Generation and the Trip Distribution.

4.3 Onsite Circulation and Safety

Figure 2 is the proposed site plan layout showing the configuration of the site, the on-site access drive aisles. The project has one existing access onto Alta Vista Avenue (Driveway A) and two existing accesses onto Freedom Blvd. The northerly driveway is identified as Driveway B, and the south southerly driveway is identified as Driveway C. Driveway C is an shared access with the adjacent Cabrillo Shopping Center, and is therefore not included in the analysis.

The existing access onto Alta Vista Avenue (Driveway A) is proposed to be closed off. Eastbound traffic on Alta Vista can gain access to the site by using the existing westerly driveway in the Cabrillo shopping center.

The project proposes the carwash with one way circulation for entering and exiting the carwash tunnel. Closing off the existing access onto Alta Vista Avenue (Driveway A) does not cause any conflicts and allows additional vehicle stacking and queuing when entering the carwash tunnel.

The site access and on-site circulation system was reviewed and deemed safe and compliant with standard transportation planning practices. Motorists would be able to circulate both clockwise and counterclockwise around the fueling island, Convenience Store. Pedestrian access is provided by sidewalks and walkways connecting all the existing onsite buildings and offsite sidewalk along Alta Vista Ave. Additionally, the circulation throughout the site was designed to minimize conflicts with bicyclists, pedestrians, and other motorists.

The site layout has been designed to allow service vehicles access to the underground fueling tanks as needed with minimal conflicts with pedestrians and other vehicles. The trash enclosure is conveniently located at the southeast area of the development to allow solid waste trucks easy access to service the trash bins.

Pedestrian access is provided by a sidewalk and walkway connecting all the proposed building and offsite sidewalk along Alta Vista Ave, with minimal conflicts with vehicular traffic. Bicycle racks/lockers should be provided onsite to encourage multi-modal access to the project site.

5.0 Existing Plus Project Conditions

5.1 Transportation Setting

The project has one existing access to the onto Alta Vista Avenue (Driveway A) and two existing accesses onto Freedom Blvd. Figure 7 shows the Existing Conditions including roadway and intersection lane configurations, roadway speed limits, and intersection controls for the study intersections. Figure 8 shows the Existing plus Project volumes.

There are no proposed improvements to Freedom Blvd or Alta Vista Ave, other than the proposed sidewalk connection to Alta Vista Ave. Other onsite recommendations to reduce vehicular travel would be to install onsite bike racks/bike lockers, and proposed pedestrian paths to accommodate and encourage bicyclist and pedestrian visitors, removal of the existing pedestrian path from Freedom Blvd, as this path has several conflicts with vehicular traffic.

5.2 Operational Analysis

All intersections would operate at an acceptable Level of Service D or better, refer to Table 1 for summary of intersection LOS.

5.3 Queuing Analysis

A queuing analysis was conducted using Synchro 10 to determine the 95th percentile projected queue lengths to assess the adequacy of the turn lane storage lengths. Storage is adequate to accommodate the existing queues, except the eastbound left turn lane on Alta Vista Ave during the PM peak hour, as shown in Table 2. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60’ bay taper.

6.0 Conclusions and Recommendations

6.1 Summary of Impacts

The Transportation Impact Study for the Gas Station and Carwash development located at 1455 Freedom Blvd was prepared to examine the multi-modal transportation impacts of the proposed retail development on the surrounding transportation network, and recommend measures to mitigate significant impacts.

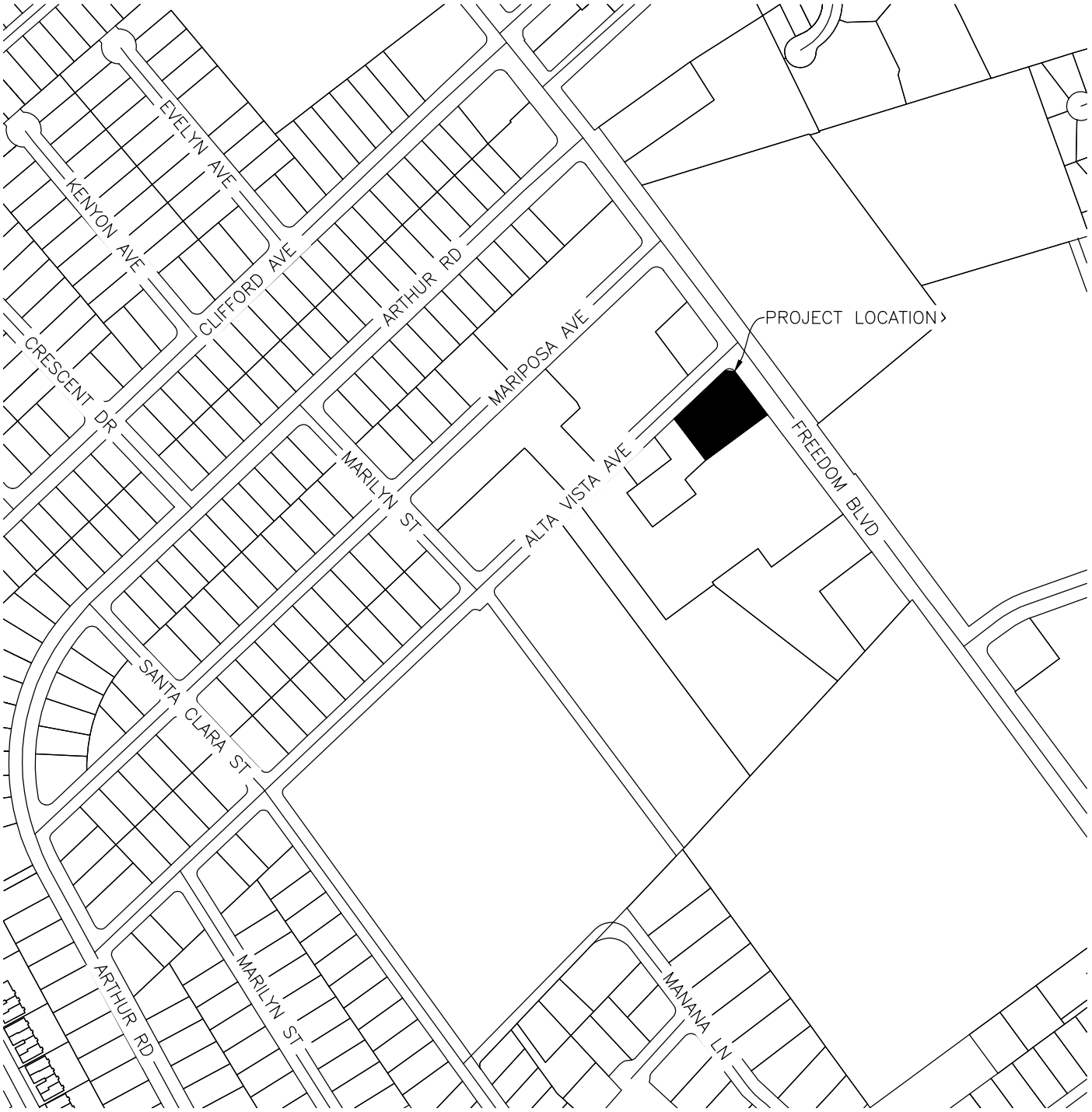
All intersections operate at an acceptable Level of Service D or better, refer to Table 1 for summary of intersection LOS. Storage is adequate to accommodate the existing queues, as shown in Table 2.

6.2 Recommendations

It is recommended the project implement the following improvements:

1. It is recommended the EBL turn lane on Alta Vista Ave be extended to provide for 130 feet of storage with a 60’ bay taper.
2. Provide adequate wayfinding, signage, and illumination on-site to optimize safety and to reduce conflicts among delivery trucks, motorists, cyclists, and pedestrians.
3. Provide onsite bike racks/bike lockers and pedestrian accessibility to all proposed buildings and offsite sidewalk.
4. The project shall pay its fair share of the City-wide traffic impact fee.
5. The City shall continue to monitor traffic operations at Freedom Blvd/Alta Vista Avenue.

Figure 1 – Vicinity Map



NOT TO SCALE

VICE
VANG INC. CONSULTING ENGINEERS

WATSONVILLE CARWASH
VICINITY MAP

PREPARED FOR: CVEAS
DATE: 1/19/21
PROJECT: 20-073

FIGURE 1

1/21/2021 6:51 PM

V:\PROJECTS\2020\2020-073 WATSONVILLE TIS\03-PROJECT REPORTS\TIS\20-073 TRAFFIC VOLUMES.DWG

Figure 2 – Site Plan

PROPOSED SITE PLAN

SCALE: 1:10

SITE KEY NOTES

1	(E) 6" HIGH CONC. CURB AND GUTTER.
2	(E) STREET SIDEWALK TO REMAIN.
3	(E) 6" HIGH CONCRETE CURB TO REMAIN.
4	(E) AIR/WATER DISPENSER TO REMAIN.
5	(E) DRIVEWAY APPROACH TO BE REMOVED. CONSTRUCT NEW CURB AND GUTTER PER CITY STD S-101.
6	(E) EDGE OF CONCRETE SLAB TO REMAIN.
7	(E) POWER POLE TO REMAIN.
8	(E) LANDSCAPE AREA.
9	NEW LOCATION OF (E) TOW-AWAY SIGN.
10	(E) CURB RAMP TO REMAIN.
11	(E) WATER METER TO REMAIN.
12	(E) AC PAVING.
13	(E) BACK-FLOW PREVENTER.
14	(E) UNDERGROUND FUEL TANK(S).
15	NEW LOCATION OF (E) SELF-SERVE AIR / WATER DISPENSER.
16	(E) 6"ø STEEL BOLLARD(S). REFER TO DETAIL
17	(E) SIDEWALK ON FRONT OF STORE TO REMAIN.
18	(E) CURB RAMP TO REMAIN.
19	(E) --
20	(E) GUY WIRE TO REMAIN.
21	(E) FUEL PRICE SIGN TO REMAIN.
22	(E) STREET LIGHT AND TRAFFIC POLE.
23	(E) SPEED LIMIT SIGN.
24	(E) HOOD LIGHT POLE TO REMAIN.
25	(E) UNDERGROUND FUEL TANK(S) TO REMAIN.
26	(E) PARKING STRIPES TO REMAIN.
27	(E) ELECTRIC SWITCHGEAR TO REMAIN. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFO.
28	(E) WATER LINE TO (E) BLDG.
29	(E) FIRE RISER.
30	(E) FIRE HYDRANT.
31	(N) TRUNCATED DOME(S) PER DETAIL 2/A1.2.
32	(N) DIRECTIONAL ARRON PER DETAIL 7/A1.2.
33	(N) PEDESTRAIN PATH OF TRAVEL FROM PUBLIC SIDEWALK TO (E) STORE BLDG.
34	(N) ACCESSIBLE PARKING STALL. REFER TO DETAIL 3/A1.2.
35	(N) ACCESSIBLE AISLE. REFER TO DETAIL 3/A1.2.
36	(N) 4" PEDESTRIAN STRIPPING.
37	(N) ACCESSIBLE POLE SIGN. REFER TO DETAIL 5/A1.2.
38	(N) HOODED LIGHT POLE. REFER TO DETAIL 9/A1.2.
39	(N) 6" HIGH WHEEL STRIP. REFER TO DETAIL 8/A1.2.
40	(N) AC PAVING. MATCH EXISTING AC PAVING.
41	(N) ACCESSIBLE RAMP. REFER TO GRADING PLAN.
42	(N) LANDSCAPE AREA.
43	(N) CONCRETE SLAB. REFER TO DETAIL 10 AND 11/A1.2.
44	(N) DRIVE-THRU INTO CARWASH BLDG.
45	(N) 6" HIGH CONCRETE CURB. MATCH (E) CURB.
46	(N) TRASH ENCLOSURE PER CITY STANDARD S-602. REFER TO DETAILS ON SHEET A1.4 FOR THE TRASH ENCLOSURE COVER.
47	(N) ELECTRICAL TRANSFORMER. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFO.
48	(N) UNDERGROUND ELECTRICAL LINE. REFER TO ELECTRICAL PLANS FOR ADDITIONAL INFO. REFER TO CITY STD S401 FOR ALL TRENCHING INFILL.
49	(N) TRASH ENCLOSURE PER CITY STANDARD S-602.
50	(N) 3'-6" HIGH WROUGHT-IRON FENCE. REFER TO DETAILS ON SHEET A1.4.
51	INDICATES CAR QUEUING. REFER TO TIS FOR ADDT'NL INFO.
52	--
53	(N) DRAIN INLET(S).
54	(N) VALLEY GUTTER TO PREVENT STORM WATER FROM DRAINING INTO THE CARWASH RECLAMATION SYSTEM.
55	(N) POINT OF CONNECTION TO STORM WATER DRAINAGE MAIN.

WASTEWATER DISCHARGE PRETREATMENT NOTE:
PRETREATMENT OF THE WASTEWATER FROM THE CARWASH MUST BE SUBMITTED AND OBTAIN APPROVAL FROM THE SOURCE CONTROL PRIOR TO DISCHARGING TO THE CITY SEWER.

PEDESTRIAN PATH OF TRAVEL NOTES:
THE PEDESTRIAN ROUTE SHALL BE A MINIMUM OF 48" WIDE WITH A MAXIMUM CROSS SLOPE OF 2% AND A MAXIMUM RUNNING SLOPE OF 5%, UNLESS A COMPLIANT RAMP IS UTILIZED

STORMWATER DISCHARGE NOTE:
ALL STORM WATER MUST DISCHARGE AWAY FROM THE CARWASH RECLAMATION SYSTEM.

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Email: info@cveas.com

PROJECT
WATSONVILLE CARWASH BLDG.
1455 FREEDOM BLVD.
AND ALTA VISTA AVE.
WATSONVILLE, CA 95076
APN - 016-061-06

REGISTERED PROFESSIONAL ENGINEER
RICARDO LEAL
No. C 77675
Exp. 06-30-21
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 4/1/2021

Revisions:	Date:
1 SPR REVISION #1	11-16-2020
2 SPR REVISION #2	03-26-2021

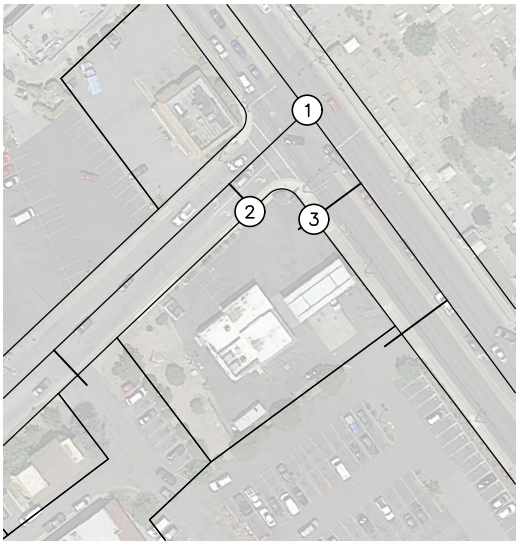
PROPOSED SITE PLAN

CVEAS JOB # :	19030
DATE:	08-12-2020
PLANNING SUBMITTAL #:	APPLICATION #627
PLAN CHECK SUBMITTAL #:	XX-XXXX
DRAWN BY:	CVEAS INC
CHECKED BY:	RL
SCALE:	AS NOTED

A1.1

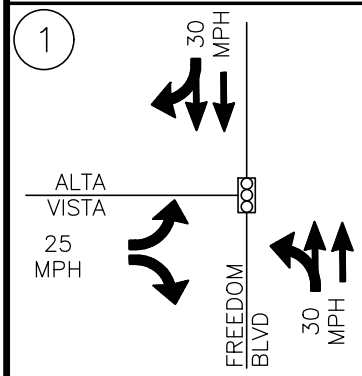
CIVIL ENGINEERING • LAND SURVEYING • CONSULTING • STRUCTURAL DESIGN • ARCHITECTURAL DRAFTING • COMMERCIAL & RESIDENTIAL BUILDING DESIGN • PLANNING & PROJECT MANAGEMENT

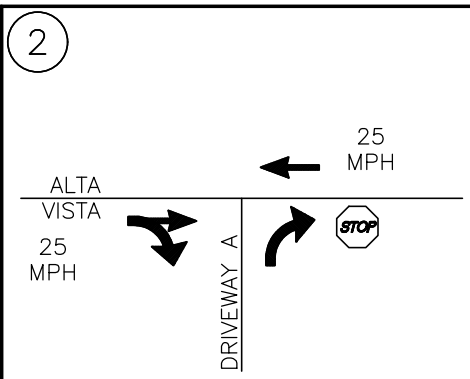
Figure 3 – Existing Conditions

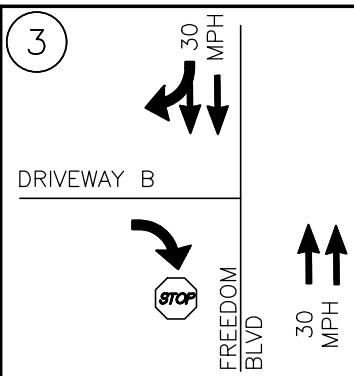


LEGEND

##	AM PEAK HOUR VOLUME
(##)	PM PEAK HOUR VOLUME
→	DIRECTION OF TRAVEL PER LANE
	SIGNALIZED INTERSECTION
STOP	UNSIGNALIZED INTERSECTION
#	INTERSECTION NUMBER







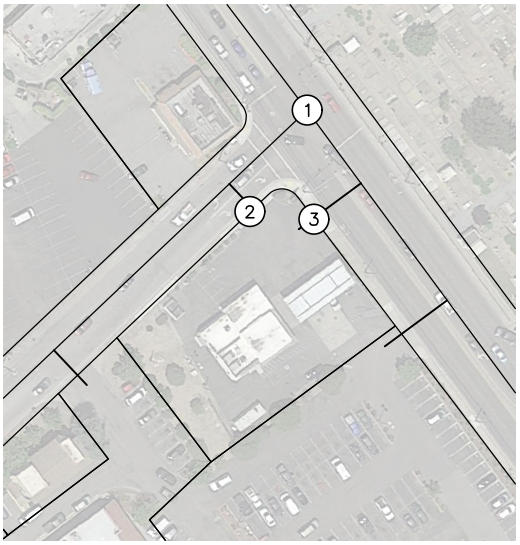
VICE
VANG INC. CONSULTING ENGINEERS

WATSONVILLE CARWASH
EXISTING 2020 TRAFFIC CONDITIONS

PREPARED FOR: CVEAS
DATE: 1/19/21
PROJECT: 20-073

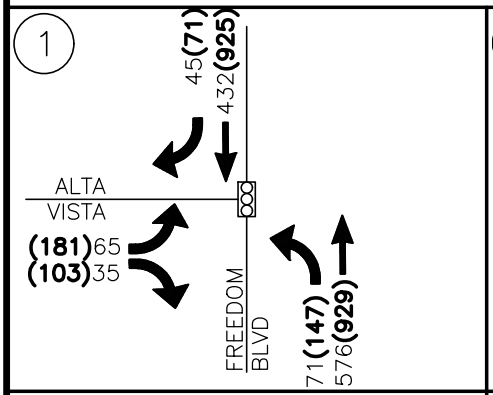
FIGURE 3

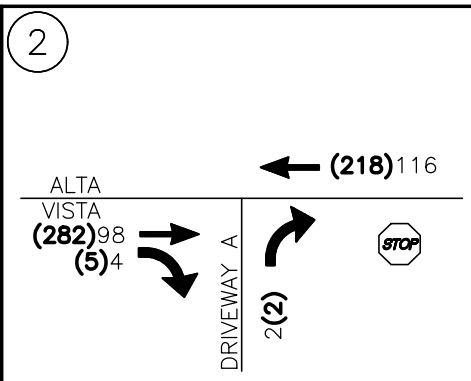
Figure 4 – Existing Traffic Volume

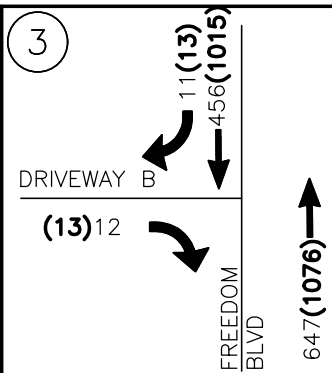


LEGEND

##	AM PEAK HOUR VOLUME
(##)	PM PEAK HOUR VOLUME
→	DIRECTION OF TRAVEL PER LANE
	SIGNALIZED INTERSECTION
STOP	UNSIGNALIZED INTERSECTION
#	INTERSECTION NUMBER

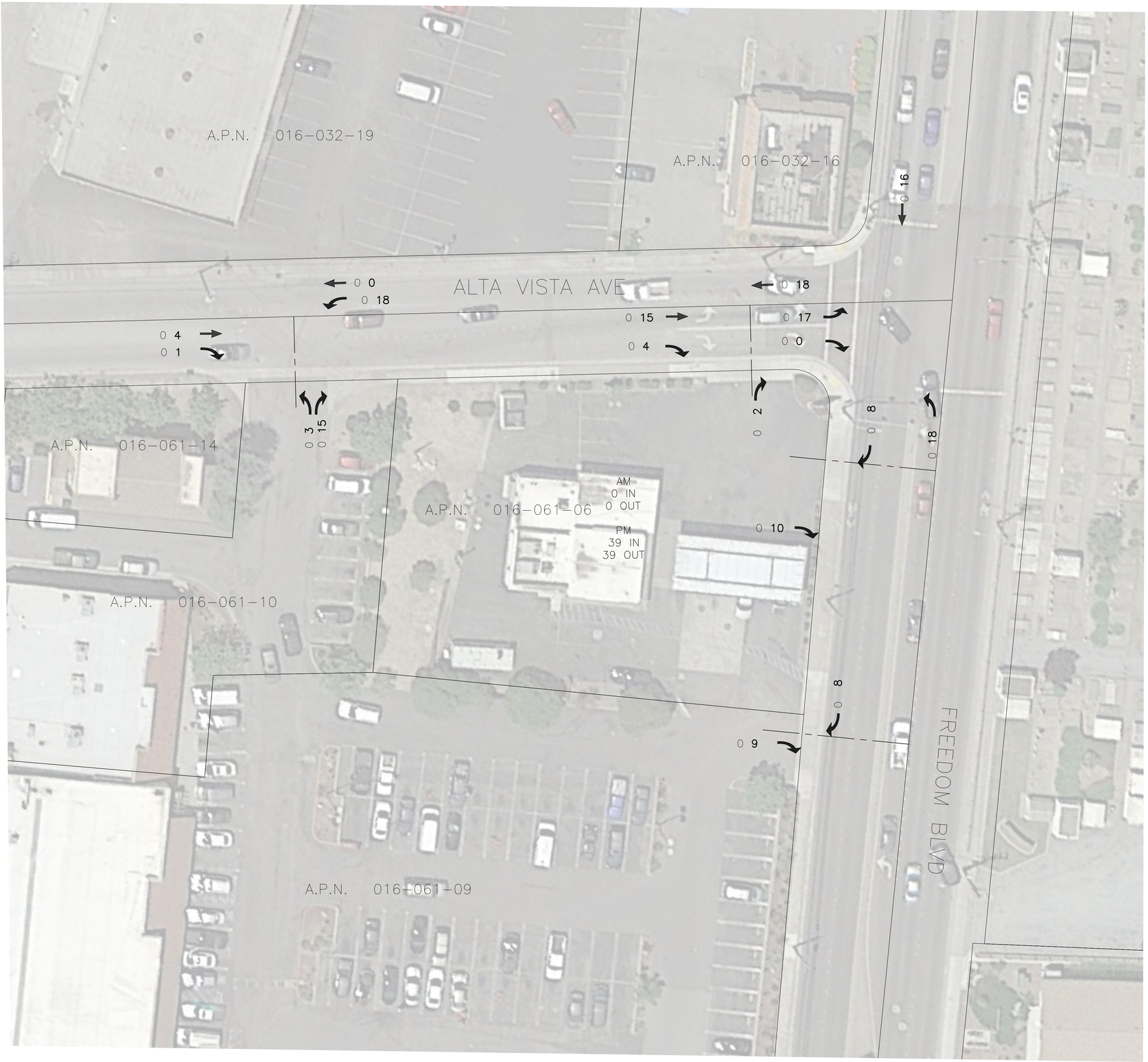






VICE VANG INC. CONSULTING ENGINEERS	WATSONVILLE CARWASH EXISTING 2020 TRAFFIC VOLUMES	PREPARED FOR: CVEAS DATE: 1/19/21 PROJECT: 20-073	FIGURE 4

Figure 5 - Project Trip Distribution



VICINITY MAP
NOT TO SCALE

PROJECT INFO:

PROJECT LOCATION: ADDRESS
FRESNO, CA 93728

APN: 016-061-06

LEGEND

AM TRIPS
PM TRIPS

20 10 0 20 40
SCALE IN FEET
1" = 20'

REVISIONS

NO.	DATE	BY

2491 ALLUVIAL AVE
CLOVIS, CA 93619
(559) 775-0023
FAX: (559) 775-0016
WWW.VICE-ENGR.COM

VICE
VANG INC. CONSULTING ENGINEERS

WATSONVILLE CARWASH

FIGURE 5 - TRIP DISTRIBUTION

CITY OF FRESNO

DRAWN BY: LSV

PROJ. ENGR: LSV

PROJ. MNGR: KYV

PREPARED FOR:
NICK SAHOTA
CENTRAL VALLEY ENGINEERING & SURVEYING, INC.
2132 HIGH ST.
SELMA, CA
93662

REGISTERED PROFESSIONAL ENGINEER
KYENG YING VANG
NO. C-63824
CIVIL
STATE OF CALIFORNIA

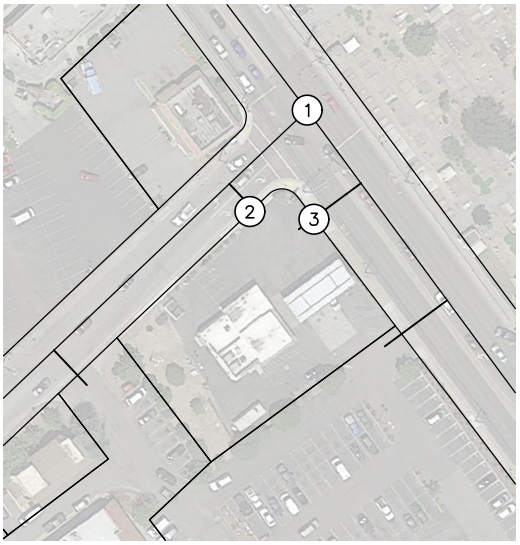
SHEET NO.
1 / 1

PROJECT NUMBER
20-073

1/21/2021 6:09 PM

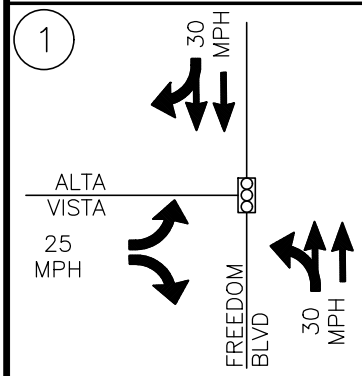
V:\PROJECTS\2020\2020-073 WATSONVILLE TIS\03-PROJECT REPORTS\TIS\20-073 TRIP DISTRIBUTION.DWG

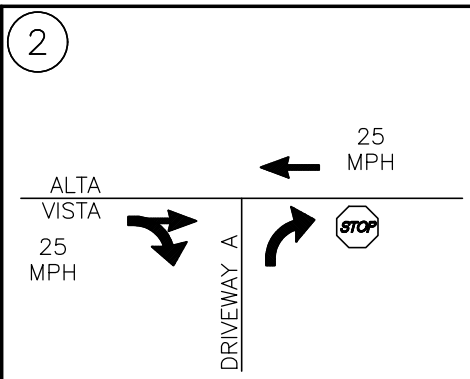
Figure 6 – Existing Plus Project Conditions

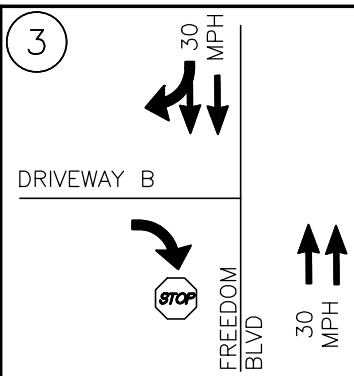


LEGEND

##	AM PEAK HOUR VOLUME
(##)	PM PEAK HOUR VOLUME
→	DIRECTION OF TRAVEL PER LANE
	SIGNALIZED INTERSECTION
STOP	UNSIGNALIZED INTERSECTION
#	INTERSECTION NUMBER







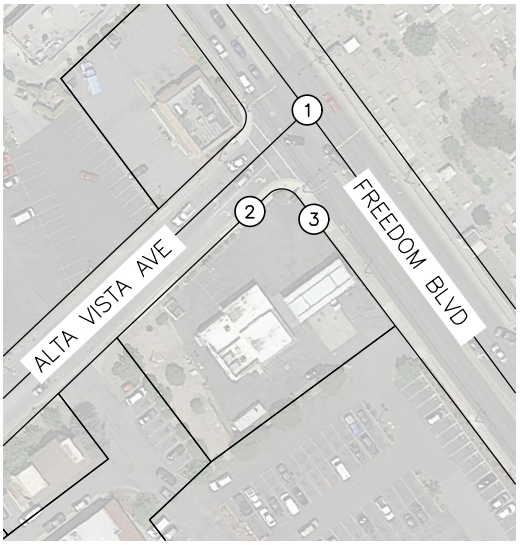
VICE
VANG INC. CONSULTING ENGINEERS

WATSONVILLE CARWASH
EXISTING 2020 PLUS PROJECT TRAFFIC CONDITIONS

PREPARED FOR: CVEAS
DATE: 1/19/21
PROJECT: 20-073

FIGURE 6

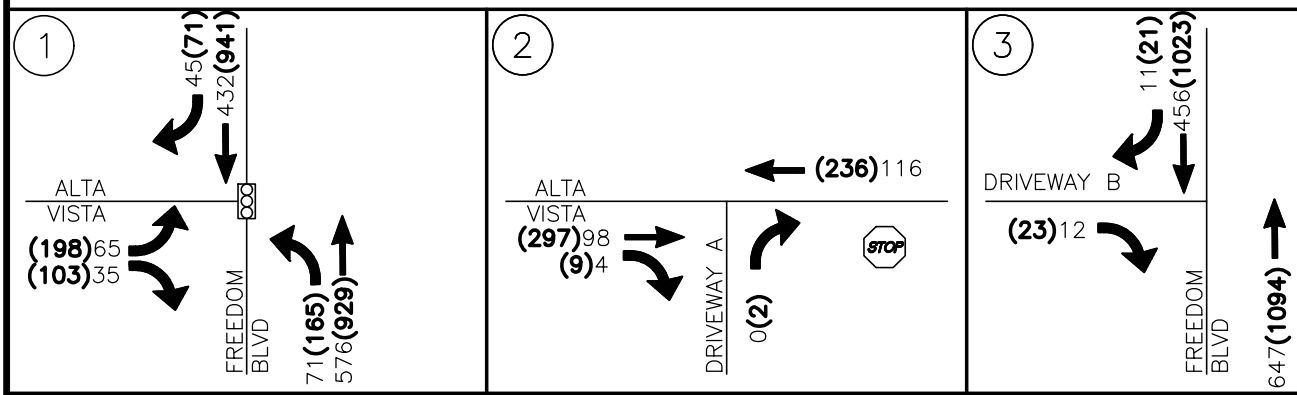
Figure 7 – Existing Plus Project Traffic Volumes



N

LEGEND

##	AM PEAK HOUR VOLUME
(##)	PM PEAK HOUR VOLUME
→	DIRECTION OF TRAVEL PER LANE
▯	SIGNALIZED INTERSECTION
STOP	UNSIGNALIZED INTERSECTION
#	INTERSECTION NUMBER



VICE VANG INC. CONSULTING ENGINEERS	WATSONVILLE CARWASH EXISTING 2020 PLUS PROJECT TRAFFIC VOLUMES	PREPARED FOR: CVEAS DATE: 1/19/21 PROJECT: 20-073	FIGURE 7

Appendix A: Traffic Counts

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:

VICE
2491 Alluvial Ave Ste 15
Clovis, CA 93611

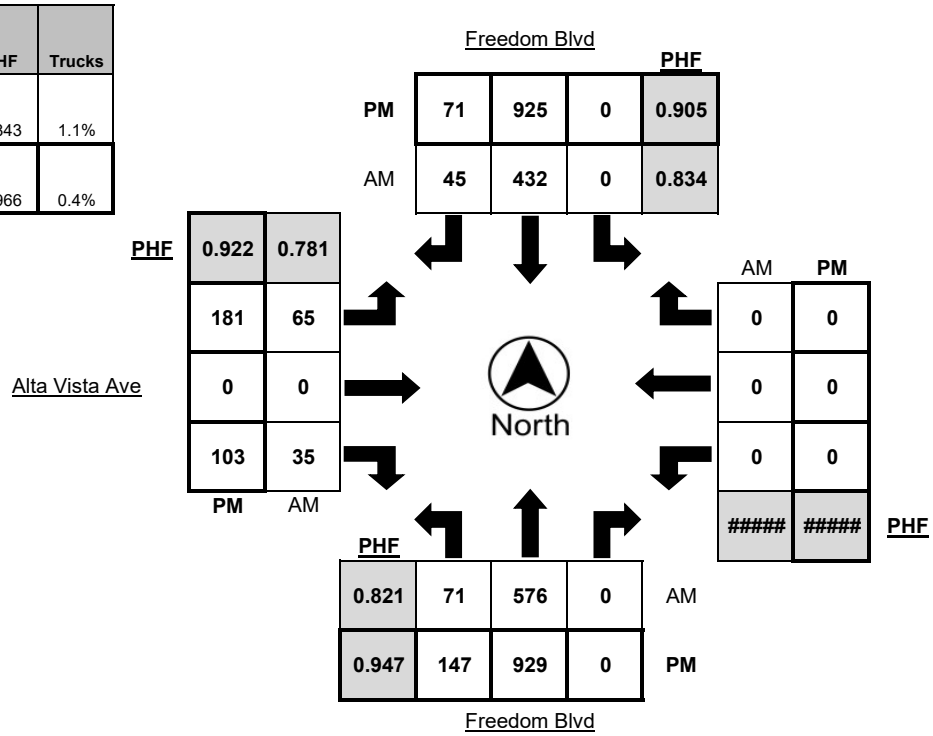
LOCATION Freedom Blvd @ Alta Vista Ave
LATITUDE 36.9284
COUNTY Santa Cruz
LONGITUDE -121.7664
COLLECTION DATE Wednesday, December 9, 2020
WEATHER Clear

	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	10	101	0	1	0	81	4	2	12	0	3	0	0	0	0	0
7:15 AM - 7:30 AM	8	98	0	1	0	83	6	0	11	0	8	1	0	0	0	0
7:30 AM - 7:45 AM	19	145	0	2	0	110	7	0	15	0	4	0	0	0	0	0
7:45 AM - 8:00 AM	20	177	0	1	0	125	18	1	15	0	8	0	0	0	0	0
8:00 AM - 8:15 AM	19	116	0	2	0	106	8	0	20	0	12	0	0	0	0	0
8:15 AM - 8:30 AM	13	138	0	3	0	91	12	1	15	0	11	3	0	0	0	0
8:30 AM - 8:45 AM	11	118	0	3	0	102	7	2	20	0	8	1	0	0	0	0
8:45 AM - 9:00 AM	25	117	0	2	0	119	8	3	22	0	7	1	0	0	0	0
TOTAL	**125**	**1010**	**0**	**15**	**0**	**817**	**70**	**9**	**130**	**0**	**61**	**6**	**0**	**0**	**0**	**0**

	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	35	211	0	0	0	238	14	2	47	0	20	0	0	0	0	0
4:15 PM - 4:30 PM	42	228	0	1	0	256	19	1	40	0	25	0	0	0	0	0
4:30 PM - 4:45 PM	27	236	0	2	0	222	13	2	48	0	28	0	0	0	0	0
4:45 PM - 5:00 PM	37	247	0	0	0	209	15	1	38	0	28	0	0	0	0	0
5:00 PM - 5:15 PM	41	218	0	1	0	238	24	2	55	0	22	0	0	0	0	0
5:15 PM - 5:30 PM	29	212	0	2	0	255	18	1	31	0	27	0	0	0	0	0
5:30 PM - 5:45 PM	31	214	0	2	0	222	15	1	52	0	15	0	0	0	0	0
5:45 PM - 6:00 PM	27	185	0	0	0	177	17	1	36	0	18	0	0	0	0	0
TOTAL	**269**	**1751**	**0**	**8**	**0**	**1817**	**135**	**11**	**347**	**0**	**183**	**0**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	71	576	0	8	0	432	45	2	65	0	35	3	0	0	0	0
4:15 PM - 5:15 PM	147	929	0	4	0	925	71	6	181	0	103	0	0	0	0	0

	PHF	Trucks
AM	0.843	1.1%
PM	0.966	0.4%



Metro Traffic Data Inc.
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Hanford, CA 93230

800-975-6938 Phone/Fax
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Turning Movement Report

Prepared For:

VICE
2491 Alluvial Ave Ste 15
Clovis, CA 93611

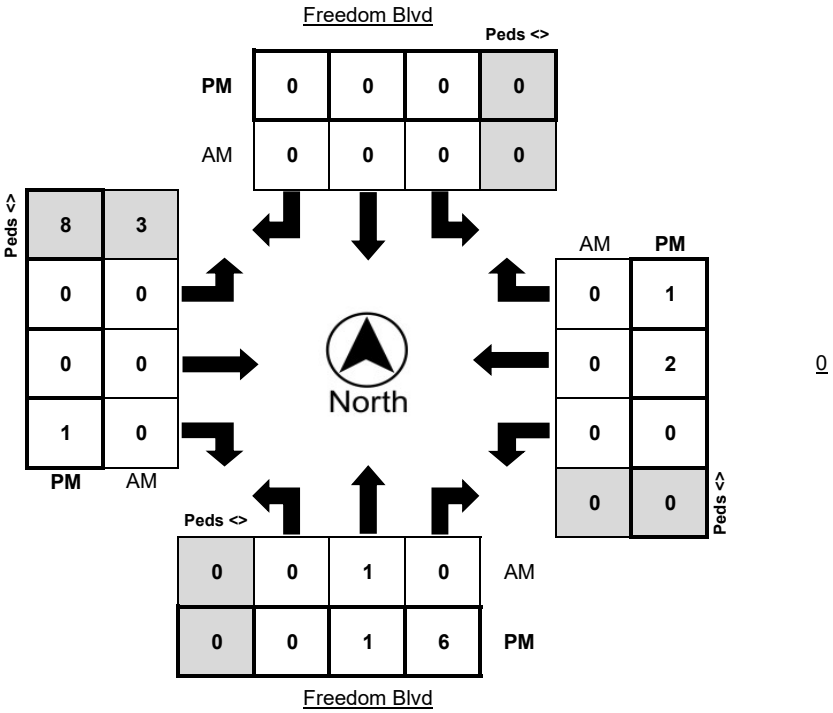
LOCATION Freedom Blvd @ Alta Vista Ave
LATITUDE 36.9284
COUNTY Santa Cruz
LONGITUDE -121.7664
COLLECTION DATE Wednesday, December 9, 2020
WEATHER Clear

	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	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**

	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM - 4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	3
4:45 PM - 5:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00 PM - 5:15 PM	0	1	2	0	0	0	0	0	0	0	1	0	0	1	0	3
5:15 PM - 5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
TOTAL	**0**	**1**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**12**

	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
7:30 AM - 8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:15 PM - 5:15 PM	0	1	6	0	0	0	0	0	0	0	1	0	0	2	1	8

	Bikes	Peds
AM Peak Total	1	3
PM Peak Total	11	8



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

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

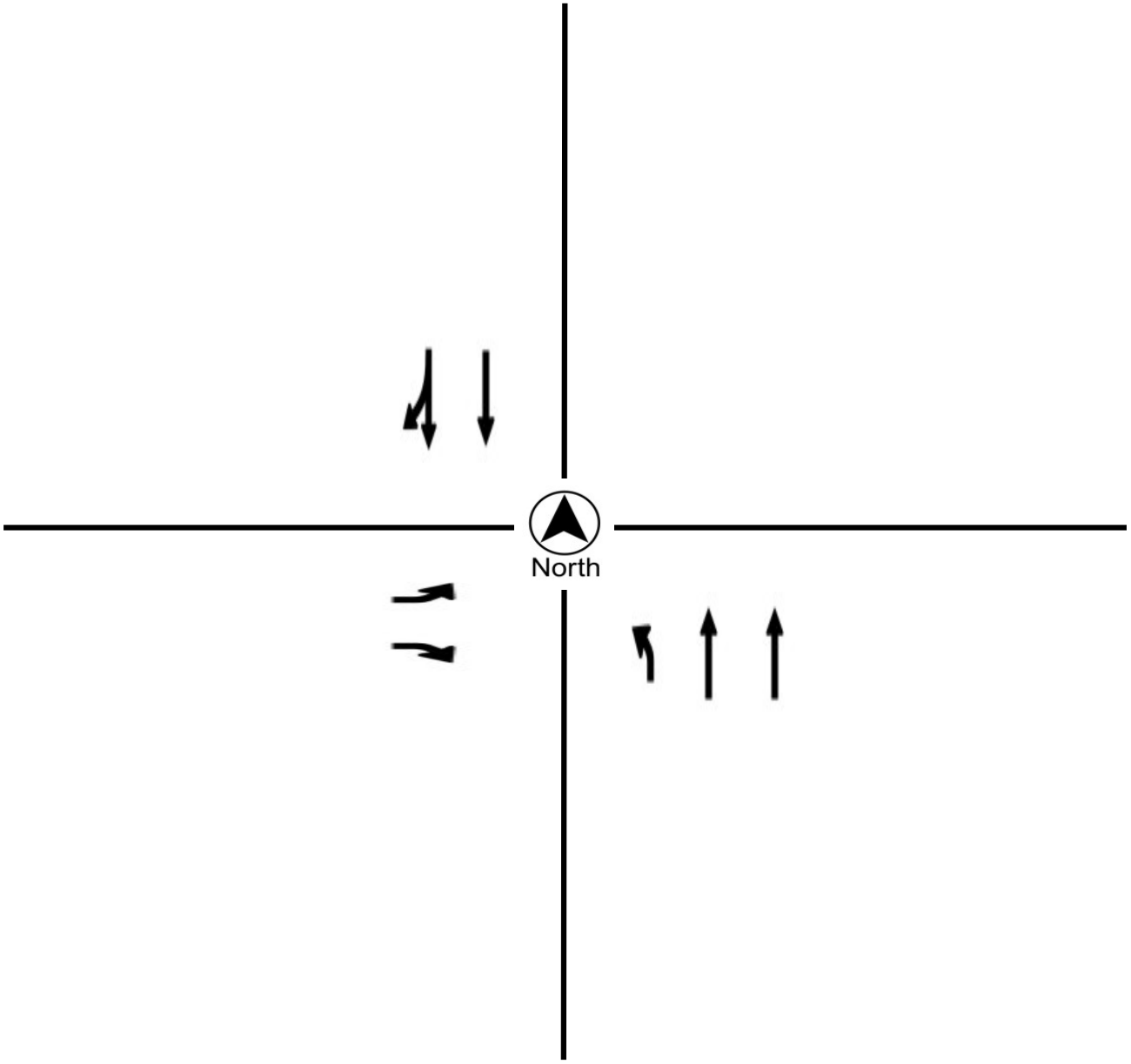
Turning Movement Report

Prepared For:

VICE
2491 Alluvial Ave Ste 15
Clovis, CA 93611

LOCATION	Freedom Blvd @ Alta Vista Ave	**N/S STREET**	Freedom Blvd
COUNTY	Santa Cruz	**E/W STREET**	Alta Vista Ave
COLLECTION DATE	Wednesday, December 9, 2020	**WEATHER**	Clear
CYCLE TIME	97 Seconds	**CONTROL TYPE**	Signal

COMMENTS Northbound left turns are protected.



Appendix B: Synchro Reports

Appendix B-1: Existing Scenario(s)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	35	71	576	432	45
Future Volume (vph)	65	35	71	576	432	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	60	0	200			0
Storage Lanes	1	1	1			0
Taper Length (ft)	75		75			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99		1.00	
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3475	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1754	1551	1758	3539	3475	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		42			19	
Link Speed (mph)	25			30	30	
Link Distance (ft)	76			160	797	
Travel Time (s)	2.1			3.6	18.1	
Confl. Peds. (#/hr)	10	10	10			10
Confl. Bikes (#/hr)						11
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	77	42	85	686	514	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	42	85	686	568	0
Enter Blocked Intersection	Yes	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	26.7	26.7	9.7	26.7	26.7	
Total Split (s)	26.7	26.7	10.0	32.5	26.7	
Total Split (%)	42.1%	42.1%	15.8%	51.3%	42.1%	
Maximum Green (s)	22.0	22.0	5.3	27.8	22.0	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Max	C-Max	
Walk Time (s)					7.0	
Flash Dont Walk (s)					15.0	
Pedestrian Calls (#/hr)					10	
Act Effct Green (s)	8.2	8.2	8.6	48.8	37.6	
Actuated g/C Ratio	0.13	0.13	0.14	0.77	0.59	
v/c Ratio	0.34	0.18	0.36	0.25	0.27	
Control Delay	28.5	10.4	28.4	3.3	9.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.5	10.4	28.4	3.3	9.4	
LOS	C	B	C	A	A	
Approach Delay	22.1			6.1	9.4	
Approach LOS	C			A	A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 63.4			
Actuated Cycle Length: 63.4			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 38.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: FREEDOM & ALTA VISTA

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	77	42	85	686	568
v/c Ratio	0.34	0.18	0.36	0.25	0.27
Control Delay	28.5	10.4	28.4	3.3	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	10.4	28.4	3.3	9.4
Queue Length 50th (ft)	28	0	30	35	59
Queue Length 95th (ft)	55	20	59	59	98
Internal Link Dist (ft)	1			80	717
Turn Bay Length (ft)	60		200		
Base Capacity (vph)	614	565	239	2724	2069
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.07	0.36	0.25	0.27

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	35	71	576	432	45
Future Volume (veh/h)	65	35	71	576	432	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	42	85	686	514	54
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	124	110	109	2777	2087	218
Arrive On Green	0.07	0.07	0.06	0.78	0.65	0.65
Sat Flow, veh/h	1781	1585	1781	3647	3327	338
Grp Volume(v), veh/h	77	42	85	686	282	286
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1795
Q Serve(g_s), s	2.6	1.6	3.0	3.3	4.2	4.2
Cycle Q Clear(g_c), s	2.6	1.6	3.0	3.3	4.2	4.2
Prop In Lane	1.00	1.00	1.00			0.19
Lane Grp Cap(c), veh/h	124	110	109	2777	1147	1159
V/C Ratio(X)	0.62	0.38	0.78	0.25	0.25	0.25
Avail Cap(c_a), veh/h	622	554	150	2777	1147	1159
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	28.0	29.1	1.9	4.7	4.7
Incr Delay (d2), s/veh	5.0	2.2	15.9	0.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	1.7	0.5	1.3	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.5	30.2	45.0	2.1	5.2	5.2
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	119			771	568	
Approach Delay, s/veh	32.3			6.8	5.2	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		53.9		9.1	8.6	45.4
Change Period (Y+Rc), s		* 4.7		* 4.7	* 4.7	* 4.7
Max Green Setting (Gmax), s		* 28		* 22	* 5.3	* 22
Max Q Clear Time (g_c+I1), s		5.3		4.6	5.0	6.2
Green Ext Time (p_c), s		4.9		0.3	0.0	3.1

Intersection Summary		
HCM 6th Ctrl Delay		8.3
HCM 6th LOS		A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	98	4	0	116	0	2
Future Volume (vph)	98	4	0	116	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		20	0		0	25
Storage Lanes		1	0		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1583	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1863	1583	0	1863	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	1807			444	226	
Travel Time (s)	49.3			12.1	6.2	
Confl. Bikes (#/hr)		10				10
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	117	5	0	138	0	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	117	5	0	138	0	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 15.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	98	4	0	116	0	2
Future Vol, veh/h	98	4	0	116	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	117	5	0	138	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	117
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	935
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	935
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	935	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-
HCM Control Delay (s)	8.9	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	12	0	647	456	11
Future Volume (vph)	0	12	0	647	456	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			25
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3525	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3525	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	243			710	430	
Travel Time (s)	6.6			16.1	9.8	
Confl. Peds. (#/hr)		10				10
Confl. Bikes (#/hr)		11				11
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	14	0	770	543	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	14	0	770	556	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	12	0	647	456	11
Future Vol, veh/h	0	12	0	647	456	11
Conflicting Peds, #/hr	0	10	0	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	0	770	543	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	298	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	698	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	685	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	685	-	-
HCM Lane V/C Ratio	-	0.021	-	-
HCM Control Delay (s)	-	10.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	181	103	147	929	925	71
Future Volume (vph)	181	103	147	929	925	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	60	0	200			0
Storage Lanes	1	1	1			0
Taper Length (ft)	75		75			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	1.00		1.00	
Frt		0.850			0.989	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3489	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1754	1551	1764	3539	3489	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		106			14	
Link Speed (mph)	25			30	30	
Link Distance (ft)	76			160	797	
Travel Time (s)	2.1			3.6	18.1	
Confl. Peds. (#/hr)	10	10	10			10
Confl. Bikes (#/hr)						11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	187	106	152	958	954	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	106	152	958	1027	0
Enter Blocked Intersection	Yes	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	26.7	26.7	9.7	26.7	26.7	
Total Split (s)	26.7	26.7	10.0	32.5	26.7	
Total Split (%)	42.1%	42.1%	15.8%	51.3%	42.1%	
Maximum Green (s)	22.0	22.0	5.3	27.8	22.0	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Max	C-Max	
Walk Time (s)					7.0	
Flash Dont Walk (s)					15.0	
Pedestrian Calls (#/hr)					10	
Act Effct Green (s)	12.0	12.0	12.1	42.0	25.2	
Actuated g/C Ratio	0.19	0.19	0.19	0.66	0.40	
v/c Ratio	0.56	0.28	0.45	0.41	0.74	
Control Delay	29.2	6.8	27.8	6.1	21.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	6.8	27.8	6.1	21.3	
LOS	C	A	C	A	C	
Approach Delay	21.1			9.1	21.3	
Approach LOS	C			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 63.4			
Actuated Cycle Length: 63.4			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: FREEDOM & ALTA VISTA

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	187	106	152	958	1027
v/c Ratio	0.56	0.28	0.45	0.41	0.74
Control Delay	29.2	6.8	27.8	6.1	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	6.8	27.8	6.1	21.3
Queue Length 50th (ft)	66	0	52	74	171
Queue Length 95th (ft)	111	32	106	134	#291
Internal Link Dist (ft)	1			80	717
Turn Bay Length (ft)	60		200		
Base Capacity (vph)	614	607	337	2345	1396
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.17	0.45	0.41	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	103	147	929	925	71
Future Volume (veh/h)	181	103	147	929	925	71
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	187	106	152	958	954	73
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	255	227	150	2514	1830	140
Arrive On Green	0.14	0.14	0.08	0.71	0.55	0.55
Sat Flow, veh/h	1781	1585	1781	3647	3428	255
Grp Volume(v), veh/h	187	106	152	958	508	519
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1813
Q Serve(g_s), s	6.3	3.9	5.3	6.8	11.4	11.4
Cycle Q Clear(g_c), s	6.3	3.9	5.3	6.8	11.4	11.4
Prop In Lane	1.00	1.00	1.00			0.14
Lane Grp Cap(c), veh/h	255	227	150	2514	975	995
V/C Ratio(X)	0.73	0.47	1.01	0.38	0.52	0.52
Avail Cap(c_a), veh/h	622	554	150	2514	975	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	24.8	28.9	3.7	9.0	9.0
Incr Delay (d2), s/veh	4.0	1.5	77.3	0.4	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.5	5.4	1.6	4.1	4.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	26.3	106.2	4.1	11.0	10.9
LnGrp LOS	C	C	F	A	B	B
Approach Vol, veh/h	293			1110	1027	
Approach Delay, s/veh	28.6			18.1	11.0	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.3		13.7	10.0	39.3
Change Period (Y+Rc), s		* 4.7		* 4.7	* 4.7	* 4.7
Max Green Setting (Gmax), s		* 28		* 22	* 5.3	* 22
Max Q Clear Time (g_c+I1), s		8.8		8.3	7.3	13.4
Green Ext Time (p_c), s		6.8		0.8	0.0	4.2

Intersection Summary		
HCM 6th Ctrl Delay		16.3
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	282	5	0	218	0	2
Future Volume (vph)	282	5	0	218	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		20	0		0	25
Storage Lanes		1	0		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1583	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1863	1583	0	1863	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	1807			444	226	
Travel Time (s)	49.3			12.1	6.2	
Confl. Bikes (#/hr)		10				10
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	291	5	0	225	0	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	291	5	0	225	0	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	282	5	0	218	0	2
Future Vol, veh/h	282	5	0	218	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	20	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	291	5	0	225	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	291
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	748
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	748
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	748	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-
HCM Control Delay (s)	9.8	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	13	0	1076	1015	13
Future Volume (vph)	0	13	0	1076	1015	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			25
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.865			0.998	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3532	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3532	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	243			710	430	
Travel Time (s)	6.6			16.1	9.8	
Confl. Peds. (#/hr)		10				10
Confl. Bikes (#/hr)		11				11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	13	0	1109	1046	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	13	0	1109	1059	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	13	0	1076	1015	13
Future Vol, veh/h	0	13	0	1076	1015	13
Conflicting Peds, #/hr	0	10	0	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	0	1109	1046	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	550	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	479	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	470	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	470	-	-
HCM Lane V/C Ratio	-	0.029	-	-
HCM Control Delay (s)	-	12.9	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Appendix B-2: Existing Plus Project Scenario(s)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	198	103	165	929	941	71
Future Volume (vph)	198	103	165	929	941	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	60	0	200			0
Storage Lanes	1	1	1			0
Taper Length (ft)	75		75			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	1.00		1.00	
Frt		0.850			0.990	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3493	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1754	1551	1764	3539	3493	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		106			13	
Link Speed (mph)	25			30	30	
Link Distance (ft)	76			160	797	
Travel Time (s)	2.1			3.6	18.1	
Confl. Peds. (#/hr)	10	10	10			10
Confl. Bikes (#/hr)						11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	204	106	170	958	970	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	204	106	170	958	1043	0
Enter Blocked Intersection	Yes	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	26.7	26.7	9.7	26.7	26.7	
Total Split (s)	26.7	26.7	10.0	32.5	26.7	
Total Split (%)	42.1%	42.1%	15.8%	51.3%	42.1%	
Maximum Green (s)	22.0	22.0	5.3	27.8	22.0	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Max	C-Max	
Walk Time (s)					7.0	
Flash Dont Walk (s)					15.0	
Pedestrian Calls (#/hr)					10	
Act Effct Green (s)	12.6	12.6	13.0	41.4	23.7	
Actuated g/C Ratio	0.20	0.20	0.21	0.65	0.37	
v/c Ratio	0.58	0.27	0.47	0.41	0.79	
Control Delay	29.2	6.5	28.6	6.5	24.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	6.5	28.6	6.5	24.0	
LOS	C	A	C	A	C	
Approach Delay	21.4			9.8	24.0	
Approach LOS	C			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 63.4			
Actuated Cycle Length: 63.4			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.2		Intersection LOS: B	
Intersection Capacity Utilization 60.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: FREEDOM & ALTA VISTA

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	204	106	170	958	1043
v/c Ratio	0.58	0.27	0.47	0.41	0.79
Control Delay	29.2	6.5	28.6	6.5	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	6.5	28.6	6.5	24.0
Queue Length 50th (ft)	72	0	57	76	185
Queue Length 95th (ft)	118	31	#133	139	#298
Internal Link Dist (ft)	1			80	717
Turn Bay Length (ft)	60		200		
Base Capacity (vph)	614	607	363	2312	1313
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.17	0.47	0.41	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	198	103	165	929	941	71
Future Volume (veh/h)	198	103	165	929	941	71
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	204	106	170	958	970	73
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	273	243	150	2479	1799	135
Arrive On Green	0.15	0.15	0.08	0.70	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	3647	3433	251
Grp Volume(v), veh/h	204	106	170	958	516	527
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1814
Q Serve(g_s), s	6.9	3.8	5.3	7.0	11.9	11.9
Cycle Q Clear(g_c), s	6.9	3.8	5.3	7.0	11.9	11.9
Prop In Lane	1.00	1.00	1.00			0.14
Lane Grp Cap(c), veh/h	273	243	150	2479	957	977
V/C Ratio(X)	0.75	0.44	1.13	0.39	0.54	0.54
Avail Cap(c_a), veh/h	622	554	150	2479	957	977
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	24.2	28.9	3.9	9.4	9.4
Incr Delay (d2), s/veh	4.1	1.2	114.2	0.5	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.5	6.9	1.7	4.3	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.6	25.4	143.0	4.4	11.6	11.6
LnGrp LOS	C	C	F	A	B	B
Approach Vol, veh/h	310			1128	1043	
Approach Delay, s/veh	28.2			25.3	11.6	
Approach LOS	C			C	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		48.6		14.4	10.0	38.6
Change Period (Y+Rc), s		* 4.7		* 4.7	* 4.7	* 4.7
Max Green Setting (Gmax), s		* 28		* 22	* 5.3	* 22
Max Q Clear Time (g_c+I1), s		9.0		8.9	7.3	13.9
Green Ext Time (p_c), s		6.8		0.8	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	297	9	0	236	0	4
Future Volume (vph)	297	9	0	236	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		20	0		0	25
Storage Lanes		1	0		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	1863	1583	0	1863	0	1611
Flt Permitted						
Satd. Flow (perm)	1863	1583	0	1863	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	1807			444	226	
Travel Time (s)	49.3			12.1	6.2	
Confl. Bikes (#/hr)		10				10
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	306	9	0	243	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	306	9	0	243	0	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱		↑		↱
Traffic Vol, veh/h	297	9	0	236	0	4
Future Vol, veh/h	297	9	0	236	0	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	-	20	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	9	0	243	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	306
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	734
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	734
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	734	-	-	-
HCM Lane V/C Ratio	0.006	-	-	-
HCM Control Delay (s)	9.9	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	23	0	1094	1023	21
Future Volume (vph)	0	23	0	1094	1023	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			25
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	3529	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	3529	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	243			710	430	
Travel Time (s)	6.6			16.1	9.8	
Confl. Peds. (#/hr)		10				10
Confl. Bikes (#/hr)		11				11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	24	0	1128	1055	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	24	0	1128	1077	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	1094	1023	21
Future Vol, veh/h	0	23	0	1094	1023	21
Conflicting Peds, #/hr	0	10	0	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	0	1128	1055	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	559	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	472	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	463	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	463	-	-
HCM Lane V/C Ratio	-	0.051	-	-
HCM Control Delay (s)	-	13.2	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-