DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400, Modesto, CA 95354
Planning Phone: (209) 525-6330 Fax: (209) 525-5911
Building Phone: (209) 525-6557 Fax: (209) 525-7759

Re-Referral
Early Consultation

Date: **June 7, 2024**

To: **Distribution List (See Attachment A)**

From: **Kristen Anaya, Associate Planner**
Planning and Community Development

Subject: **REZONE APPLICATION NO. PLN2018-0022 – NUNES ROAD TRAVEL PLAZA**

Respond By: **June 24, 2024**

****PLEASE REVIEW REFERRAL PROCESS POLICY****

The Stanislaus County Department of Planning and Community Development is soliciting comments from responsible agencies under the Early Consultation process to determine: a) whether or not the project is subject to CEQA and b) if specific conditions should be placed upon project approval.

Therefore, please contact this office by the response date if you have any comments pertaining to the proposal. Comments made identifying potential impacts should be as specific as possible and should be based on supporting data (e.g., traffic counts, expected pollutant levels, etc.). Your comments should emphasize potential impacts in areas which your agency has expertise and/or jurisdictional responsibilities.

These comments will assist our Department in preparing a staff report to present to the Planning Commission. Those reports will contain our recommendations for approval or denial. They will also contain recommended conditions to be required should the project be approved. Therefore, please list any conditions that you wish to have included for presentation to the Commission as well as any other comments you may have. Please return all comments and/or conditions as soon as possible or no later than the response date referenced above.

Thank you for your cooperation. Please call (209) 525-6330 if you have any questions.

Applicant: **Herman Bhatti**

Project Location: **4924 Nunes Road, between North Golden State Boulevard and East Keyes Road, east of State Route 99, in the Community of Keyes.**

APN: **045-050-010**

Williamson Act Contract: **N/A**

General Plan: **Planned Development (P-D)**

Community Plan: **Highway Commercial**

Current Zoning: **General Agriculture (A-2-10)**

Project Description: **Request to rezone a 8.6± acre parcel from General Agriculture (A-2-10) to Planned Development (P-D), to allow for the development of various commercial uses for the traveling public. The applicant proposes to develop the site by constructing two 4,000± square-foot quick service restaurants with drive-thrus, a 4,800± square-foot fueling canopy with 16 fueling positions for passenger vehicles, an 1,800± square-foot diesel fueling canopy with four fueling positions for trucks, a 1,600± square-foot fuel storage building, a 2,200± square-foot truck wash, a 6,000± convenience store, and a 18,900± square-foot banquet hall. The project site is proposed to be paved with 399 parking stalls and will provide access via a reciprocal drive aisle accessing the**

adjoining parcel to the east, further identified by Assessor Parcel Number (APN) 045-052-027. No overnight or truck parking is proposed. Signage, consisting of a 100-foot-tall free-standing tenant sign is proposed; however, development standards will be applied to reduce the signage height in order to achieve consistency among the surrounding highway commercial developments in the area. The project site is located within the Keyes Community Plan, Keyes Municipal Advisory Council-adopted boundaries, and will be served by Keyes Community Service District for public water and sanitary sewer services.

The convenience store, both fueling canopies, and truck wash propose to operate 24 hours per-day, seven-days a week, year-round with a combined total of four employees on a minimum shift, and up to 13 employees on a maximum shift. Both quick-service restaurants are anticipated to operate daily from 10:00 a.m. to 10:00 p.m. with one employee each on a minimum shift, and up to five each on a maximum shift.

The banquet hall is proposed to have two separate event spaces for rent, a 10,000 and 6,000 square-foot area, respectively. A total of 30 employees are anticipated to be on-site during events, including security staff as needed. The daily hours of operation for the banquet hall will be 8:00 a.m. to 2:00 a.m., which includes any time needed to set up or take-down events; however, it is expected that bookings will primarily occur on weekends, and occasionally weekdays, with a maximum of ten events per month and a total of 1,000 attendees at any given time. The banquet hall will include a kitchen facility for on-site catering services and will have indoor amplified sound from a fixed sound system during events. No outdoor activities are proposed in conjunction with the event venue.

As an alternative use of the site upon development, the applicant is requesting to reserve the ability to convert the 6,000 square-foot convenience store to a grocery store, and the 2,200 square-foot truck wash building to a maintenance bay for truck repair.

Access is proposed to be taken via a driveway onto County-maintained North Golden State Boulevard, at a future four-way-stop intersection that will be installed in such a way to allow future signalized as traffic warrants. This was added as a requirement of development for Kamir Incorporated (Rezone No. PLN2018-0057), approved by the BOS on May 23, 2023 and located across from the project site, further identified as Assessor Parcel Number (APN) 045-050-007. A secondary point of access is proposed to be taken via County-maintained Nunes Road, via a proposed driveway aligned with the existing County-maintained Washington Road/Nunes Road intersection. These two points of access will be connected via an interior drive aisle, with the interior vehicle access set up in such a way as to provide reciprocal circulation and access to the parcel to the east, on APN 045-052-027 at such a time as it develops with a commercial use. Stormwater will be maintained on-site via an on-site proposed french drain system with percolation within the landscaped areas.

Development of the site is proposed to take place over five phases within ten years, with phase one consisting of the drive aisle and access improvements, phase two consisting of the quick-service restaurants with drive-thrus, phase three consisting of the convenience store and passenger vehicle fueling, phase four consisting of development of the truck wash and fueling, and phase five consisting of the banquet hall.

This project request's Early Consultation was initially referred to outside agencies for comment in 2018; however, the project has since been revised to modify the site layout and include a banquet hall in the proposed uses. As part of the previous referral, a Traffic Impact Analysis (TIA) was prepared jointly for the Nunes Road Travel Plaza project, the Kamir Incorporated project, and a third application that is currently under review, Rezone Application No. PLN2018-0078 for ITC Enterprises, located south of the project site on APN 045-050-008. In that TIA, the project-specific and cumulative traffic impacts were evaluated for the three projects, and several mitigation measures were identified that will be applied to this project, including payment of a fair-share fee contribution towards a Keyes Community Traffic Impact Mitigation fee program, road dedications, and road frontage and intersection improvements. Additionally, a Health Risk Assessment and

Noise Study were previously prepared for the project in response to the previous Early Consultation referral, which have been attached for reference. The respective agencies with regulatory oversight to review these respective documents will be consulted to determine if any revisions are needed to assess the potential impacts associated with the modified project.

Full document with attachments available for viewing at:
http://www.stancounty.com/planning/pl/act-projects.shtm

REZONE APPLICATION NO. PLN2018-0022 – NUNES ROAD TRAVEL PLAZA
Attachment A

Distribution List

X	CA DEPT OF CONSERVATION Land Resources		STAN CO ALUC
X	CA DEPT OF FISH & WILDLIFE		STAN CO ANIMAL SERVICES
	CA DEPT OF FORESTRY (CAL FIRE)	X	STAN CO BUILDING PERMITS DIVISION
X	CA DEPT OF TRANSPORTATION DIST 10	X	STAN CO CEO
X	CA OPR STATE CLEARINGHOUSE		STAN CO CSA
X	CA RWQCB CENTRAL VALLEY REGION	X	STAN CO DER
	CA STATE LANDS COMMISSION		STAN CO ERC
	CEMETERY DISTRICT	X	STAN CO FARM BUREAU
	CENTRAL VALLEY FLOOD PROTECTION	X	STAN CO HAZARDOUS MATERIALS
X	CITY OF: TURLOCK		STAN CO PARKS & RECREATION
X	COMMUNITY SERVICES DIST: KEYES	X	STAN CO PUBLIC WORKS
X	COOPERATIVE EXTENSION		STAN CO RISK MANAGEMENT
	COUNTY OF:	X	STAN CO SHERIFF
	DER - GROUNDWATER RESOURCES DIVISION	X	STAN CO SUPERVISOR DIST 5: C. CONDIT
X	FIRE PROTECTION DIST: KEYES	X	STAN COUNTY COUNSEL
X	GSA: TURLOCK SUBBASIN	X	StanCOG
	HOSPITAL DIST:	X	STANISLAUS FIRE PREVENTION BUREAU
X	IRRIGATION DIST: TURLOCK	X	STANISLAUS LAFCO
X	MOSQUITO DIST: TURLOCK		STATE OF CA SWRCB – DIV OF DRINKING WATER DIST. 10
X	STANISLAUS COUNTY EMERGENCY MEDICAL SERVICES		SURROUNDING LANDOWNERS
X	MUNICIPAL ADVISORY COUNCIL: KEYES		INTERESTED PARTIES
X	PACIFIC GAS & ELECTRIC	X	TELEPHONE COMPANY: AT&T
X	POSTMASTER: KEYES		TRIBAL CONTACTS (CA Government Code §65352.3)
X	RAILROAD: UNION PACIFIC		US ARMY CORPS OF ENGINEERS
X	SAN JOAQUIN VALLEY APCD	X	US FISH & WILDLIFE
X	SCHOOL DIST 1: KEYES UNION		US MILITARY (SB 1462)
X	SCHOOL DIST 2: TURLOCK JOINT UNIFIED HIGH		USDA NRCS
	WORKFORCE DEVELOPMENT		WATER DIST:
X	STAN CO AG COMMISSIONER		

STANISLAUS COUNTY
CEQA REFERRAL RESPONSE FORM

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

FROM: _____

SUBJECT: **REZONE APPLICATION NO. PLN2018-0022 – NUNES ROAD TRAVEL PLAZA**

Based on this agency's particular field(s) of expertise, it is our position the above described project:

_____ Will not have a significant effect on the environment.
_____ May have a significant effect on the environment.
_____ No Comments.

Listed below are specific impacts which support our determination (e.g., traffic general, carrying capacity, soil types, air quality, etc.) – (attach additional sheet if necessary)

1.
2.
3.
4.

Listed below are possible mitigation measures for the above-listed impacts: *PLEASE BE SURE TO INCLUDE WHEN THE MITIGATION OR CONDITION NEEDS TO BE IMPLEMENTED (PRIOR TO RECORDING A MAP, PRIOR TO ISSUANCE OF A BUILDING PERMIT, ETC.):*

1.
2.
3.
4.

In addition, our agency has the following comments (attach additional sheets if necessary).

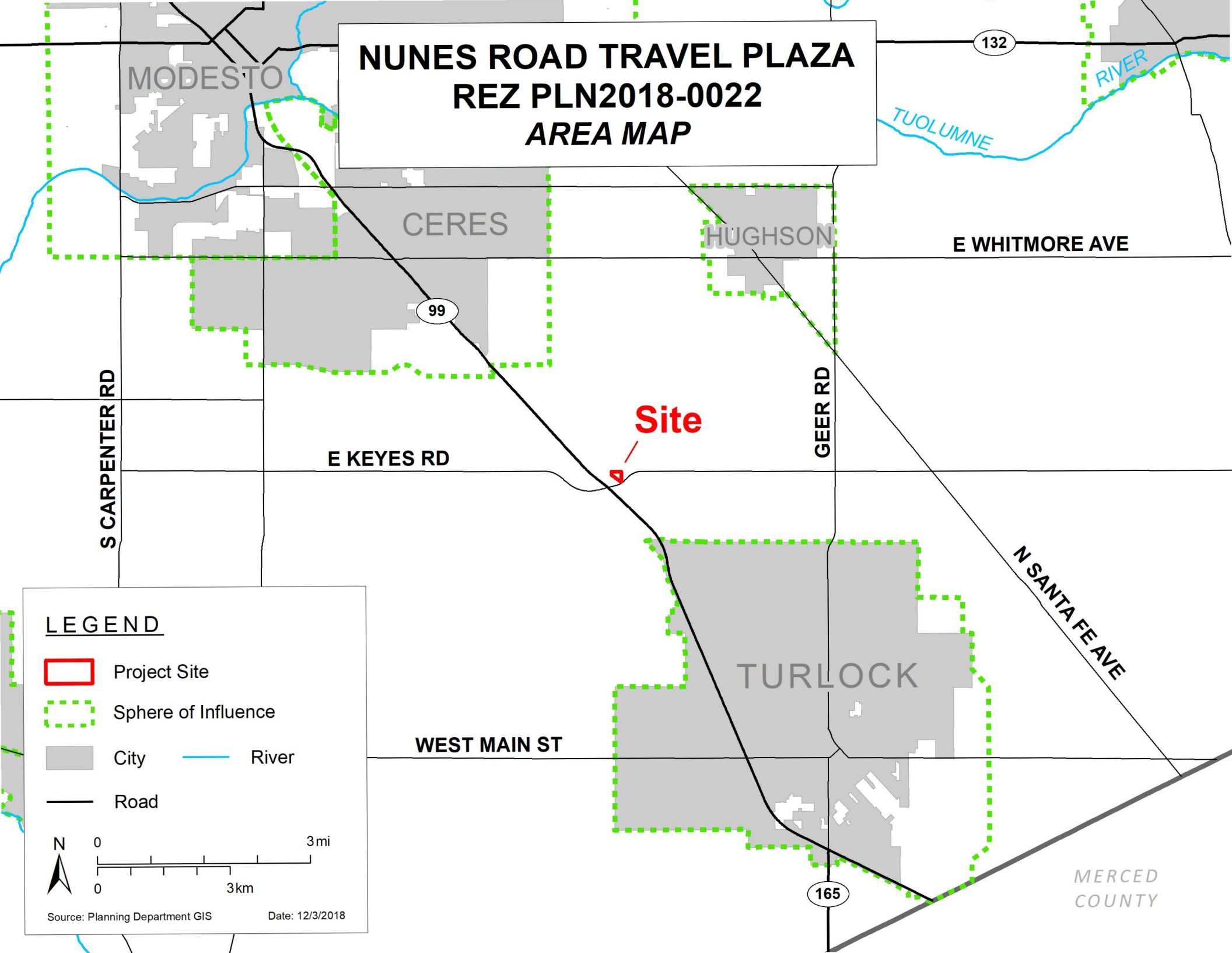
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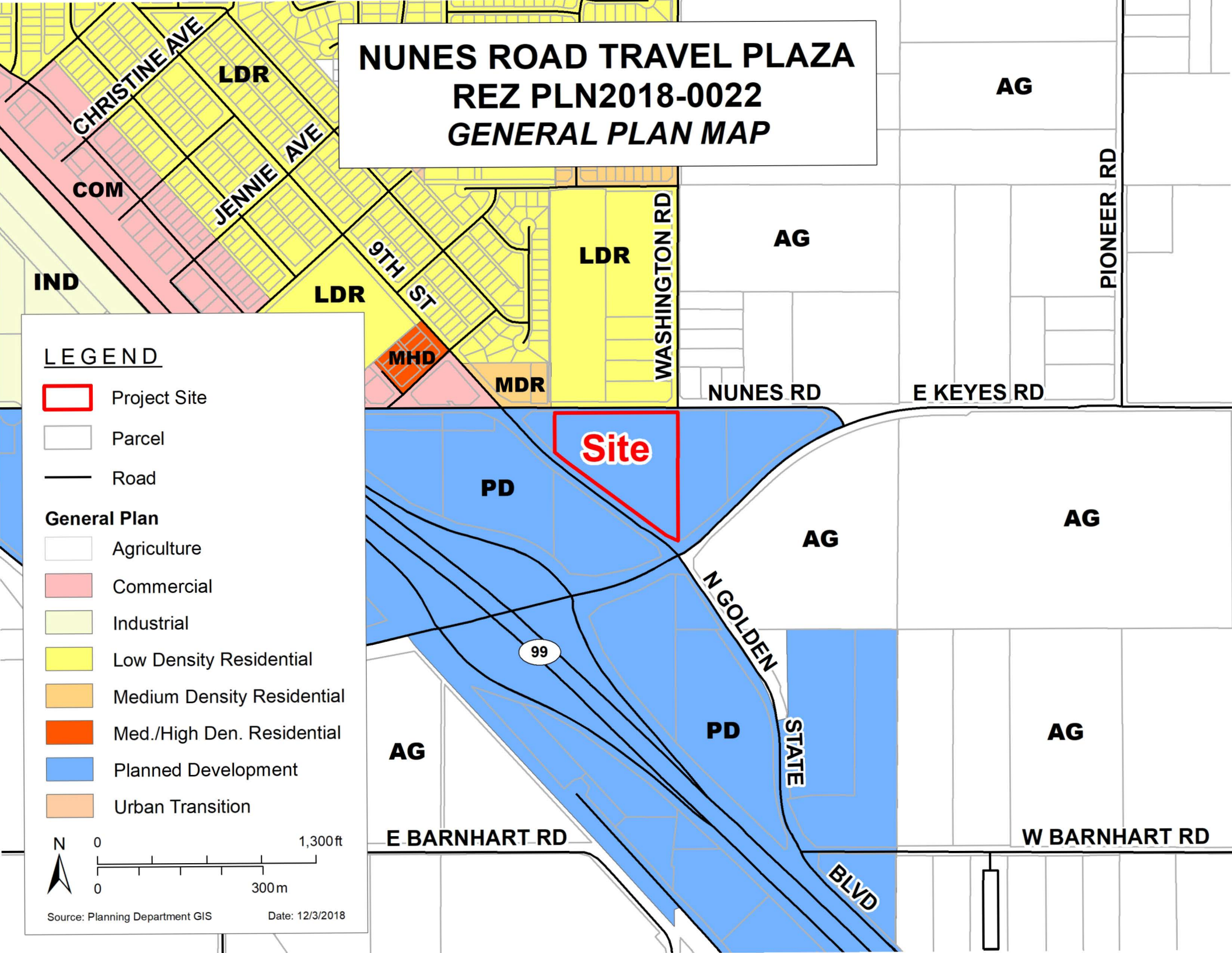
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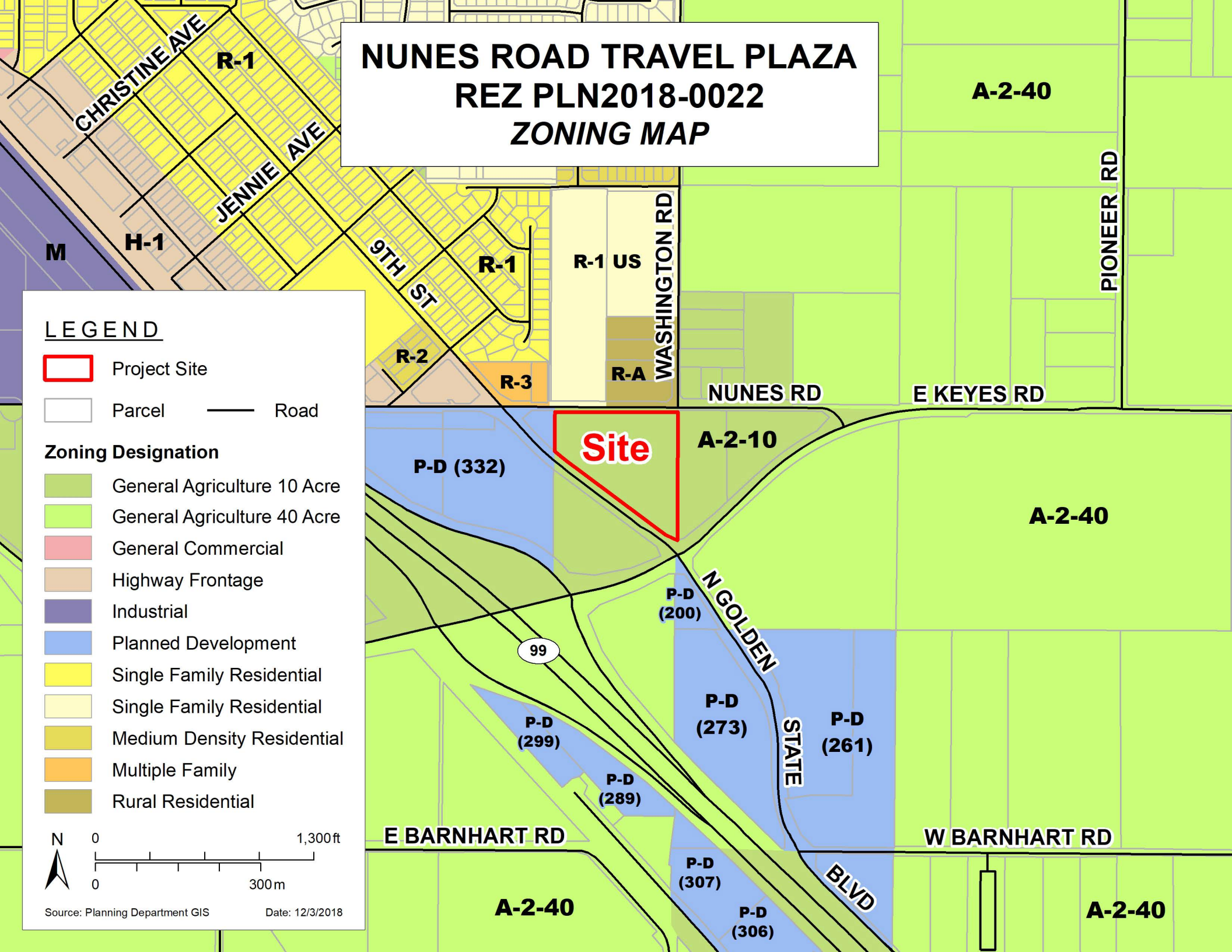
Response prepared by:

_____

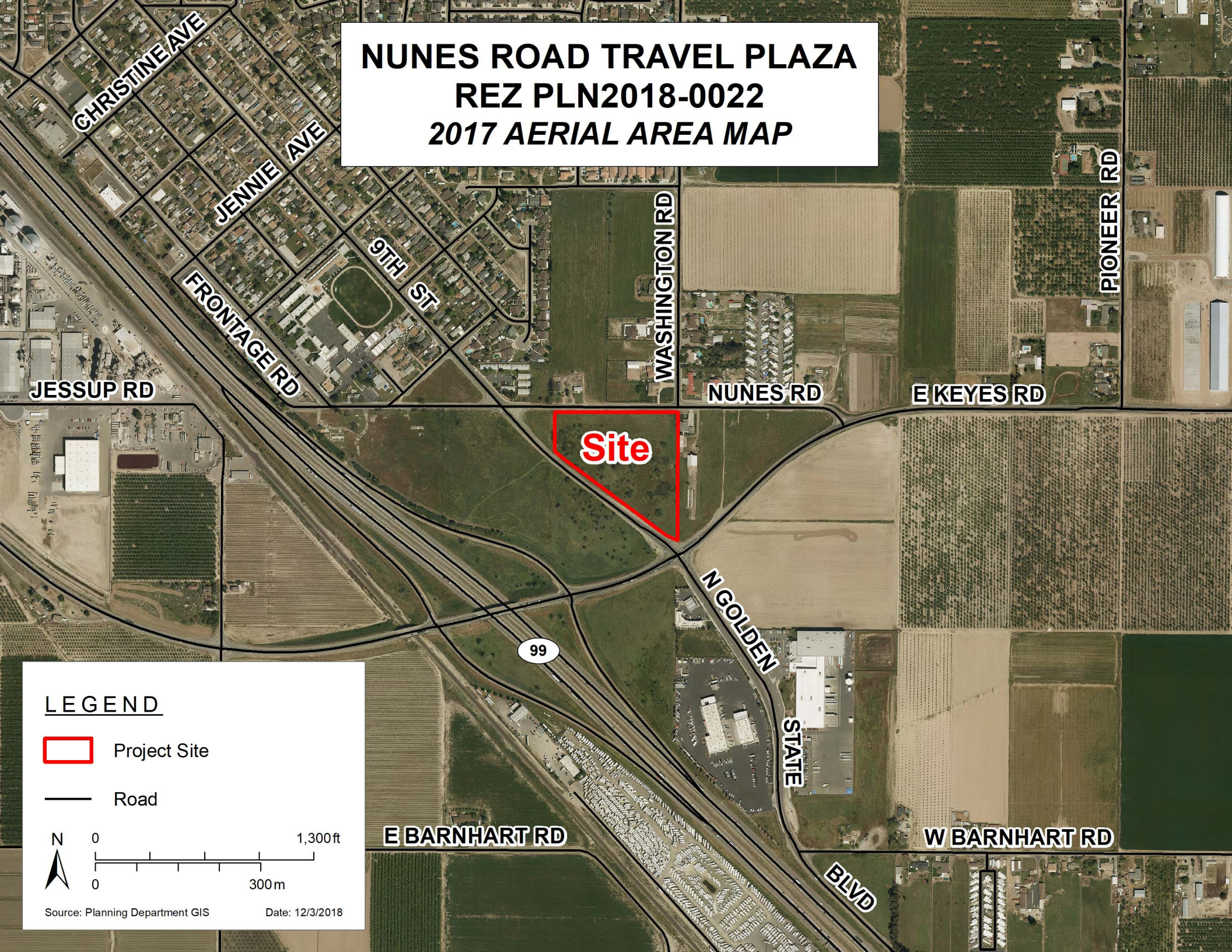
Name Title Date


NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
AREA MAP
MODESTO
CERES
HUGHSON
TURLOCK
MERCED COUNTY
TUOLUMNE RIVER
132
99
165
E WHITMORE AVE
E KEYES RD
WEST MAIN ST
S CARPENTER RD
GEER RD
N SANTA FE AVE
Site
LEGEND
Project Site
Sphere of Influence
City
River
Road
N
0
3mi
0
3km
Source: Planning Department GIS
Date: 12/3/2018

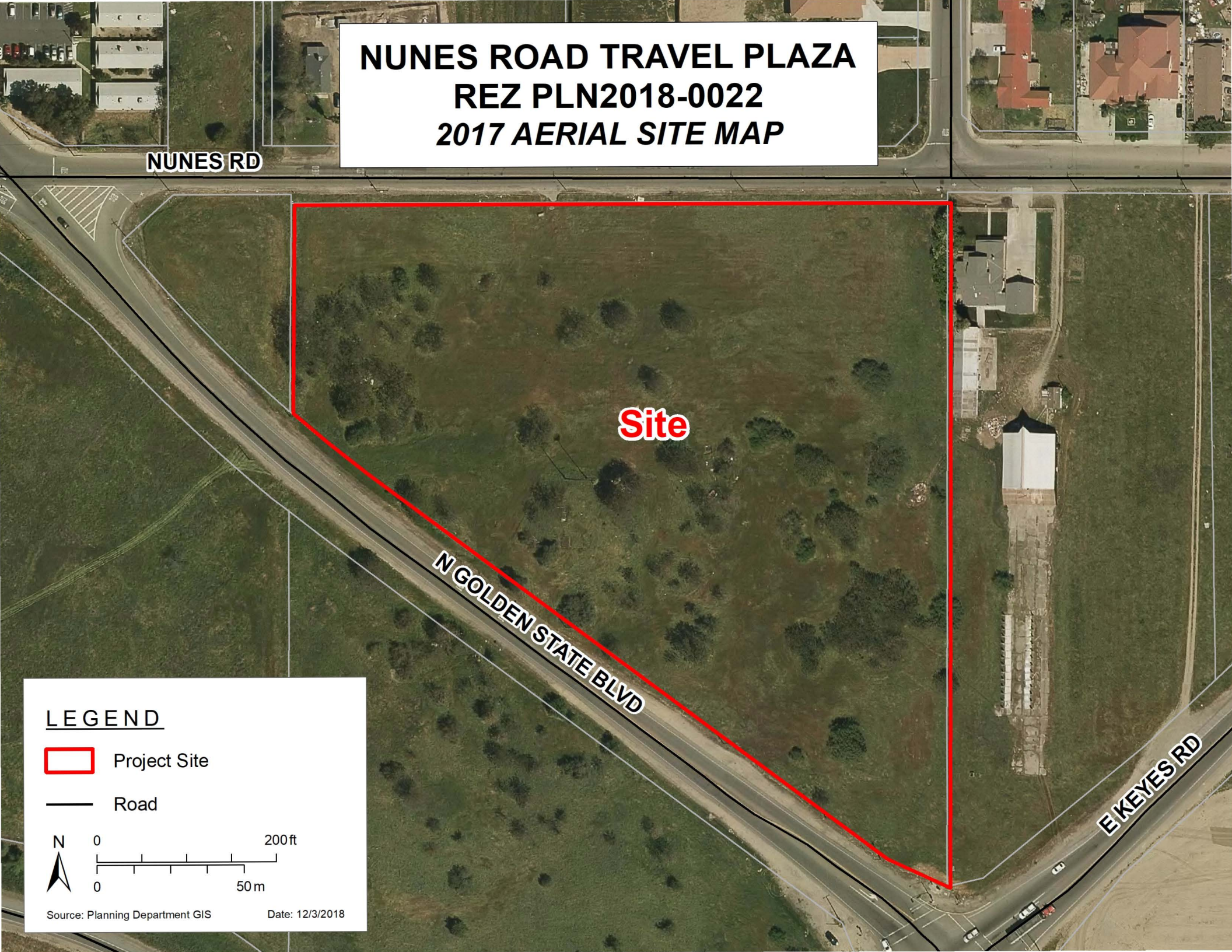

NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
GENERAL PLAN MAP
CHRISTINE AVE
JENNIE AVE
9TH ST
WASHINGTON RD
PIONEER RD
NUNES RD
E KEYES RD
N GOLDEN STATE BLVD
E BARNHART RD
W BARNHART RD
99
LDR
COM
IND
MHD
MDR
AG
PD
Site
LEGEND
Project Site
Parcel
Road
General Plan
Agriculture
Commercial
Industrial
Low Density Residential
Medium Density Residential
Med./High Den. Residential
Planned Development
Urban Transition
N
0
1,300 ft
0
300 m
Source: Planning Department GIS
Date: 12/3/2018


NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
ZONING MAP
LEGEND
Project Site
Parcel
Road
Zoning Designation
General Agriculture 10 Acre
General Agriculture 40 Acre
General Commercial
Highway Frontage
Industrial
Planned Development
Single Family Residential
Single Family Residential
Medium Density Residential
Multiple Family
Rural Residential
N
0
1,300 ft
0
300 m
Source: Planning Department GIS
Date: 12/3/2018
CHRISTINE AVE
JENNIE AVE
9TH ST
WASHINGTON RD
PIONEER RD
NUNES RD
E KEYES RD
N GOLDEN STATE BLVD
E BARNHART RD
W BARNHART RD
99
Site
R-1
H-1
M
R-1 US
R-A
R-2
R-3
A-2-40
A-2-10
P-D (332)
P-D (200)
P-D (273)
P-D (261)
P-D (299)
P-D (289)
P-D (307)
P-D (306)

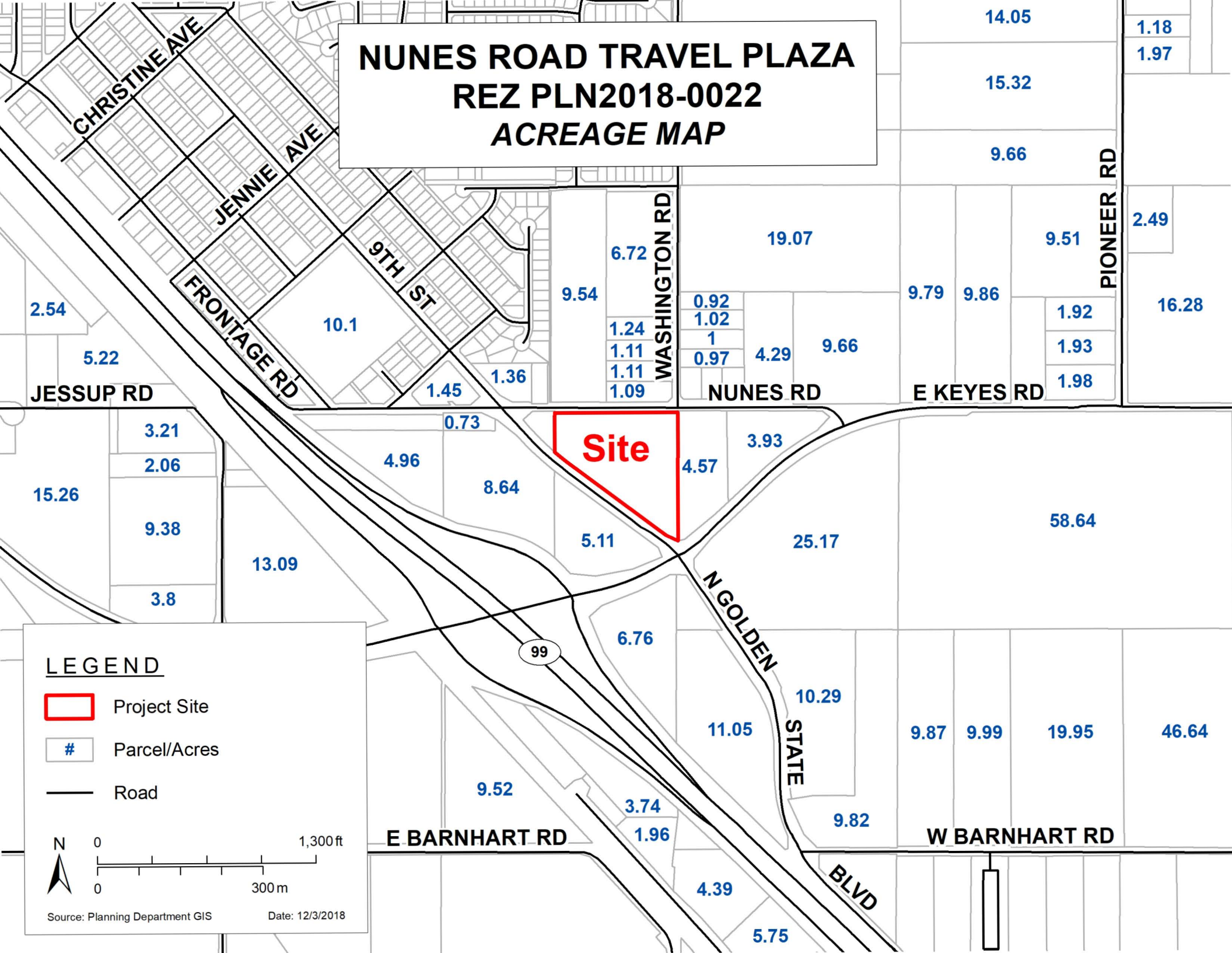
NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
2017 AERIAL AREA MAP



NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
2017 AERIAL SITE MAP



NUNES ROAD TRAVEL PLAZA
REZ PLN2018-0022
ACREAGE MAP

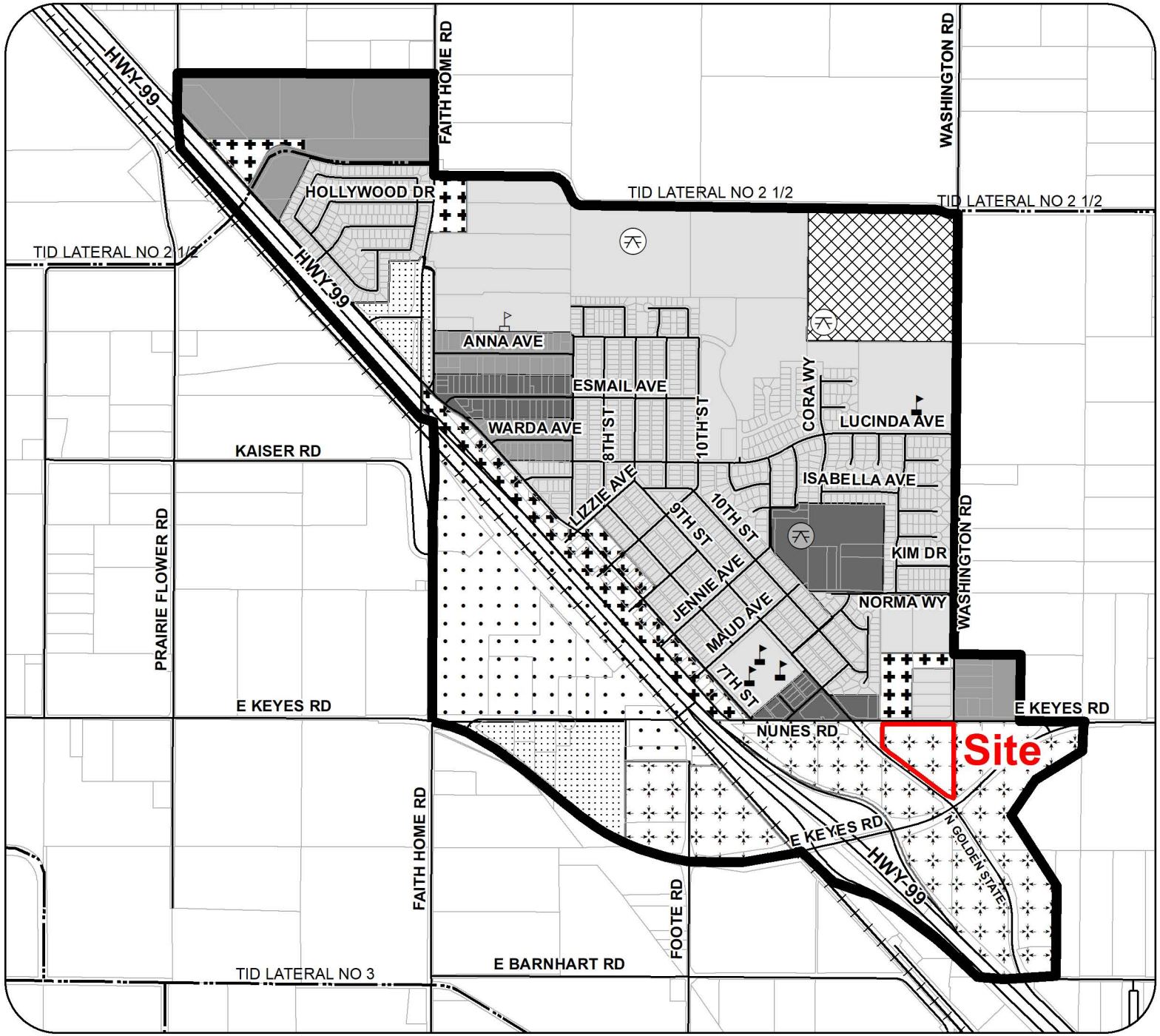


LEGEND

- Project Site
- # Parcel/Acres
- Road

N 0 1,300 ft
0 300 m

Source: Planning Department GIS Date: 12/3/2018



Keyes
COMMUNITY PLAN

Land Use Designations:

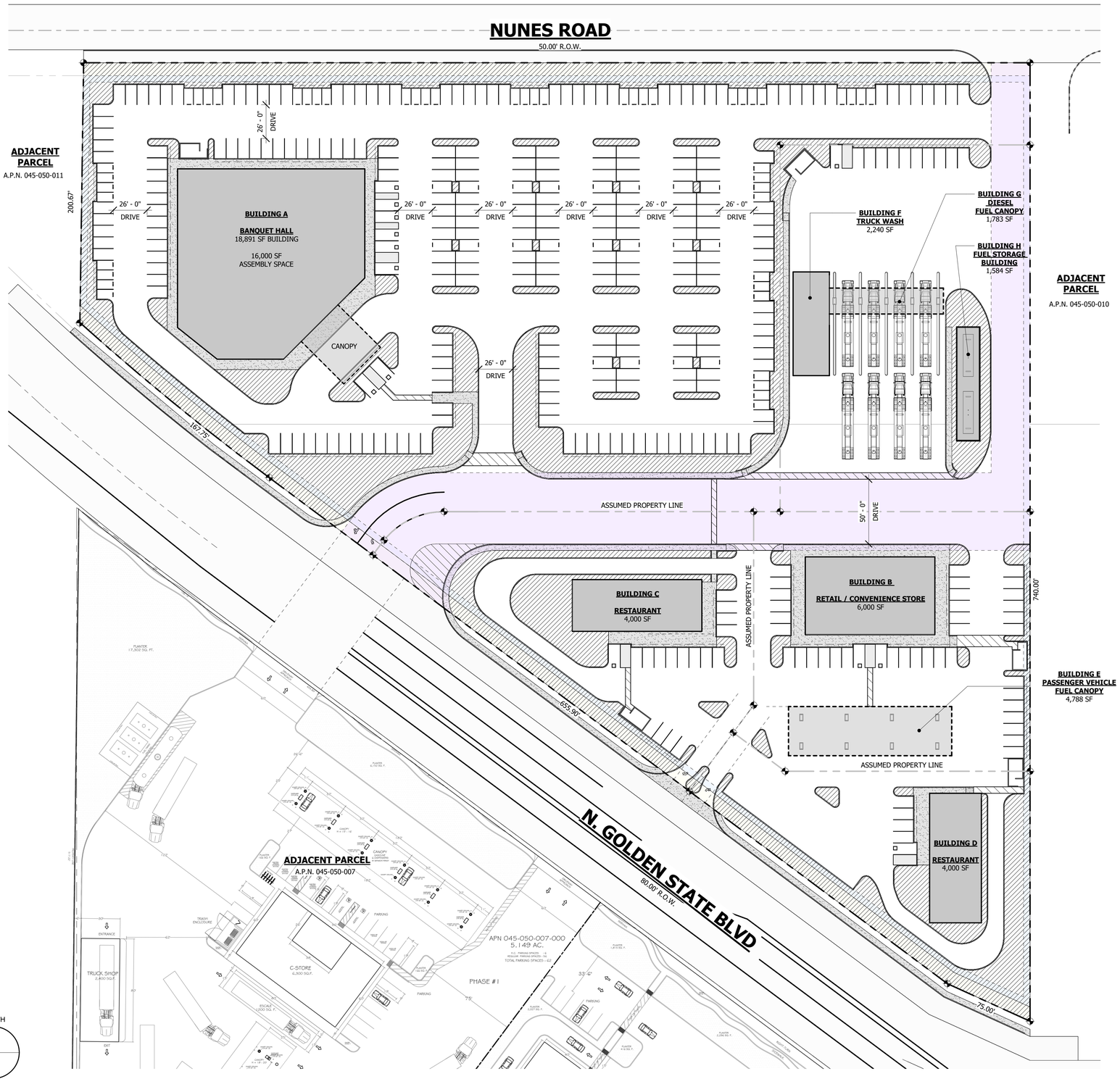
- Commercial
- Commercial - Highway
- Industrial
- Planned Industrial
- Residential - Low
- Residential - Medium
- Residential - Medium-High
- Urban Transition

Parks and Schools:

- Existing Park
- Proposed Park
- Existing School
- Proposed School

N
W E
S

0 500 1,000 2,000
Feet



1 SITE PLAN

SCALE: 1" = 40'-0"

SITE AREA TABULATIONS

DESCRIPTION	AREA	% OF TOTAL
ASPHALT PAVING	237002 SF	67%
BUILDING A-- BANQUET HALL	18891 SF	5%
BUILDING B -- CONVENIENCE STORE	6000 SF	2%
BUILDING C -- QUICK SERVE RESTAURANT	4000 SF	1%
BUILDING D -- QUICK SERVE RESTAURANT #2	4000 SF	1%
BUILDING E -- TRUCK WASH	2240 SF	1%
BUILDING H -- FUEL STORAGE BUILDING	1584 SF	0%
EXTERIOR CONCRETE WALK	16373 SF	5%
LANDSCAPE PLANTER	64245 SF	18%
	354335 SF	100%

REQUIRED PARKING

NUMBER	USE	AREA	PARKING RATIO	PARKING REQUIRED
BANQUET HALL				
A	BANQUET HALL	16000 SF	50 SF	320.00
		16000 SF		320.00
RESTAURANT / RETAIL				
B	RETAIL / CONVENIENCE STORE	6000 SF	300 SF	20.00
C	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
D	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
E	PASSENGER CAR FUEL CANOPY	4788 SF	0 SF	
		18788 SF		73.33
TRUCK WASH				
F	TRUCK WASH BUILDING	2240 SF	300 SF	7.47
G	DIESEL TRUCK FUEL CANOPY	1841 SF	0 SF	
H	FUEL TANK STORAGE BUILDING	1584 SF	0 SF	
		5665 SF		7.47
TOTAL:		40453 SF		400.80

PARKING PROVIDED

MARK	DESCRIPTION	COUNT
BANQUET HALL		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	8
PRK-1	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 18'-0" L	96
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	153
PRK-3	COMPACT PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-0" L	20
PRK-4	COMPACT PARKING STALL -- SINGLE LINE STRIPE 7 '-6" W x 15'-0" L	50
		327
RESTAURANT / RETAIL		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	4
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	57
		61
TRUCK WASH		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	1
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	10
		11
TOTAL:		399

#	REVISION	BY

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www.commercialarch.com
ph. 209.571.8158

NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

LOCATION
4924 NUNES ROAD
KEYES, CA
95382

PARCEL
045-050-010

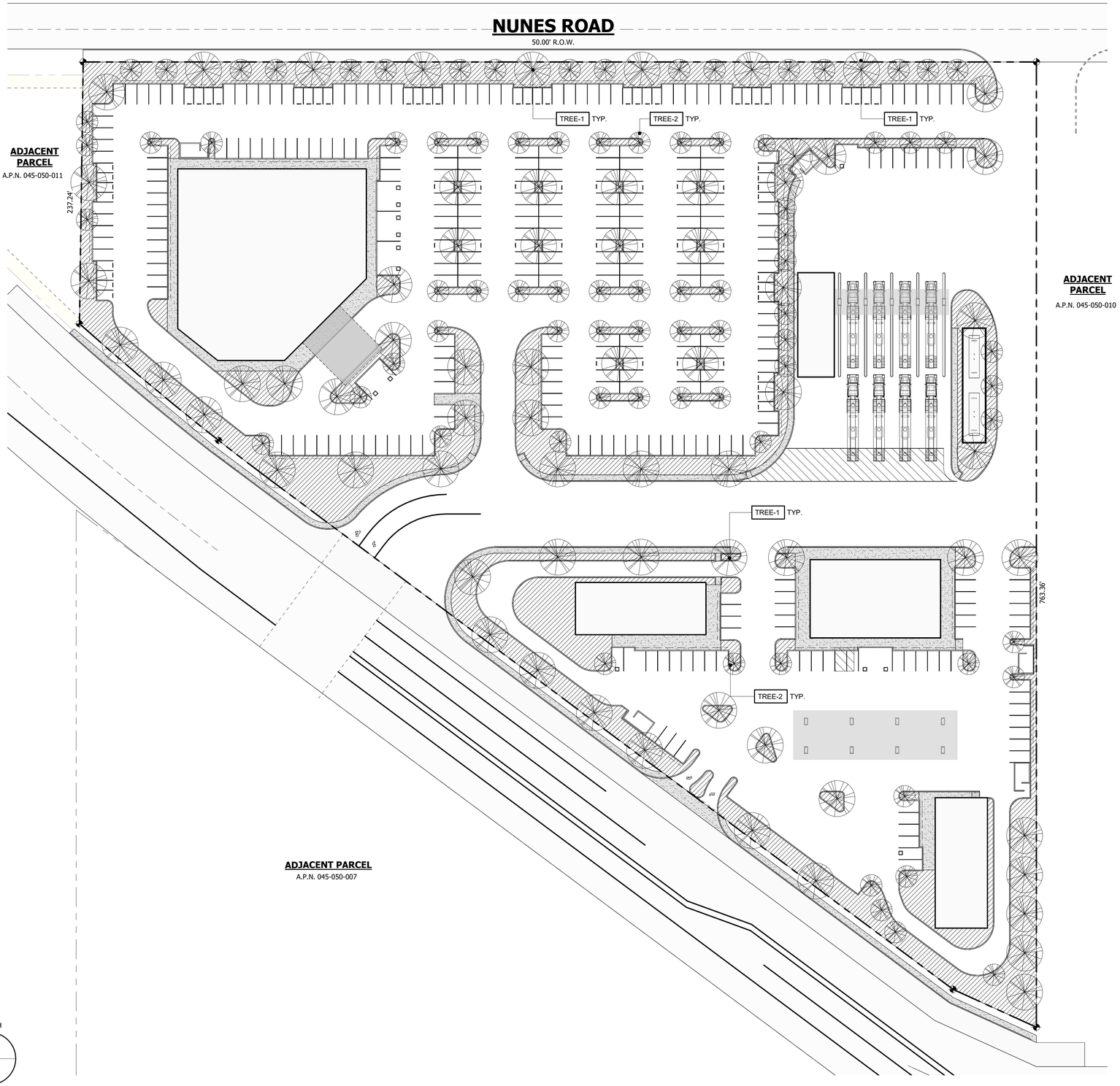
OWNER
KHDH RE HOLDINGS, LLC
-

BUILDING PERMIT NUMBER

DATE
4/11/2024 10:52:16 AM
COMMARCH #
23-186

P-A-1.0

PLANNING -- SITE PLAN



TREE PLANTING SCHEDULE

MARK	DESCRIPTION	QUANTITY
TREE-1	15 GALLON, CHINESE ELM TREE (OR SIMILAR)	67
TREE-2	<varies>	81
		148

1 SITE PLAN -- PRELIMINARY TREE PLANTING PLAN — SCALE: 1" = 40'-0"

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NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

LOCATION
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KEYES, CA
95382

PARCEL
045-050-010

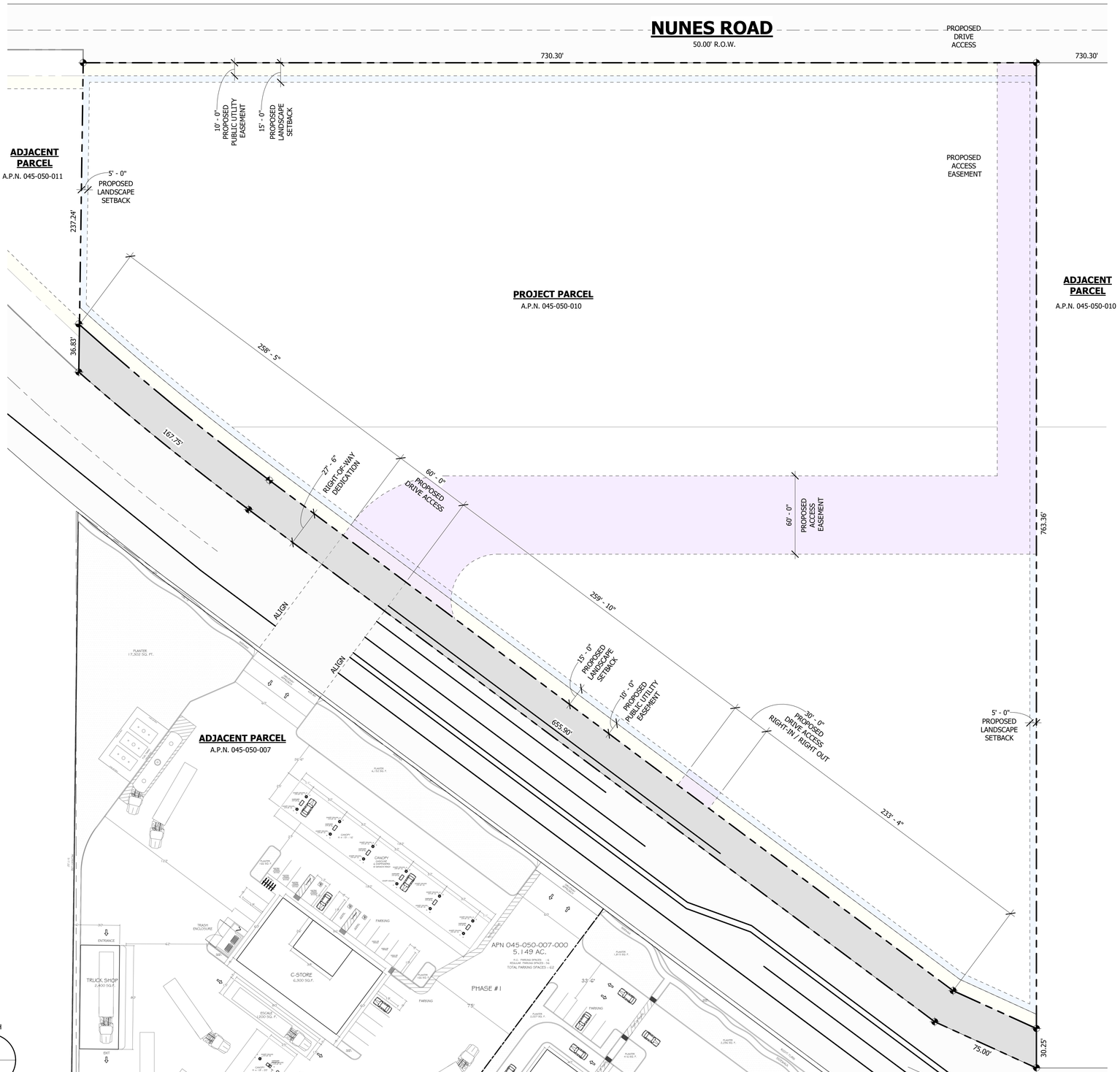
OWNER
KHDH RE HOLDINGS, LLC
-

BUILDING PERMIT NUMBER

DATE
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COMMARCH #
23-186

P-A-2.0

PLANNING -- TREE PLANTING PLAN



1 SITE PLAN -- EXISTING CONDITIONS & PROPOSED EASMENTS

SCALE: 1" = 40'-0"

SITE PLAN SYMBOL LEGEND

SITE SYMBOLS

- PROPERTY CORNER DATUM
- POINT OF CONNECTION

UTILITY SYMBOLS

- SANITARY SEWER CLEANOUT
- DOMESTIC WATER METER / SHUT-OFF
- DOMESTIC WATER BACKFLOW
- NATRUAL GAS METER

SITE FEATURES

- PROPERTY LINE
- PUBLIC UTILITY EASEMENT
- PRIVATE UTILITY EASEMENT
- ACCESS EASEMENT
- BUILDING SETBACK
- LANDSCAPE SETBACK

UTILITIES

- EXISTING SANITARY SEWER — x" Ø SS (E)
- SANITARY SEWER — x" Ø SS
- EXISTING GREASE WASTE — x" Ø GW (E)
- GREASE WASTE PIPING — x" Ø GW
- EXISTING DOMESTIC WATER — x" Ø CW (E)
- DOMESTIC WATER — x" Ø CW
- EXISTING NATURAL GAS — x" Ø NG (E)
- NATURAL GAS — x" Ø NG
- EXISTING UNDERGROUND ELECTRICAL CONDUIT — x" Ø EC (E)
- UNDERGROUND ELECTRICAL CONDUIT — x" Ø EC
- EXISTING OVERHEAD ELECTRICAL
- OVERHEAD ELECTRICAL

MATERIALS & GROUND COVER

- EXISTING ASPHALT PAVING - TO REMAIN
- EXISTING ASPHALT PAVING - TO BE DEMOLISHED
- ASPHALT PAVING
- EXISTING CONCRETE PAVING - TO REMAIN
- EXISTING CONCRETE PAVING - TO BE DEMOLISHED
- CONCRETE PAVING
- EXISTING LANDSCAPING - TO REMAIN
- EXISTING LANDSCAPING - TO BE DEMOLISHED
- LANSCAPING

WALLS & FENCING

- CONCRETE MASONRY WALL
- WOOD FENCE
- CHAIN LINK FENCE
- ORNAMENTAL IRON FENCE

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NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

LOCATION
4924 NUNES ROAD
KEYES, CA
95382

PARCEL
045-050-010

OWNER
KHDH RE HOLDINGS, LLC
-

BUILDING PERMIT NUMBER

DATE
4/11/2024 10:52:31 AM
COMMARCH #
23-186

P-D-1.0

PLANNING -- SITE PLAN -- EXISTING CONDITIONS AND DEMOLITION

NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

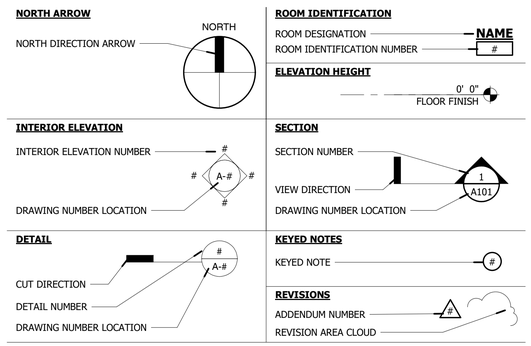
4924 NUNES ROAD

KEYES, CA

95382

045-050-010

ARCHITECTURAL SYMBOL LEGEND



PROJECT TEAM

PROPERTY OWNER
KHDH RE HOLDINGS, LLC
HERMAN BHATTI
3881 BOUGAINVILLEA DRIVE
CERES, CA 95307
PH. (209) 484-4651
EMAL HERMAN@GNNREALTORS.COM

ARCHITECT
COMMERCIALARCH
STACEY WELLNITZ
616 14TH STREET
MODESTO, CA 95354
PH. (209) 571-8158
EMAIL SWELLNITZ@COMMERCIALARCH.COM

DRAWING INDEX

GENERAL
P-G-1.0 PLANNING -- COVER SHEET

DEMOLITION
P-D-1.0 PLANNING -- SITE PLAN -- EXISTING CONDITIONS AND DEMOLITION

ARCHITECTURAL
P-A-1.0 PLANNING -- SITE PLAN
P-A-2.0 PLANNING -- TREE PLANTING PLAN

DEVELOPMENT DATA

ASSESSOR'S PARCEL NUMBER:	045-050-010		
PROJECT ADDRESS:	4924 NUNES ROAD KEYES, CA 95382		
PROJECT JURISDICTION:	BUILDING: FIRE:	STANISLAUS COUNTY STANISLAUS COUNTY	
	SEWER DISTRICT: WATER DISTRICT:	STANISLAUS COUNTY STANISLAUS COUNTY	
GENERAL PLAN:	GENERAL AG 10 ACRE		
ZONING	EXISTING PROPOSED	GENERAL AG 10 ACRE PD - PLANNED DEVELOPMENT (COMMERCIAL)	
SITE AREA:	8.60 ACRES	378,483 SF	ORIGINAL SITE AREA
	0.47 ACRES	20,473 SF	DEDICATION
	8.13 ACRES	354,335 SF	NEW SITE AREA AREA

REQUIRED PARKING

NUMBER	USE	AREA	PARKING RATIO	PARKING REQUIRED
BANQUET HALL				
A	BANQUET HALL	16000 SF	50 SF	320.00
		16000 SF		320.00
RESTAURANT / RETAIL				
B	RETAIL / CONVENIENCE STORE	6000 SF	300 SF	20.00
C	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
D	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
E	PASSENGER CAR FUEL CANOPY	4788 SF	0 SF	
		18788 SF		73.33
TRUCK WASH				
F	TRUCK WASH BUILDING	2240 SF	300 SF	7.47
G	DIESEL TRUCK FUEL CANOPY	1841 SF	0 SF	
H	FUEL TANK STORAGE BUILDING	1584 SF	0 SF	
		5665 SF		7.47
TOTAL:		40453 SF		400.80

BUILDING AREA, USE & OCCUPANCY

NUMBER	USE	OCCUPANCY	STORIES	CONSTR. TYPE	ALLOWABLE AREA	ACTUAL AREA
A	BANQUET HALL	A-2	1	VB SPRINKLED	24,000 SF	16000 SF
B	RETAIL / CONVENIENCE STORE	M	1	VB SPRINKLED	36,000 SF	6000 SF
C	QUICK SERVE RESTAURANT	A-2	1	VB SPRINKLED	24,000 SF	4000 SF
D	QUICK SERVE RESTAURANT	A-2	1	VB SPRINKLED	24,000 SF	4000 SF
E	PASSENGER CAR FUEL CANOPY	U	1	VB NON-SPRINKLED	5,000 SF	4788 SF
F	TRUCK WASH BUILDING	B	1	VB SPRINKLED	36,000 SF	2240 SF
G	DIESEL TRUCK FUEL CANOPY	U	1	VB NON-SPRINKLED	5,000 SF	1841 SF
H	FUEL TANK STORAGE BUILDING	U	1	VB NON-SPRINKLED	5,000 SF	1584 SF
TOTAL:						40453 SF

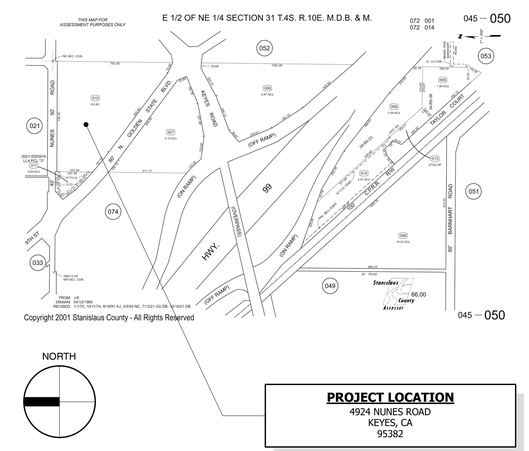
PARKING PROVIDED

MARK	DESCRIPTION	COUNT
BANQUET HALL		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	8
PRK-1	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 18'-0" L	96
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	153
PRK-3	COMPACT PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-0" L	20
PRK-4	COMPACT PARKING STALL -- SINGLE LINE STRIPE 7 '-6" W x 15'-0" L	50
		327
RESTAURANT / RETAIL		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	4
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	57
		61
TRUCK WASH		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	1
PRK-2	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 15'-6" L w/ 2'-6" OVERHANG	10
		11
TOTAL:		399

SITE AREA TABULATIONS

DESCRIPTION	AREA	% OF TOTAL
ASPHALT PAVING	237002 SF	67%
BUILDING A-- BANQUET HALL	18891 SF	5%
BUILDING B -- CONVENIENCE STORE	6000 SF	2%
BUILDING C -- QUICK SERVE RESTAURANT	4000 SF	1%
BUILDING D -- QUICK SERVE RESTAURANT #2	4000 SF	1%
BUILDING E -- TRUCK WASH	2240 SF	1%
BUILDING H -- FUEL STORAGE BUILDING	1584 SF	0%
EXTERIOR CONCRETE WALK	16373 SF	5%
LANDSCAPE PLANTER	64245 SF	18%
	354335 SF	100%

VICINITY MAP



#	REVISION	BY

commercialarch
architecture + planning + interiors
616 fourteenth street
modesto • california • 95354
www.commercialarch.com
ph. 209.571.8158

NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

LOCATION
4924 NUNES ROAD
KEYES, CA
95382

PARCEL
045-050-010

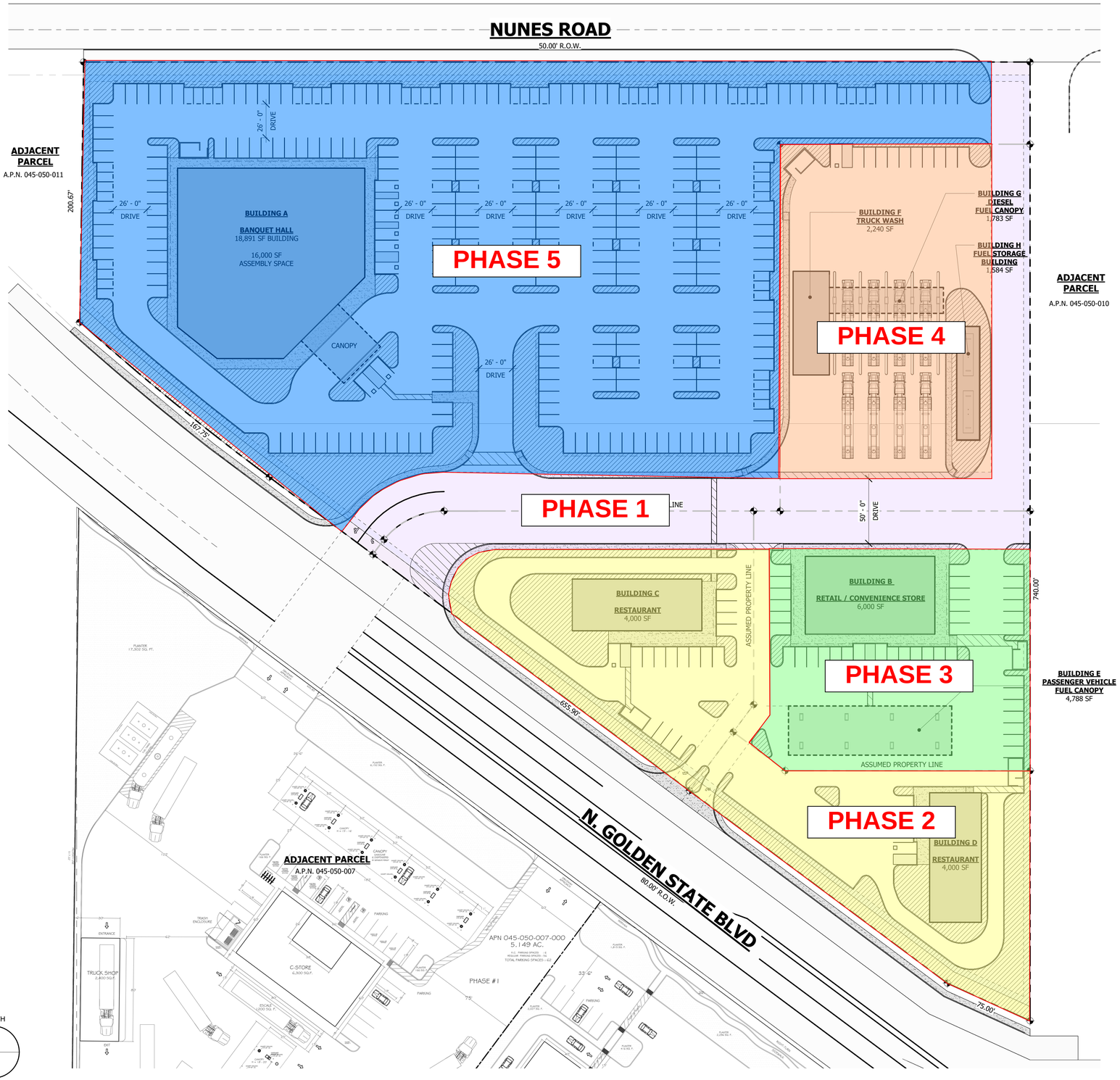
OWNER
KHDH RE HOLDINGS, LLC
-

BUILDING PERMIT NUMBER

DATE
4/11/2024 10:52:32 AM
COMMARCH #
23-186

P-G-1.0

PLANNING -- COVER SHEET



1 SITE PLAN

SCALE: 1" = 40'-0"

SITE AREA TABULATIONS

DESCRIPTION	AREA	% OF TOTAL
ASPHALT PAVING	237002 SF	67%
BUILDING A-- BANQUET HALL	18891 SF	5%
BUILDING B -- CONVENIENCE STORE	6000 SF	2%
BUILDING C -- QUICK SERVE RESTAURANT	4000 SF	1%
BUILDING D -- QUICK SERVE RESTAURANT #2	4000 SF	1%
BUILDING E -- TRUCK WASH	2240 SF	1%
BUILDING H -- FUEL STORAGE BUILDING	1584 SF	0%
EXTERIOR CONCRETE WALK	16373 SF	5%
LANDSCAPE PLANTER	64245 SF	18%
	354335 SF	100%

REQUIRED PARKING

NUMBER	USE	AREA	PARKING RATIO	PARKING REQUIRED
BANQUET HALL				
A	BANQUET HALL	16000 SF	50 SF	320.00
		16000 SF		320.00
RESTAURANT / RETAIL				
B	RETAIL / CONVENIENCE STORE	6000 SF	300 SF	20.00
C	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
D	QUICK SERVE RESTAURANT	4000 SF	150 SF	26.67
E	PASSENGER CAR FUEL CANOPY	4788 SF	0 SF	
		18788 SF		73.33
TRUCK WASH				
F	TRUCK WASH BUILDING	2240 SF	300 SF	7.47
G	DIESEL TRUCK FUEL CANOPY	1841 SF	0 SF	
H	FUEL TANK STORAGE BUILDING	1584 SF	0 SF	
		5665 SF		7.47
TOTAL:		40453 SF		400.80

PARKING PROVIDED

MARK	DESCRIPTION	COUNT
BANQUET HALL		
ADA-1	VAN ACCESSIBLE PARKING STALL -- 8'-0" CLEAR SPACE	8
PRK-1	STANDARD PARKING STALL -- SINGLE LINE STRIPE 9'-0" W x 18'-0" L	96
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PRK-4	COMPACT PARKING STALL -- SINGLE LINE STRIPE 7 '-6" W x 15'-0" L	50
		327
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		11
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NUNES ROAD REZONE

SITE REZONE & DEVELOPMENT APPLICATION

LOCATION
4924 NUNES ROAD
KEYES, CA
95382

PARCEL
045-050-010

OWNER
KHDH RE HOLDINGS, LLC
-

BUILDING PERMIT NUMBER

DATE
4/11/2024 10:52:16 AM
COMMARCH #
23-186

P-A-1.0

PLANNING -- SITE PLAN

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400, Modesto, CA 95354
Planning Phone: (209) 525-6330 Fax: (209) 525-5911
Building Phone: (209) 525-6557 Fax: (209) 525-7759
Form Available Online: www.stancounty.com/planning/applications.shtm

APPLICATION INFORMATION

HOW DO I APPLY?
Complete and submit this application/questionnaire form to the Stanislaus County Department of Planning & Community Development. Copies of this application may be obtained in person or on-line at our website, www.stancounty.com You are urged to meet and discuss your application with Planning staff. Pre-application meetings are not required, but are highly recommended.

HOW LONG WILL IT TAKE, FROM THE TIME A COMPLETE APPLICATION HAS BEEN RECEIVED?
The time to process an application will take about 90-120 days due to requirements of State law regarding public hearing notification, compliance with environmental laws, and time to write a staff report. Processing times will vary depending on the type of project, agency comments received during the early consultation period, and any studies which may be required to address agency comments. General Plan Amendment requests may take 6–9 months due to the number of times during the year the general plan can be amended.

HOW MUCH WILL IT COST?
Application fee: Reference Fee Schedule on pages 14 – 16

Fees may be paid by check, cash or credit card. Projects requiring an EIR be prepared will be subject to additional fees.

WHO APPROVES THE APPLICATION?
The Stanislaus County Planning Commission or Board of Supervisors will either approve or deny the application at an advertised public hearing.

BUILDING AND OTHER PERMITS?
After approval of your application, you may need to obtain a building permit, encroachment permit or other permit from the County and may also be required to obtain Federal or State permits from agencies such as the California Department of Fish and Wildlife, Regional Water Quality Control Board or US Army Corps of Engineers. Staff can assist you in identifying these permits.

WHAT INFORMATION WILL I NEED TO PROVIDE?
A complete application/questionnaire form including all applicable information listed on the Checklist on pages i–v.

Additional information may be required in order to complete the environmental review process. See Checklists and Notifications below.

APPLICATION CHECKLIST

All Applications: **☒ = Information Included**

☒ **Complete Application/Questionnaire Form**
Must be signed by all property owners and the applicant(s).

☒ **One copy of the current Grant Deed**
Must include a legal description of the property for which the project is being requested. Please note that the legal description is not the same as the Assessor's Parcel Number (APN).

☒ **One copy of the Preliminary Title Report**
Preliminary title report, chain of title guarantee or equivalent documentation not older than six (6) months which shows any and all lienholders and easements affecting the project site.

☒ **8 ½" by 11" reproducible, to scale, legible plot plan which clearly shows the intended project, indicate the dimensions of the property, the location and dimensions of all existing and proposed buildings, landscaping, parking spaces and driveways (include their dimensions), location of any existing or proposed septic tank and leach lines, irrigation lines and/or drainage ditches, all recorded irrigation and utility easements, north arrow, indicate scale and other data which may be pertinent. In urbanized areas please identify all adjacent driveways and property structures.**
See example plot plans on pages 20 & 21 – Larger copies of the plot plan may also be submitted and in some cases may be required or requested by staff.

☒ **8 ½" by 11" reproducible, to scale, legible area map, showing specific land uses (crops, houses, buildings, parcel lines and parcel sizes, etc.) for the adjacent two parcels in each direction from the subject property.** *See example area map on page 22.*

☒ **Buffer and Setback Guidelines – Statement of Compliance**
A Statement of Compliance must be provided for any new or expanding non-agricultural use proposed in the A-2 (General Agriculture) zoning district or on a parcel adjoining the A-2 zoning district. Reference Appendix "A" of the Stanislaus County General Plan Agricultural Element. Required vegetative screening and fencing shall be reflected on all required plot plans and landscaping plans.

☐ **Application Fee**
Reference fee schedule on pages 14 - 16.

☐ **"Will Serve" letter**
Required for water and/or sewer if such services are to be provided by a City, Service District, Sanitary District, etc.

☐ **Adjoining County Information**
Provide the names, address, and assessment numbers of all properties located in an **ADJOINING COUNTY** within one quarter mile (1320 feet) and/or two parcels in each direction, of applicant(s) property**.** *Said information must be taken from the latest assessment roll of the county in question.*

☒ **Property Ownership and Partnership Interest**
Provide a complete list with the complete names of all persons with a property ownership or partnership interest in any property for which the project is being requested and the Grant Deed reflects a trust, corporation, limited liability partnership, or other holding for which all individuals with an interest are not specifically identified by individual name. All individuals identified on the list may be required to sign the application.

General Plan, Community Plan and Specific Plan Amendment:

☐ **A description of the specific area(s) of the General Plan (and Community/Specific Plan, if applicable) which are requested to be changed.**

☐ **A full statement of the reasons and justifications for such changes in the General Plan (and Community/Specific Plan, if applicable) to support your application.**

☐ **A description of the events which have taken place which have rendered portions of the General Plan (and Community/Specific Plan, if applicable) inadequate or unattainable unless the proposed amendment is approved.**

☐ **A description of any studies or policies which have brought into question the specific policies or portions of the General Plan sought to be changed.**

☐ **A description of the effect of the General Plan (i.e., fiscal impact, etc.) upon future development of a specific area or the overall development of Stanislaus County.**

☐ **All applications for a General Plan and Specific Plan Amendment must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Rezone: (Non-Planned Development/Planned Industrial):

☐ **Optional – Written information to support your application is recommended.**

☐ **All applications for a rezone must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Rezone: (Planned Development) - Reference Chapter 21.40 of the Stanislaus County Zoning Ordinance:

☒ **18" by 26" reproducible, to scale, legible plot plan which clearly shows the intended project, indicate the dimensions of the property, the location and dimensions of all existing and proposed building, landscaping, parking spaces and driveways, irrigation lines and/or drainage ditches, all recorded irrigation and utility easements, north arrow, indicate scale and other data which may be pertinent.**
See plot plan example on page 20.

☒ **Development Schedule**
Must include completion date of each proposed phase of development.

☐ **Elevations**
Drawings or pictures showing those sides of any proposed or existing building(s) which will be visible to the public. Said elevations shall need not be final plans, but should at least give an accurate representation of the outside appearance of the structures.

☐ **Sign Plan**
Must include location and size of all proposed signs.

☒ **Parking Analysis**
Reference Chapter 21.76 – Off Street Parking of the Stanislaus County Zoning Ordinance. Plan must account for the use of all proposed and existing buildings/uses.

☒ **Landscaping and Tree Planting Plan**
Reference Chapter 21.102 – Landscape of the Stanislaus County Zoning Ordinance.

☐ **All applications for a rezone must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Rezone: (Planned Industrial) – Reference Chapter 21.42 of the Stanislaus County Zoning Ordinance:

☐ **All items required for a Planned Development**

☐ **Circulation Plan**
Must illustrate the movement and parking of trucks within the development.

☐ **Landscape Analysis**
At least 5% of the parcel area shall be landscaped. 5% required for each phase of development.

☐ **All applications for a rezone must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Rezone: (Industrial Business Park or Light Industrial) – Reference Chapters 21.61 and 21.62 of the Stanislaus County Zoning Ordinance:

☐ **All items required for a Planned Development**
(Landscape Plans reference Chapters 21.61.070 and/or 21.62.070 of the Stanislaus County Zoning Ordinance)

☐ **Proof of compliance with Development Standards as defined in Chapters 21.61.040 and/or 21.62.040 of the Stanislaus County Zoning Ordinance.**

☐ **All applications for a rezone must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Use Permit:

☐ **Elevations**
Drawings or pictures showing those sides of any proposed or existing building(s) which will be visible to the public. Said elevations shall need not be final plans, but should at least give an accurate representation of the outside appearance of the structures.

☐ **Parking Analysis**
Reference Chapter 21.76 – Off Street Parking of the Stanislaus County Zoning Ordinance. Plan must account for the use of all proposed and existing buildings/uses.

☐ **Landscaping and Tree Planting Plan**
Reference Chapter 21.102 – Landscape of the Stanislaus County Zoning Ordinance.

Variance:

☐ **Information sufficient to support the required "Variance Findings" on page 19.**

Subdivision Map:

☐ **Twenty-five (25) 18" by 26" copies of the tentative map drawn to a scale of one inch equals 50 feet (1" = 50') for small subdivisions and one inch equals 100 feet (1" = 100') for large subdivisions. The map must contain the following physical data:**

- **A key or location map showing the general area;**
- **The subdivision name, date, north arrow, scale, boundaries, street names and sufficient description to define location;**
- **Name and address of record owners;**
- **Name and address of subdivider;**
- **Name and address of person(s) preparing map;**
- **Acreage to the nearest tenth of an acre;**
- **Sufficient elevations or contours to show the general slope of the land and high and low points thereof;**
- **Location, name, width, elevation and grades of streets and alleys within the land adjacent to the proposed subdivision;**
- **Location and size of all pipelines, existing irrigation and drainage facilities, irrigation and drainage patterns, existing or proposed water wells, septic tanks and drainage (leach) fields, sewage lines and structures used in connecting therewith. Sewer leach fields including those bordering the proposed subdivision may be required to be shown at the discretion of the Director of Environmental Resources;**
- **Location and character of existing or proposed utilities;**
- **Width, location, and purpose of existing or proposed easements;**
- **Lot layout with appropriate dimensions of each lot, and each lot and block shall be numbered;**
- **Outline of existing buildings and mobile homes to remain in place within the subdivision and in relation to existing and proposed streets, lot and building lines;**
- **Location of all areas subject to inundation by floods or storm water overflow and the width and direction of flow of all water courses;**
- **Typical street sections;**
- **Tax Assessor's parcel number as shown on the latest County Assessment Roll;**
- **Any improvements proposed which are not a requirement;**
- **Proposed method of storm water drainage;**
- **Proposed method of sewage disposal;**
- **Proposed method of providing domestic water, location and type of fire hydrants and existing or proposed wells to be used; and,**
- **Preliminary soil report of the subdivision, prepared by a registered civil engineer.**

**** All maps must be folded to no greater than 8 ½" x 11" upon submittal.***
** For vesting maps, additional information, including detailed grading plans, building details, sewer, water, storm drain and road details and information on proposed building uses may be required, at the discretion of the County.*

☐ **8 ½" by 11" reproducible copy of tentative map**

☐ **Tree Planting Plan**
Reference Chapter 21.102 – Landscape of the Stanislaus County Zoning Ordinance.

☐ **Information supporting compliance with County General Plan Policies regarding parks.**
Not required for parcels being created within non-residential zoning districts.

☐ **All applications for a subdivision map must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Parcel Map:

☐ **Ten (10) 18" by 26" copies of the tentative map drawn to a legible scale. The map must contain the following physical data:**

- **Sufficient description to define the location, date, north arrow, scale and boundaries; (full width of all streets bordering the property must be shown);**
- **Name and address of record owner(s);**
- **Name and address of person(s) preparing map;**
- **Acreage to the nearest tenth of an acre; parcels less than one acre in area may be noted in square feet;**
- **Location and size of all pipelines, existing irrigation and drainage facilities, irrigation and drainage patterns, existing or proposed water wells, septic tanks and drainage (leach) fields, sewage lines and structures used in connecting therewith, water table depth, soil type, slope of the land;**
- **Outline of existing buildings and mobile homes to remain in place within the subdivision, showing the distance to existing or proposed streets, lots and building lines;**
- **Tax Assessor's parcel number as shown on the latest County Assessment Roll.**

All maps must be folded to no greater than 8 ½ " x 11" upon submittal.

☐ **8 ½" by 11" reproducible copy of parcel map**

☐ **Information supporting compliance with County General Plan Policies regarding parks**
Not required for parcels being created within non-residential zoning districts.

** For vesting maps, additional information, including detailed grading plans, building details, sewer, water, storm drain and road details and information on proposed building uses may be required, at the discretion of the County.*

☐ **All applications for a parcel map must include a records search for historical and cultural resources obtained from the Central California Information Center, 801 Monte Vista Avenue, Turlock 95382, (209) 667-3307 (contact Elizabeth Greathouse).**

Exception (To the Subdivision Ordinance):

☐ **Information sufficient to support the required "Exception Findings" shown on page 19.**

Williamson Act Cancellation:

☐ **Written information discussing alternative use of the land and anticipated time frame for implementation of the alternative use.**

APPLICATION CHECKLIST MUST BE SUBMITTED WITH APPLICATION QUESTIONNAIRE

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400, Modesto, CA 95354
Planning Phone: (209) 525-6330 Fax: (209) 525-5911
Building Phone: (209) 525-6557 Fax: (209) 525-7759
Form Available Online: http://www.stancounty.com/planning/applications.shtm

APPLICATION QUESTIONNAIRE

Please Check all applicable boxes
APPLICATION FOR:

Staff is available to assist you with determining which applications are necessary

- ☐ **General Plan Amendment**
- ☒ **Rezone**
- ☐ **Use Permit**
- ☐ **Variance**
- ☐ **Historic Site Permit**
- ☐ **Subdivision Map**
- ☐ **Parcel Map**
- ☐ **Exception**
- ☐ **Williamson Act Cancellation**
- ☐ **Other** _____

PLANNING STAFF USE ONLY:

Application No(s): _____ _____ _____
Date: _____
S _____ **T** _____ **R** _____
GP Designation: _____
Zoning: _____
Fee: _____
Receipt No. _____
Received By: _____
Notes: _____

In order for your application to be considered COMPLETE, please answer all applicable questions on the following pages, and provide all applicable information listed on the checklist on pages i – v. Under State law, upon receipt of this application, staff has 30 days to determine if the application is complete. We typically do not take the full 30 days. It may be necessary for you to provide additional information and/or meet with staff to discuss the application. Pre-application meetings are not required, but are highly recommended. An incomplete application will be placed on hold until all the necessary information is provided to the satisfaction of the requesting agency. An application will not be accepted without all the information identified on the checklist.

Please contact staff at (209) 525-6330 to discuss any questions you may have. Staff will attempt to help you in any way we can.

PROJECT INFORMATION

PROJECT DESCRIPTION: (Describe the project in detail, including physical features of the site, proposed improvements, proposed uses or business, operating hours, number of employees, anticipated customers, etc. – Attach additional sheets as necessary)

Please note: A detailed project description is essential to the reviewing process of this request. In order to approve a project, the Planning Commission or the Board of Supervisors must decide whether there is enough information available to be able to make very specific statements about the project. These statements are called "Findings". It is your responsibility as an applicant to provide enough information about the proposed project, so that staff can recommend that the Commission or the Board make the required Findings. Specific project Findings are shown on pages 17 – 19 and can be used as a guide for preparing your project description. (If you are applying for a Variance or Exception, please contact staff to discuss special requirements).

Please see attached project description document

PROJECT SITE INFORMATION

Complete and accurate information saves time and is vital to project review and assessment. Please complete each section entirely. If a question is not applicable to your project, please indicated this to show that each question has been carefully considered. Contact the Planning & Community Development Department Staff, 1010 10th Street – 3rd Floor, (209) 525-6330, if you have any questions. Pre-application meetings are highly recommended.

ASSESSOR'S PARCEL NUMBER(S): **Book** 045 **Page** 050 **Parcel** 010

Additional parcel numbers: _____

Project Site Address or Physical Location: _____

_____

Property Area: Acres: 8.6 or Square feet: 378,483

Current and Previous Land Use: (Explain existing and previous land use(s) of site for the last ten years)

Current use is vacant, undeveloped land

List any known previous projects approved for this site, such as a Use Permit, Parcel Map, etc.: (Please identify project name, type of project, and date of approval)

_____

_____

Existing General Plan & Zoning: General Plan: Planned Development / Zoning : General Ag, 10 Acre

Proposed General Plan & Zoning: *General Plan: Planned Development / Zoning Commercial*
(if applicable)

ADJACENT LAND USE: (Describe adjacent land uses within 1,320 feet (1/4 mile) and/or two parcels in each direction of the project site)

East: Planned Development - General Commercial

West: Planned Development - General Commercial

North: Single Family / Rural Residential

South: Planned Development - Gas Station & General Commercial

WILLIAMSON ACT CONTRACT:

Yes ☐ **No** ☒

Is the property currently under a Williamson Act Contract?
Contract Number: _____

If yes, has a Notice of Non-Renewal been filed?

Date Filed: _____

Yes ☐ **No** ☒ Do you propose to cancel any portion of the Contract?

Yes ☐ **No** ☒ Are there any agriculture, conservation, open space or similar easements affecting the use of the project site. (Such easements do not include Williamson Act Contracts)

If yes, please list and provide a recorded copy: _____

_____

SITE CHARACTERISTICS: (Check one or more) Flat ☒ Rolling ☐ Steep ☐

VEGETATION: What kind of plants are growing on your property? (Check one or more)

Field crops ☐ Orchard ☐ Pasture/Grassland ☐ Scattered trees ☒

Shrubs ☒ Woodland ☐ River/Riparian ☐ Other ☐

Explain Other: _____

Yes ☐ **No** ☒ Do you plan to remove any trees? (If yes, please show location of trees planned for removal on plot plan and provide information regarding transplanting or replanting.)

GRADING:

Yes ☒ **No** ☒ Do you plan to do any grading? (If yes, please indicate how many cubic yards and acres to be disturbed. Please show areas to be graded on plot plan.) _____

Site is relatively flat, site grading amounts are unknown at this time

STREAMS, LAKES, & PONDS:

Yes ☐ **No** ☒ Are there any streams, lakes, ponds or other watercourses on the property? (If yes, please show on plot plan)

Yes ☐ **No** ☒ Will the project change any drainage patterns? (If yes, please explain – provide additional sheet if needed) _____

_____

Yes ☐ **No** ☒ Are there any gullies or areas of soil erosion? (If yes, please show on plot plan)

Yes ☐ **No** ☒ Do you plan to grade, disturb, or in any way change swales, drainages, ditches, gullies, ponds, low lying areas, seeps, springs, streams, creeks, river banks, or other area on the site that carries or holds water for any amount of time during the year? (If yes, please show areas to be graded on plot plan)

Please note: If the answer above is yes, you may be required to obtain authorization from other agencies such as the Corps of Engineers or California Department of Fish and Game.

STRUCTURES:

Yes ☐ **No** ☒ Are there structures on the site? (If yes, please show on plot plan. Show a relationship to property lines and other features of the site.

Yes ☐ **No** ☒ Will structures be moved or demolished? (If yes, indicate on plot plan.)

Yes ☒ **No** ☐ Do you plan to build new structures? (If yes, show location and size on plot plan.)

Yes ☐ **No** ☒ Are there buildings of possible Historical significance? (If yes, please explain and show location and size on plot plan.) _____

_____

PROJECT SITE COVERAGE:

Existing Building Coverage: 0 Sq. Ft.

Proposed Building Coverage: 36,715 Sq. Ft.

Landscaped Area: *64,245* Sq. Ft.

Paved Surface Area: *16,373* Sq. Ft.

BUILDING CHARACTERISTICS:

Size of new structure(s) or building addition(s) in gross sq. ft.: (Provide additional sheets if necessary)_____

Please see attached building and area list

Number of floors for each building: _____

All buildings are 1 story

Building height in feet (measured from ground to highest point): (Provide additional sheets if necessary)_____

Maximum building height will be 40'-0"

Height of other appurtenances, excluding buildings, measured from ground to highest point (i.e., antennas, mechanical equipment, light poles, etc.): (Provide additional sheets if necessary)_____

Site lighting fixtures will be +/- 25'-0"

Proposed surface material for parking area: (Provide information addressing dust control measures if non-asphalt/concrete material to be used) _____

Parking area will be constructed of asphalt and decorative concrete

UTILITIES AND IRRIGATION FACILITIES:

Yes ☐ **No** ☒ Are there existing public or private utilities on the site? Includes telephone, power, water, etc. (If yes, show location and size on plot plan)

Who provides, or will provide the following services to the property?

Electrical: _____

Telephone:_____

Water**: _____

Sewer*: _____

Gas/Propane: _____

Irrigation: _____

***Please Note: A "will serve" letter is required if the sewer service will be provided by City, Sanitary District, Community Services District, etc.**

****Please Note: A "will serve" letter is required if the water source is a City, Irrigation District, Water District, etc., and the water purveyor may be required to provide verification through an Urban Water Management Plan that an adequate water supply exists to service your proposed development.**

Will any special or unique sewage wastes be generated by this development other than that normally associated with resident or employee restrooms? Industrial, chemical, manufacturing, animal wastes? (Please describe:)

No

Please Note: Should any waste be generated by the proposed project other than that normally associated with a single family residence, it is likely that Waste Discharge Requirements will be required by the Regional Water Quality Control Board. Detailed descriptions of quantities, quality, treatment, and disposal may be required.

Yes ☐ **No** ☒ Are there existing irrigation, telephone, or power company easements on the property? (If yes, show location and size on plot plan.)

Yes ☐ **No** ☒ Do the existing utilities, including irrigation facilities, need to be moved? (If yes, show location and size on plot plan.)

Yes ☐ **No** ☒ Does the project require extension of utilities? (If yes, show location and size on plot plan.)

AFFORDABLE HOUSING/SENIOR:

Yes ☐ **No** ☒ Will the project include affordable or senior housing provisions? (If yes, please explain)

RESIDENTIAL PROJECTS: (Please complete if applicable – Attach additional sheets if necessary)

Total No. Lots:_____ Total Dwelling Units:_____ Total Acreage:_____

Net Density per Acre: _____ Gross Density per Acre: _____

(complete if applicable)	Single Family	Two Family Duplex	Multi-Family Apartments	Multi-Family Condominium/ Townhouse
Number of Units:				
Acreage:				

COMMERCIAL, INDUSTRIAL, MANUFACTURING, RETAIL, USE PERMIT, OR OTHER PROJECTS: (Please complete if applicable – Attach additional sheets if necessary)

Square footage of each existing or proposed building(s): *Please see attachment*

Type of use(s): _____

Days and hours of operation: _____

_____

Seasonal operation (i.e., packing shed, huller, etc.) months and hours of operation: _____

_____

Occupancy/capacity of building: _____

_____

Number of employees: (Maximum Shift): _____ (Minimum Shift): _____

Estimated number of daily customers/visitors on site at peak time: _____

Other occupants: _____

_____

Estimated number of truck deliveries/loadings per day: _____

Estimated hours of truck deliveries/loadings per day: _____

Estimated percentage of traffic to be generated by trucks: _____

Estimated number of railroad deliveries/loadings per day: _____

Square footage of:

Office area: _____ Warehouse area: _____

Sales area: _____ Storage area: _____

Loading area: _____ Manufacturing area: _____

Other: (explain type of area) _____

Yes ☐ **No** ☐ Will the proposed use involve toxic or hazardous materials or waste? (Please explain)

_____

_____

_____

_____

ROAD AND ACCESS INFORMATION:

What County road(s) will provide the project's main access? (Please show all existing and proposed driveways on the plot plan)

North Golden State Boulevard and Nunes Road

_____

_____

Yes ☐ **No** ☒ Are there private or public road or access easements on the property now? (If yes, show location and size on plot plan)

Yes ☐ **No** ☒ Do you require a private road or easement to access the property? (If yes, show location and size on plot plan)

Yes ☐ **No** ☒ Do you require security gates and fencing on the access? (If yes, show location and size on plot plan)

Please Note: Parcels that do not front on a County-maintained road or require special access may require approval of an Exception to the Subdivision Ordinance. Please contact staff to determine if an exception is needed and to discuss the necessary Findings.

STORM DRAINAGE:

How will your project handle storm water runoff? (Check one) ☐ Drainage Basin ☐ Direct Discharge ☐ Overland

☒ Other: (please explain) *Underground drainage piping with percolation*

If direct discharge is proposed, what specific waterway are you proposing to discharge to? _____

Please Note: If direct discharge is proposed, you will be required to obtain a NPDES permit from the Regional Water Quality Control Board, and must provide evidence that you have contacted them regarding this proposal with your application.

EROSION CONTROL:

If you plan on grading any portion of the site, please provide a description of erosion control measures you propose to implement.

No

Please note: You may be required to obtain an NPDES Storm Water Permit from the Regional Water Quality Control Board and prepare a Storm Water Pollution Prevention Plan.

ADDITIONAL INFORMATION:

Please use this space to provide any other information you feel is appropriate for the County to consider during review of your application. (Attach extra sheets if necessary)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - STORM WATER PERMIT REQUIREMENTS

Storm water discharges associated with construction activity are a potentially significant source of pollutants. The most common pollutant associated with construction is sediment. Sediment and other construction related wastes can degrade water quality in creeks, rivers, lakes, and other water bodies. In 1992, the State Water Resources Control Board adopted a statewide General Permit for all storm water discharges associated with construction activity that disturbs five or more acres of land. Effective March 10, 2003, all construction sites disturbing one or more acres of land will be required to obtain permit coverage. The General Permit is intended to ensure that construction activity does not impact water quality.

You need to obtain General Permit coverage if storm water discharges from your site and either of the following apply:

- Construction activities result in one or more acres of land disturbance, including clearing, grading, excavating, staging areas, and stockpiles or;
- The project is part of a larger common plan of development or sale (e.g., subdivisions, group of lots with or without a homeowner's association, some lot line adjustments) that result in one or more acres of land disturbance.

It is the applicants responsibility to obtain any necessary permit directly from the California Regional Water Quality Control Board. The applicant(s) signature on this application form signifies an acknowledgment that this statement has been read and understood.

STATE OF CALIFORNIA HAZARDOUS WASTE AND SUBSTANCES SITES LIST (C.G.C. § 65962.5)

Pursuant to California Government Code Section 65962.5(e), before a local agency accepts as complete an application for any development project, the applicant shall consult the latest State of California Hazardous Waste and Substances Sites List on file with the Planning Department and submit a signed statement indicating whether the project is located on a site which is included on the List. The List may be obtained on the California State Department of Toxic Substances Control web site (http://www.envirostor.dtsc.ca.gov/public).

The applicant(s) signature on this application form signifies that they have consulted the latest State of California Hazardous Waste and Substances List on file with the Planning Department, and have determined that the project site ☐ **is or** ☒ **is not** included on the List.

Date of List consulted: _____

Source of the listing: _____
(To be completed only if the site is included on the List)

ASSESSOR'S INFORMATION WAIVER

The property owner(s) signature on this application authorizes the Stanislaus County Assessor's Office to make any information relating to the current owners assessed value and pursuant to R&T Code Sec. 408, available to the Stanislaus County Department of Planning and Community Development.

PROJECT DESCRIPTION

The proposed development aims to enhance the local economy, provide essential services, and cater to the needs of the community while adhering to the county's zoning regulations and land use policies.

Project Overview: The project entails the development of a multi-functional commercial complex designed to accommodate various services, including a convenience store, gas station, two quick-serve restaurants, a truck wash and fueling area, and an 18,000 square foot banquet hall. Strategically located at [insert location/address], the proposed development will serve as a convenient stop for travelers, commuters, and local residents, contributing to the vitality and accessibility of the area.

Key Components

1. **Convenience Store**
   - The convenience store will offer a wide range of products, including groceries, snacks, beverages, and essential household items.
   - It will feature a modern layout with ample space for customer convenience and efficient shelving for product display.
   - The store will prioritize cleanliness, safety, and accessibility to ensure a pleasant shopping experience for patrons.

2. **Gas Station**
   - The gas station will feature multiple fuel pumps equipped to dispense gasoline, diesel, and other fuel types.
   - State-of-the-art fueling infrastructure will be implemented to facilitate quick and efficient refueling for vehicles of all sizes.
   - Environmental considerations will be incorporated, including vapor recovery systems and spill containment measures, to mitigate potential risks.

3. **Quick Serve Restaurants**
   - Two quick-serve restaurants will be included, offering a diverse selection of fast and convenient dining options.
   - The restaurants will feature modern architectural designs and efficient kitchen layouts to streamline operations and accommodate high customer traffic.
   - Outdoor seating areas may be incorporated to provide patrons with an inviting space to enjoy their meals.

4. **Truck Wash and Fueling Area**
   - A dedicated truck wash and fueling area will be established to cater to the needs of commercial truck drivers and fleet operators.
   - The facility will offer comprehensive cleaning services, including exterior wash, interior detailing, and sanitation, to maintain the hygiene and appearance of vehicles.
   - Fueling stations equipped with high-flow pumps will be provided to accommodate large trucks and facilitate efficient refueling operations.

5. **Banquet Hall:**
    - An 18,000 +/- square foot banquet hall will be constructed to host a variety of events, including weddings, conferences, and community gatherings.
    - The banquet hall will feature modern amenities, flexible layout options, and state-of-the-art audiovisual equipment to accommodate diverse event requirements.
    - Professional event planning and catering services may be offered to provide a seamless experience for clients and guests.

    Please see pages 3-6 of this document for a separate PROJECT DESCRIPTION specifically related to the banquet hall portion of the project.

Community Benefits

- **Job Creation**
  The proposed development will generate employment opportunities for local residents, including positions in retail, food service, hospitality, maintenance, and administration.

- **Economic Growth**
  By attracting visitors and stimulating commercial activity, the project will contribute to the economic growth of the area and generate revenue for local businesses and government agencies.

- **Convenience and Accessibility**
  The availability of essential services, combined with easy access from major thoroughfares, will enhance the convenience and accessibility of the area for both residents and travelers.

Conclusion

In summary, the proposed development represents a significant opportunity to revitalize the targeted parcel in Stanislaus County and create a vibrant commercial hub that meets the diverse needs of the community. Through careful planning, innovative design, and adherence to regulatory standards, the project aims to deliver a sustainable and socially responsible development that enhances the quality of life for all stakeholders involved.

PROJECT DESCRIPTION

BANQUET HALL

Introduction

We propose the development of an upscale Banquet Hall and Event Space on Nunes Road in Stanislaus County, CA. The facility aims to provide a sophisticated and versatile venue for a wide range of events, accommodating both private and corporate gatherings. The project encompasses an 18,000 (+/-) square foot facility with two separate event spaces, a 10,000 square foot area, and a 6,000 square foot space, allowing the simultaneous hosting of two events. Additionally, a commercial kitchen will be integrated to facilitate catering services, enhancing the overall experience for our clients.

Location

The chosen location on Nunes Road provides convenient accessibility for residents and visitors alike. Situated in Stanislaus County, the venue aims to become a focal point for events in the region, contributing to the local economy and community engagement.

Facility Features

1. *Event Spaces:* The facility boasts two distinct event spaces, ensuring flexibility for various event sizes and types. Whether it's an intimate gathering or a grand celebration, our venue can cater to diverse client needs.
2. *Commercial Kitchen:* To ensure a seamless and high-quality catering service, a state-of-the-art commercial kitchen will be incorporated into the facility. This feature allows us to offer customizable catering options, enhancing the overall event experience.

Operating Schedule

The Banquet Hall and Event Space will primarily operate during evenings from Thursday through Sunday. This schedule is designed to accommodate a wide range of events, including weddings, corporate functions, and social gatherings. Additionally, the facility is open to daytime events, providing flexibility for conferences, seminars, and other daytime activities.

Community Benefits

1. *Economic Contribution:* The project is expected to generate economic growth by attracting events and visitors to Stanislaus County. This, in turn, will benefit local businesses, hotels, and service providers.
2. *Community Engagement:* Our facility aims to serve as a hub for community events, creating a space for residents to come together for celebrations, fundraisers, and cultural events.

Environmental Considerations

We are committed to environmental sustainability and will implement eco-friendly practices in the construction and operation of the facility. This includes energy-efficient lighting, waste reduction measures, and landscaping that enhances the natural environment.

Conclusion

We believe that our proposed Banquet Hall and Event Space will be a valuable addition to the community, offering a premium venue for diverse events and contributing positively to the local economy. We look forward to working collaboratively with the planning department to ensure that our project aligns with the community's vision and meets all regulatory requirements.

Operational Plan

Venue Management

The facility, spanning 30,000 square feet, includes two distinct event spaces, a commercial kitchen, and an extensive parking facility. Each area is meticulously designed to accommodate various events, from intimate gatherings to large-scale celebrations.

Booking and Reservation Process

We will implement a user-friendly online booking system, coupled with personalized client consultations and site visits. Our transparent reservation process includes clear timelines, flexible payment options, and client-friendly cancellation policies.

Event Coordination

Dedicated event coordinators will oversee each function, ensuring meticulous planning and execution. We maintain open communication channels with clients and collaborate seamlessly with external vendors to deliver memorable experiences.

Staffing

Our highly-trained staff, including event coordinators, catering professionals, and security personnel, are committed to providing exceptional service. Staffing schedules are optimized to cover events during evenings and weekends.

Catering Services

The integration of a state-of-the-art commercial kitchen allows us to offer customizable catering options. Our culinary team is dedicated to delivering high-quality, diverse menus tailored to each client's preferences.

Technology Integration

We leverage advanced technology, including event management software and audio-visual equipment, to enhance the efficiency and effectiveness of our operations.

Health and Safety Protocols

The safety and well-being of our clients and staff are paramount. We have implemented comprehensive health and safety guidelines, staff training programs, and regular equipment maintenance to ensure a secure environment.

Client Services

Our commitment to exceptional client service extends from the initial inquiry to post-event follow-up. We actively seek and value client feedback to continuously enhance our services.

Vendor Relationships

Established relationships with preferred vendors ensure the availability of high-quality supplies and services. Contracts and agreements are carefully negotiated to guarantee a seamless collaboration.

Regulatory Compliance

We are fully committed to complying with all local regulations and permitting requirements. Our operations will undergo regular audits and inspections to maintain ongoing compliance.

Continuous Improvement

We embrace a culture of continuous improvement, regularly reviewing and updating our operations to incorporate best practices and innovations in the event industry.

COMMERCIAL, INDUSTRIAL, MANUFACTURING, RETAIL, USE PERMIT, OR OTHER PROJECTS:

BUILDING NAME:
BUILDING A

SQUARE FOOTAGE OF EACH EXISTING OR PROPOSED BUILDING(S):
18,891 SF

TYPE OF USE(S):
BANQUET HALL

DAYS AND HOURS OF OPERATION:
PRIMARILY EVENINGS AND WEEKENDS

SEASONAL OPERATION MONTHS AND HOURS OF OPERATION:
N/A

OCCUPANCY/CAPACITY OF BUILDING:
1,000 PEOPLE +/-
(16,000 SF OF BANQUET SPACE AT 15 sf / PERSON)

NUMBER OF EMPLOYEES: (MAXIMUM SHIFT): (MINIMUM SHIFT):
MINIMUM 10 / MAXIMUM 30

ESTIMATED NUMBER OF DAILY CUSTOMERS/VISITORS ON SITE AT PEAK TIME:
1,000 PER DAY / 1,000 AT A TIME

ESTIMATED NUMBER OF TRUCK DELIVERIES/LOADINGS PER DAY:
2-5

ESTIMATED HOURS OF TRUCK DELIVERIES/LOADINGS PER DAY:
6:00 AM – 10:00 AM

ESTIMATED PERCENTAGE OF TRAFFIC TO BE GENERATED BY TRUCKS:
LESS THAN 5%

ESTIMATED NUMBER OF RAILROAD DELIVERIES/LOADINGS PER DAY:
0

SQUARE FOOTAGE OF:

OFFICE AREA:	**1,000 SF**
WAREHOUSE AREA:	
SALES AREA:	
STORAGE AREA:	
LOADING AREA:	
MANUFACTURING AREA:	
OTHER: (EXPLAIN TYPE OF AREA)	
KITCHEN	**1,000 SF**
BANQUET SPACE:	**16,000 SF**

WILL THE PROPOSED USE INVOLVE TOXIC OR HAZARDOUS MATERIALS OR WASTE?

NO

BUILDING NAME:

BUILDING B & E

SQUARE FOOTAGE OF EACH EXISTING OR PROPOSED BUILDING(S):

6,000 SF (STORE)
4,788 (CANOPY)

TYPE OF USE(S):

RETAIL / CONVENIENCE STORE

DAYS AND HOURS OF OPERATION:

24 HOURS

SEASONAL OPERATION MONTHS AND HOURS OF OPERATION:

N/A

OCCUPANCY/CAPACITY OF BUILDING:

40 PEOPLE +/-
(6,000 SF OF SPACE AT 150 sf / PERSON)

NUMBER OF EMPLOYEES: (MAXIMUM SHIFT): (MINIMUM SHIFT):

MINIMUM 3 / MAXIMUM 10

ESTIMATED NUMBER OF DAILY CUSTOMERS / VISITORS ON SITE AT PEAK TIME:

200 PER DAY / 20 AT A TIME

ESTIMATED NUMBER OF TRUCK DELIVERIES/LOADINGS PER DAY:

2-5

ESTIMATED HOURS OF TRUCK DELIVERIES/LOADINGS PER DAY:

6:00 AM – 10:00 AM

ESTIMATED PERCENTAGE OF TRAFFIC TO BE GENERATED BY TRUCKS:

50%

ESTIMATED NUMBER OF RAILROAD DELIVERIES/LOADINGS PER DAY:

0

SQUARE FOOTAGE OF:

OFFICE AREA:	**500 SF**
WAREHOUSE AREA:	
SALES AREA:	**5,500 SF**
STORAGE AREA:	
LOADING AREA:	
MANUFACTURING AREA:	
OTHER: (EXPLAIN TYPE OF AREA)	

WILL THE PROPOSED USE INVOLVE TOXIC OR HAZARDOUS MATERIALS OR WASTE?

NO

BUILDING NAME:

BUILDINGS C & D

SQUARE FOOTAGE OF EACH EXISTING OR PROPOSED BUILDING(S):

4,000 SF

TYPE OF USE(S):

QUICK SERVE RESTAURANT

DAYS AND HOURS OF OPERATION:

10:00 AM – 10:00 PM

SEASONAL OPERATION MONTHS AND HOURS OF OPERATION:

N/A

OCCUPANCY/CAPACITY OF BUILDING:

70 PEOPLE +/-

(3,000 SF OF SPACE AT 15 sf / PERSON) 200

(1,000 SF OF SPACE AT 200 sf / PERSON) 5

NUMBER OF EMPLOYEES: (MAXIMUM SHIFT): (MINIMUM SHIFT):

MINIMUM 1 / MAXIMUM 5

ESTIMATED NUMBER OF DAILY CUSTOMERS / VISITORS ON SITE AT PEAK TIME:

200 PER DAY / 20 AT A TIME

ESTIMATED NUMBER OF TRUCK DELIVERIES/LOADINGS PER DAY:

2-5

ESTIMATED HOURS OF TRUCK DELIVERIES/LOADINGS PER DAY:

MP DE;IVERS

ESTIMATED PERCENTAGE OF TRAFFIC TO BE GENERATED BY TRUCKS:

LESS THAN 5%

ESTIMATED NUMBER OF RAILROAD DELIVERIES/LOADINGS PER DAY:

0

SQUARE FOOTAGE OF:

OFFICE AREA:
WAREHOUSE AREA:
SALES AREA: **3,000 SF**
STORAGE AREA:
LOADING AREA:
MANUFACTURING AREA:
OTHER: (EXPLAIN TYPE OF AREA)
KITCHEN: **1,000 SF**

WILL THE PROPOSED USE INVOLVE TOXIC OR HAZARDOUS MATERIALS OR WASTE?

NO

BUILDING NAME:

BUILDINGS F / G/ H

SQUARE FOOTAGE OF EACH EXISTING OR PROPOSED BUILDING(S):

2,240 SF (TRUCK WASH)
1,841 SF (CANOPY)
1,541 SF (FUEL STORAGE)

TYPE OF USE(S):

TRUCK WASH & FUELING

DAYS AND HOURS OF OPERATION:

24 HOURS

SEASONAL OPERATION MONTHS AND HOURS OF OPERATION:

N/A

OCCUPANCY/CAPACITY OF BUILDING:

5 PEOPLE +/-

NUMBER OF EMPLOYEES: (MAXIMUM SHIFT): (MINIMUM SHIFT):

MINIMUM 1 / MAXIMUM 3

ESTIMATED NUMBER OF DAILY CUSTOMERS / VISITORS ON SITE AT PEAK TIME:

100 PER DAY / 8 AT A TIME

ESTIMATED NUMBER OF TRUCK DELIVERIES/LOADINGS PER DAY:

100

ESTIMATED HOURS OF TRUCK DELIVERIES/LOADINGS PER DAY:

24 HOURS

ESTIMATED PERCENTAGE OF TRAFFIC TO BE GENERATED BY TRUCKS:

100%

ESTIMATED NUMBER OF RAILROAD DELIVERIES/LOADINGS PER DAY:

0

SQUARE FOOTAGE OF:

OFFICE AREA:
WAREHOUSE AREA:
SALES AREA: **2,240 SF**
STORAGE AREA:
LOADING AREA:
MANUFACTURING AREA:
OTHER: (EXPLAIN TYPE OF AREA)

WILL THE PROPOSED USE INVOLVE TOXIC OR HAZARDOUS MATERIALS OR WASTE?

NO

Keyes Community Plan Area
Transportation Impact Assessment

Prepared for:
Stanislaus County Department of Public Works
First Carbon Solutions

February 2020

WC19-3625

FEHR PEERS

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EXECUTIVE SUMMARY

This study presents the analysis and findings of the Transportation Impact Assessment (TIA) conducted for three proposed projects within the Keyes Community Plan (KCP) Area in unincorporated Stanislaus County, California. Descriptions of each of the proposed projects are provided below:

ITC Enterprises (ITC) - 30,000 square-foot semi-truck lease, rental and service facility, and 5,000 square-foot office located at southwest corner of Keyes Road at North Golden State Boulevard.

Nunes Road Travel Plaza (NRTP) - 7,000 square-foot convenience market, 4,278 square-foot potential restaurant, 16-pump fuel station, 14,100 square-foot truck wash and repair, 43 truck parking spaces, and a secondary fueling area with 5 diesel fueling stations at northeast corner of Keyes Road at North Golden State Boulevard.

Kamir Incorporated (KI) - 4,800 square-foot convenience market, two 3,000 square-foot fast food restaurants with drive-thru, 2,000 square-foot fast-food restaurant, 12-pump fuel station, and 30 truck parking spaces at northwest corner of Keyes Road at North Golden State Boulevard.

Transportation impacts at 14 study intersections and 6 freeway mainline segments were evaluated consistent with the Stanislaus County General Plan and Caltrans guidelines under the following study scenarios:

- Existing Conditions
- Existing with Project Conditions
- Cumulative (Year 2040) without Project Conditions
- Cumulative (Year 2040) with Project Conditions

This analysis identifies potentially significant adverse impacts of the proposed project on the surrounding transportation system and recommends measures to mitigate significant impacts. Recommendations for improvements to the project site plan are also provided.

Project Trip Generation

ITC Enterprise is anticipated to add 40 new AM and 43 new PM peak hour vehicle trips to the roadway network.

Nunes Road Travel Plaza is anticipated to add 161 new AM and 82 new PM peak hour vehicle trips to the roadway network.

Kamir Incorporated is anticipated to add 138 new AM and 90 new PM peak hour vehicle trips to the roadway network.

Transportation Impacts

Intersection and freeway impacts were evaluated using impact criteria from the Stanislaus County General Plan and Caltrans guidelines.

Existing with Project Mitigations

The addition of ITC Enterprises project traffic under Existing with Project Conditions would not cause any impacts based on the significance criteria.

The addition of Nunes Road Travel Plaza project traffic and Kamir Incorporated project traffic is anticipated to cause significant impacts at three intersections under Existing with Project Conditions. The mitigation measures for these impacts include the following:

- SR 99 Southbound Ramps at Keyes Road (Intersection 3) and SR 99 Northbound Ramps at Keyes Road (Intersection 4):
    - Modifications to the SR 99/Keyes Road Interchange to include an eastbound right-turn pocket and a southbound right-turn pocket at the intersection of SR 99 Southbound Ramps at Keyes Road, and to include a westbound right-turn lane and a northbound right-turn pocket at the intersection of SR 99 Northbound Ramps at Keyes Road.

- Golden State Boulevard at Keyes Road (Intersection 6):
    - Modifications to the intersection of Golden State Boulevard at Keyes Road to include a second eastbound left-turn pocket and receiving lane, and a channelized free southbound right-turn pocket and receiving lane. Keyes Road between SR 99 Northbound Ramps and Golden State Boulevard must be widened to two lanes in the westbound direction.

Implementation of these improvements would result in reducing the impacts to less-than-significant levels. Therefore, the intersection impacts these three locations are ***less-than-significant with mitigation***.

Cumulative with Project Mitigations

The addition of ITC Enterprise project traffic, Nunes Road Travel Plaza project traffic, and Kamir Incorporated project traffic is anticipated to cause significant impacts at six intersections under Cumulative with Project Conditions. The mitigation measures for these impacts include the following:

- Faith Home Road at Keyes Road (Intersection 1)
    - Widen Keyes Road from two to four lanes between Faith Home Road and Golden State Boulevard. Modify the intersection of Faith Home Road at Keyes Road to include a northbound right-turn pocket.

- SR 99 Southbound Ramps at Keyes Road (Intersection 3) and SR 99 Northbound Ramps at Keyes Road (Intersection 4):

    Widen Keyes Road from two to four lanes between Faith Home Road and Golden State Boulevard. Modifications to the SR 99/Keyes Road Interchange to include a second westbound left-turn pocket and the southbound approach to include one right-turn pocket, one left-turn pocket, and one shared left/through lane at the intersection of SR 99 Southbound Ramps at Keyes Road, and to include a westbound right-turn lane and the northbound approach to include one right-turn pocket and one shared left/through lane at the intersection of SR 99 Northbound Ramps at Keyes Road.

- 9th St/Golden State Blvd at Nunes Road (Intersection 5)
    - Widen Golden State Boulevard from two to four lanes between Nunes Road and the ITC Enterprises Project Driveway and construct a one-lane roundabout at the intersection of 9th Street/Golden State Boulevard at Nunes Road. This improvement shall include Class II bicycle lanes along Golden State Boulevard south of Nunes Road and along Nunes Road west of Golden State Boulevard.

- Golden State Boulevard at Keyes Road (Intersection 6):
    - Widen Keyes Road from two to four lanes between Faith Home Road and Golden State Boulevard. Widen Golden State Boulevard from two to four lanes between Nunes Road and the ITC Enterprises Project Driveway. Modify the intersection of Golden State Boulevard at Keyes Road to have

two left-turn pockets and one right-turn pocket on all approaches; the southbound approach should have a channelized free southbound right-turn pocket and receiving lane. Keyes Road between SR 99 Northbound Ramps and Golden State Boulevard should be widened to three lanes in the westbound direction to accommodate the free southbound right-turn. This improvement shall include Class II bicycle lanes along Golden State Boulevard.

- Nunes Road at Keyes Road (Intersection 8)
    - Construct a receiving lane/acceleration lane for the southbound left-turn movement at the intersection of Nunes Road at Keyes Road.

Project applicants are expected to pay their fair share towards cumulative mitigations through the Keyes Community Plan Area Traffic Impact Fee program. Implementation of these improvements would result in reducing the impacts to less-than-significant levels. Therefore, the intersection impacts for these six locations are ***less-than-significant with mitigation***.

Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. The final proposed Guidelines include a new Section 15064.3 on Vehicle Miles of Travel (VMT) analysis and thresholds for land use developments. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. New Guidelines section 15064.3 states that they do not take effect until July 1, 2020 unless the lead agency adopts them earlier.

Stanislaus County has not established any standards or thresholds related to VMT, therefore the new guidelines have not yet been adopted and are not in effect at this time. Since there are no standards in effect on VMT analysis, a preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed projects was prepared for information and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

The addition of project land uses is expected to increase Total VMT generated by the Keyes Community Plan Area by approximately 17,800 miles under existing conditions and 16,500 miles under cumulative conditions.

Additionally, Total VMT would increase overall in Stanislaus County, but decrease in the adjacent cities of Modesto and Ceres. Results of the VMT analysis indicate the project would contribute to an increase in vehicle miles of travel.

Site Access and Circulation Recommendations

The following recommendations have been provided to improve site access and circulation at **ITC Enterprise**:

1. As a part of the final site plan indicate locations where traffic control devices would be installed. Consider stripping stop bars on the northbound and southbound approach at the intersection west of the main driveway entry off Golden State Boulevard, and on the westbound approach at the intersection west of the internal driveway connecting to the adjacent Peterbilt Development.

2. Ensure that accessible parking is located as close as possible to the main entrance of the proposed office.

3. As a part of the final site plan show an accessible pedestrian path compliant with ADA regulations from Golden State Boulevard to the proposed office.

4. Identify five additional parking spaces to accommodate the projected peak parking demand.

5. Consult with Stanislaus County to ensure that the proposed project design does not conflict with the ultimate provision of bicycle facilities along the project frontage.

6. Identify areas where short-term bicycle parking would be accommodated on the final site plan.

The following recommendations have been provided to improve site access and circulation at **Nunes Road Travel Plaza**:

1. Work with County staff to determine if the project driveway on Nunes Road will be closed or restricted to emergency vehicle traffic only. Install signage if necessary.

2. As a part of the final site plan indicate locations where traffic control devices would be installed. Consider striping stop bars on the northbound approach at the intersection providing access to the drive-thru restaurant and other minor approaches at intersections throughout the site.

3. Reconfigure the site plan to include an internal drive aisle between the north side of the property and the south side of the property. Given the close proximity of the project driveways on Golden State Boulevard to Keyes Road, the southern driveway should be restricted to right-in/right-out access, resulting in all vehicles using the NRTP North Driveway to make left turns into and out of the site. To restrict left-turn access into and out of the NRTP South Driveway, construct a raised median on Golden State Boulevard. Install wayfinding signage as necessary.

   Install a traffic signal at the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard; align both driveways. The westbound approach should have one left-turn pocket and one shared left/through/right lane. The left-turn pocket should be at least 200 feet in length to accommodate typical vehicle queues.

4. Golden State Boulevard along the project frontage should be constructed to accommodate four travel lanes with turn pockets (five vehicle lanes total), a raised median, and two bicycle lanes in each direction.

5. Provide information on the number of seats proposed in the fast-food restaurant. Should the number of seats proposed in the fast-food restaurant exceed 260 (65 x 4), additional parking must be provided at a rate of 1 space per 4 additional seats.

6. As a part of the final site plan show an accessible pedestrian path compliant with ADA regulations from Golden State Boulevard to the fast-food restaurant located adjacent to the southern property line.

7. Consult with Stanislaus County to ensure that the proposed project design does not conflict with the ultimate provision of bicycle facilities along the project frontage.

8. Identify areas where short-term bicycle parking would be accommodated on the final site plan.

The following recommendations have been provided to improve site access and circulation at **Kamir Incorporated**:

1. As a part of the final site plan indicate locations where traffic control devices would be installed. Consider stripping stop bars on minor approaches at intersections throughout the site.

2. Reconfigure the site plan to include a two-way internal drive aisle between the north side of the property and the south side of the property. Vehicles will use the KI Middle Driveway to make left turns into and out of the site. Restrict left-turn access into and out of the KI South Driveway by constructing a raised median on Golden State Boulevard. Install wayfinding signage as necessary.

   Install a traffic signal at the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard; align both driveways. The eastbound approach operates at acceptable levels with one shared left/through/right lane, however, should the site plan changes increase the volume of right-turns out of the KI Middle Drive, reconfigure the eastbound approach to include one shared left/through lane and one right-turn pocket.

3. Golden State Boulevard along the project frontage should be constructed to accommodate four travel lanes with turn pockets (five vehicle lanes total), a raised median, and two bicycle lanes in each direction.

4. As the restaurant portion of the site is leased, conduct parking surveys to determine if the proposed tenant mix is effectively sharing the available parking supply, and implement additional parking demand management strategies, if necessary.

5. Consult with Stanislaus County to ensure that the proposed project design does not conflict with the ultimate provision of bicycle facilities along the project frontage.

6. Identify areas where short-term bicycle parking would be accommodated on the final site plan.

INTRODUCTION

This study presents the analysis and findings of the Transportation Impact Assessment (TIA) conducted for three proposed projects within the Keyes Community Plan (KCP) Area in unincorporated Stanislaus County, California. The TIA evaluates the projects' potential impacts to the roadway system under existing and cumulative scenarios.

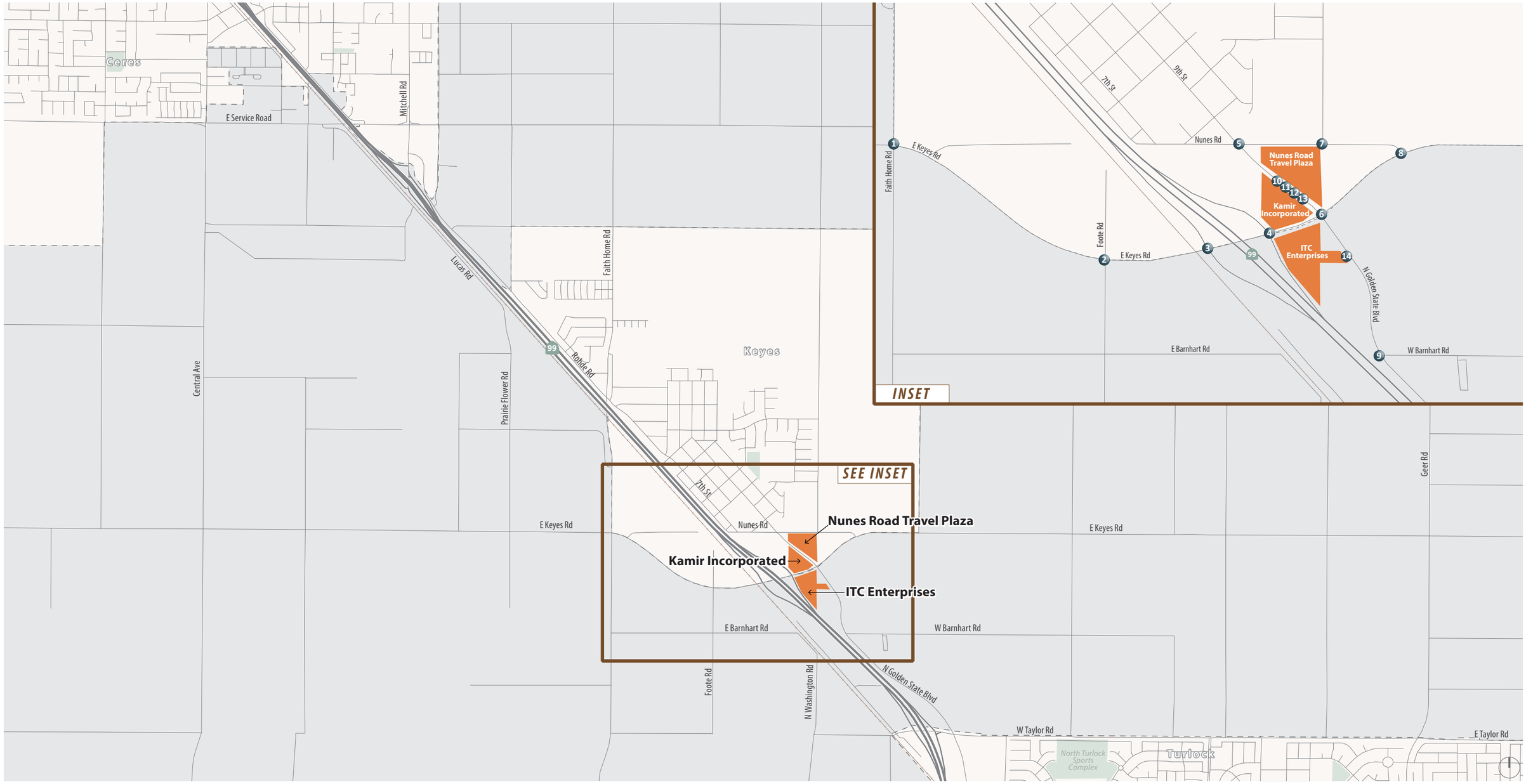
The three proposed projects are all located near the intersection of Keyes Road at North Golden State Boulevard, as shown on **Figure 1**. Descriptions of each of the proposed projects are provided below:

ITC Enterprises (ITC) - 30,000 square-foot semi-truck lease, rental and service facility, and 5,000 square-foot office located at southwest corner of Keyes Road at North Golden State Boulevard.

Nunes Road Travel Plaza (NRTP) - 7,000 square-foot convenience market, 4,278 square-foot potential restaurant, 16-pump fuel station, 14,100 square-foot truck wash and repair, 43 truck parking spaces, and a secondary fueling area with 5 diesel fueling stations at northeast corner of Keyes Road at North Golden State Boulevard.

Kamir Incorporated (KI) - 4,800 square-foot convenience market, two 3,000 square-foot fast food restaurants with drive-thru, 2,000 square-foot fast-food restaurant, 12-pump fuel station, and 30 truck parking spaces at northwest corner of Keyes Road at North Golden State Boulevard.

Site plans for each of the proposed projects are provided on **Figures 2A-C**.



Project Sites

Figure 1

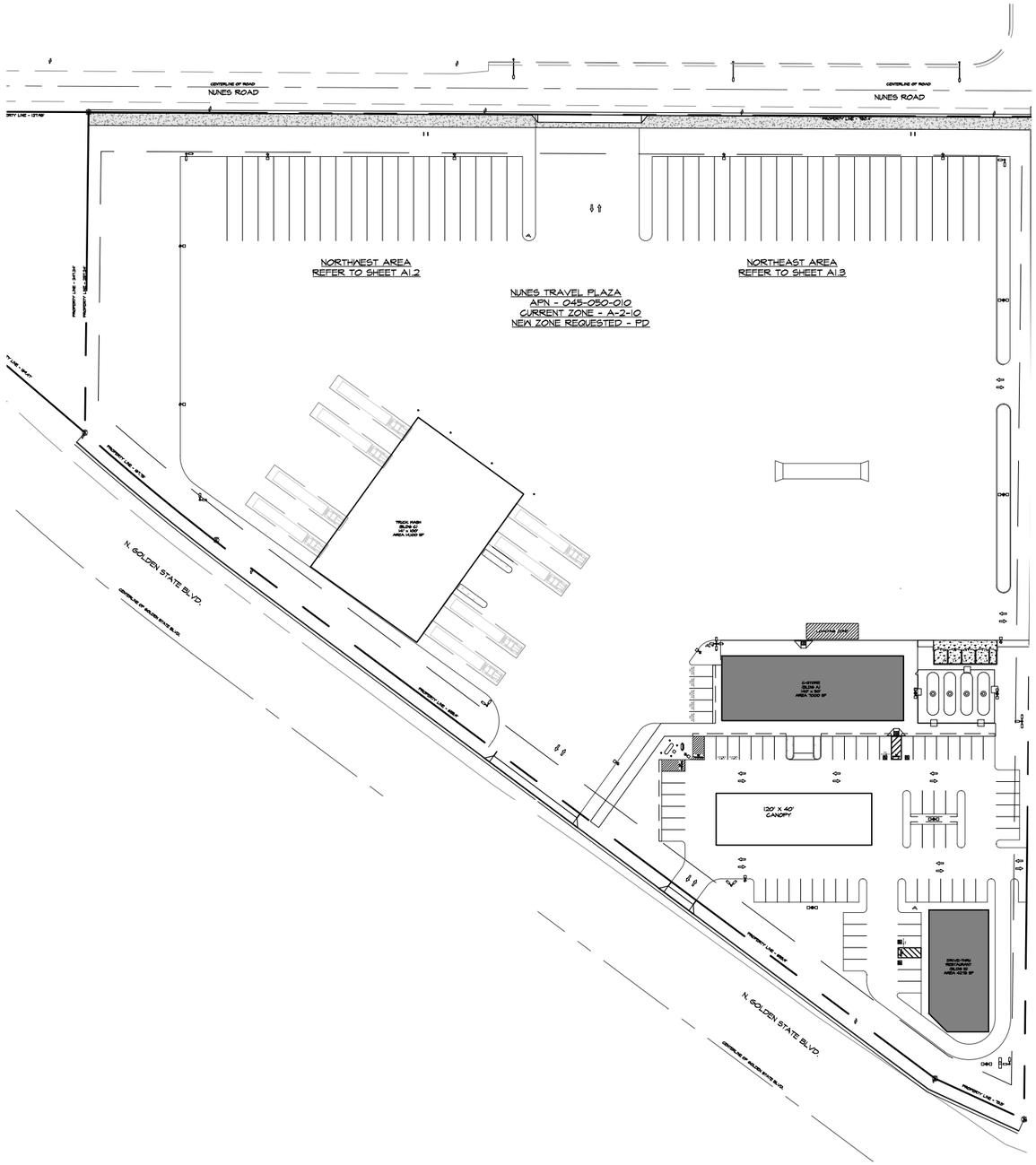
Project Site Vicinity and Study Intersection Locations



Site Plan Source: North Star Engineering Group, 2018.

Figure 2A

Conceptual Project Site Plan — ITC Enterprises



Site Plan Source: Central Valley Engineering & Surveying, Inc., 1/22/18.

Figure 2B

Conceptual Project Site Plan — Nunes Road Travel Plaza



Site Plan Source: Magallon Construction Co., Inc., 10/4/18.

Figure 2C

Conceptual Project Site Plan — Kamir Incorporated

Project Study Area

The study area for this assessment includes the area immediately adjacent to the project site, along with roadways that provide primary access to the regional transportation network. Project impacts to study area roadway facilities were determined by measuring the effect project traffic would have on intersection operations during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods to coincide with the time-periods when adjacent street traffic demands are greatest and when the projects are expected to generate the most traffic.

The following intersections were selected for evaluation in consultation with Stanislaus County staff. Intersections 10 through 14 are new intersections that would be constructed with the proposed projects:

1. Faith Home Road at Keyes Road
2. Foote Road at Keyes Road
3. State Route 99 (SR 99) Southbound Ramps at Keyes Road
4. SR 99 Northbound Ramps at Keyes Road
5. 9th Street/Golden State Boulevard at Nunes Road
6. Golden State Boulevard at Keyes Road
7. South Washington at Nunes Road
8. Nunes Road at Keyes Road
9. Golden State Boulevard at Barnhart Road
10. KI (North) Driveway at Golden State Boulevard
11. KI (Middle)/NRTP (North) Driveways at Golden State Boulevard
12. NRTP (South) Driveway at Golden State Boulevard
13. KI (South) Driveway at Golden State Boulevard
14. ITC Driveway at Golden State Boulevard

The SR 99 freeway mainline segments and ramp junctions north and south of the SR 99/Keyes Road interchange were also selected for evaluation:

SR 99 Mainline

1. Northbound SR 99 Off Ramp to Keyes Road (Diverge)
2. Northbound SR 99 between Off Ramp and On Ramp at Keyes Road (Basic)
3. Northbound SR 99 On Ramp from Keyes Road (Merge)
4. Southbound SR 99 Off Ramp to Keyes Road (Diverge)

5. Southbound SR 99 between Off Ramp and On Ramp at Keyes Road (Basic)
6. Southbound SR 99 On Ramp from Keyes Road (Merge)

Analysis Scenarios

The study area was evaluated for the following scenarios:

Scenario 1: *Existing Conditions* – Existing traffic volumes collected in August 2019. Existing roadway geometries confirmed through field reconnaissance.

Scenario 2: *Existing with ITC Enterprises* – Existing traffic volumes plus traffic expected to be generated by the ITC Enterprises project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

Scenario 3: *Existing with Nunes Travel Plaza* – Existing traffic volumes plus traffic expected to be generated by the Nunes Travel Plaza project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

Scenario 4: *Existing with Kamir Incorporated* – Existing traffic volumes plus traffic expected to be generated by the Kamir Incorporated project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

Scenario 5: *Existing with ITC Enterprises, Nunes Travel Plaza, and Kamir Incorporated (Existing with Project Trips Combined)* – Existing traffic volumes plus traffic expected to be generated by all three development proposals in the area. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

Scenario 6: *Cumulative (Year 2040) without Project Conditions* – Projected cumulative traffic volumes based on land-use growth in Three-County Travel Demand Model, recently updated to reflect the Ceres General Plan update

Scenario 7: *Cumulative (Year 2040) with Project Conditions* – Projected cumulative traffic volumes plus traffic expected to be generated by all three development proposals.

Analysis Methodology

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow from a vehicle driver's perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions) to LOS F (over capacity conditions).

Intersections

Intersection operations were conducted using Synchro 10 traffic analysis program which contains methodologies consistent with Transportation Research Board's *Highway Capacity Manual, 6th Edition* (HCM). The HCM methodology for signalized intersections estimates the average control delay for vehicles at the intersection while the methodology for unsignalized intersections estimates the worst-case movement control delay and the average control delay.

Table 1: Intersection LOS Criteria

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
		Delay (seconds/vehicle)	
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	< 10.0	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

Source: *Highway Capacity Manual*, 6th Edition. (Transportation Research Board, 2016)

After the quantitative delay estimates are complete, the methodology assigns a qualitative letter grade that represents the operations of the intersection. Descriptions of the LOS letter grades for both signalized and unsignalized intersections are provided in **Table 1**. This method evaluates each intersection in isolation and the effects of vehicle queue spillback are not considered in the analysis results.

Freeway Facilities

Freeway segments were evaluated using the Highway Capacity Software 7 (HCS) using the HCM 6th Edition methodology. The freeway LOS is calculated for each study facility based on vehicle density (the number of vehicles per hour per lane). **Table 2** summarizes the relationship between vehicle density and LOS different freeway segment types.

Table 2: Freeway Mainline and Ramp Junction LOS Criteria

Level of Service	Description	Density (pc/mi/ln)[1]		
		Basic	Weaving	Merge/ Diverge
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤ 11	≤ 10	≤ 10
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 to 18	> 10 to 20	> 10 to 20
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 to 26	> 20 to 28	> 20 to 28
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 to 35	> 28 to 35	> 28 to 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 45	> 35 to 43	> 35
F	Represents a breakdown in flow.	> 45	> 43	Demand Exceeds Capacity

Note:
1. Density is presented in passenger cars per mile per lane (pc/mi/ln).
Source: *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016)

Significance Criteria

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by Stanislaus County and the California Department of Transportation.

The impacts of the project are evaluated by comparing the results of the technical analysis under With Project conditions to the results under Existing and Cumulative without Project conditions. The following criteria were used to identify significant off-site intersection impacts of the proposed projects under the various criteria.

According to CEQA guidelines, a traffic increase from a project is considered a significant impact if the associated change to the transportation system with the project would:

- Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) [1];
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

To evaluate potential impacts under Criteria A, the following specific impact criteria were developed based on information from the Stanislaus County General Plan and the Guide for the Preparation of Traffic Studies (Caltrans, 2002).

Stanislaus County

Based on guidance contained in the County of Stanislaus General Plan and recently prepared environmental documents for other projects in the County, a significant transportation-related impact could occur if:

[1] This section of the CEQA Guidelines relates to the evaluation of vehicle miles of travel (VMT). As Stanislaus County has not yet adopted VMT guidelines and compliance with this section of the CEQA guidelines is not required until July 2020, an assessment of VMT was conducted for informational purposes only as presented in Chapter 6.

- Project traffic would result in operations below the acceptable thresholds. For a roadway intersection in Stanislaus County, the project would cause the LOS to degrade to LOS D or worse;
- Project would add traffic to existing roadways/intersections that already exceed the acceptable threshold;

If the intersection is unsignalized, a significant transportation-related impact would occur only if the peak hour signal warrant is met.

California Department of Transportation

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities (Guide for the Preparation of Traffic Studies, Caltrans, December 2002); however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible. A standard of LOS D or better on a peak hour basis was used as the planning objective for the evaluation of potential impacts to Caltrans facilities of this development as that is the standard set for Caltrans facilities in the study area by Stanislaus County. The following criteria were used to evaluate potential impacts to Caltrans facilities:

- If a Caltrans facility is projected to operate at LOS D or better without project and the project is expected to cause the facility to operate at LOS E or worse, the impact may be considered significant.
- If a Caltrans facility is projected to operate at LOS E or F without project and the project increases the traffic volume on the mainline by 5 percent or more, the impact may be considered significant.

Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. In December 2018 the California Natural Resources Agency certified and adopted the CEQA Guidelines update package along with an updated Technical Advisory related to Evaluating Transportation Impacts in CEQA (December 2018). Full compliance with the guidelines is expected by July 2020.

Stanislaus County has not yet adopted significance thresholds related to VMT and VMT analyses are not yet required. Information related to VMT generated by the project is provided for informational purposes only.

EXISTING CONDITIONS

This chapter describes the existing transportation conditions in the study area, including the roadway network and the transit, pedestrian, and bicycle facilities in the vicinity of the project site.

Roadway System

Regional access to the study area is provided by State Route 99 (SR 99), Keyes Road, and Faith Home Road. Local access to the project sites is provided by Golden State Boulevard, 9th Street, and Nunes Road.

SR 99 is a north-south freeway that traverses the central valley of California. SR 99 is classified as a freeway facility in the Stanislaus County General Plan. SR 99 originates south of Bakersfield, branching from Interstate 5, and terminates north of Sacramento prior to the City of Red Bluff. Three mixed-flow lanes are provided in each direction on SR 99 in the vicinity of the project site. The speed limit on the facility is 65 mph.

Keyes Road is an east-west roadway that forms the northern boundary of the ITC Enterprises project site and the southern boundary of the Nunes Road Travel Plaza and Kamir Incorporated project sites. Keyes Road is classified as a principal arterial east of Faith Home Road and as a minor arterial west of Faith Home Road by the Stanislaus County General Plan. Keyes Road is two-lanes in the vicinity of the project site, with a de facto speed limit of 50 mph.

Faith Home Road is a north-south roadway that originates in Merced County and terminates in Ceres prior to the Tuolumne River. Faith Home Road is classified as a principal arterial north of Keyes Road and as a major collector south of Keyes Road by the Stanislaus County General plan. Faith Home Road is two-lanes in the study area, with a de facto speed limit of 50 mph. An extension of Faith Home Road from its current terminus in Ceres to Garner Road across the Tuolumne River is planned.

Golden State Boulevard is a north-south roadway that originates south of Turlock and terminates at Nunes Road just north of the proposed projects; north of Nunes Road, Golden State Boulevard becomes 9th Street. Golden State Boulevard is classified as a minor arterial by the Stanislaus County General Plan. Golden State Boulevard is two-lanes north of Keyes Road and is three-lanes, with one lane in each direction and a two-way-left-turn lane, south

of Keyes Road. Golden State Boulevard provides direct site access to all three proposed projects.

9th Street is a north-south roadway that extends from Nunes Road to Anna Avenue; south of Nunes Road, 9th Street becomes Golden State Boulevard. 9th Street is classified as a local roadway by the Stanislaus County General Plan. 9th Street is two-lanes and has a posted speed limit of 25 mph.

Nunes Road is an east-west two-lane roadway that extends from Keyes Road to Frontage Road. Nunes Road is classified as a major collector by the Stanislaus County General Plan.

Transit Service

Local bus service for the KCP Area is provided by Stanislaus Regional Transit (StaRT). The nearest bus stations to the study area are located on 9th Street/Golden State Boulevard at Nunes Road (bus travels northbound) and at Maud Avenue (bus travels southbound); both stations are served by **Route 15** which travels between Modesto and Turlock. Modesto and Turlock both have airports and regional train stations (Amtrak).

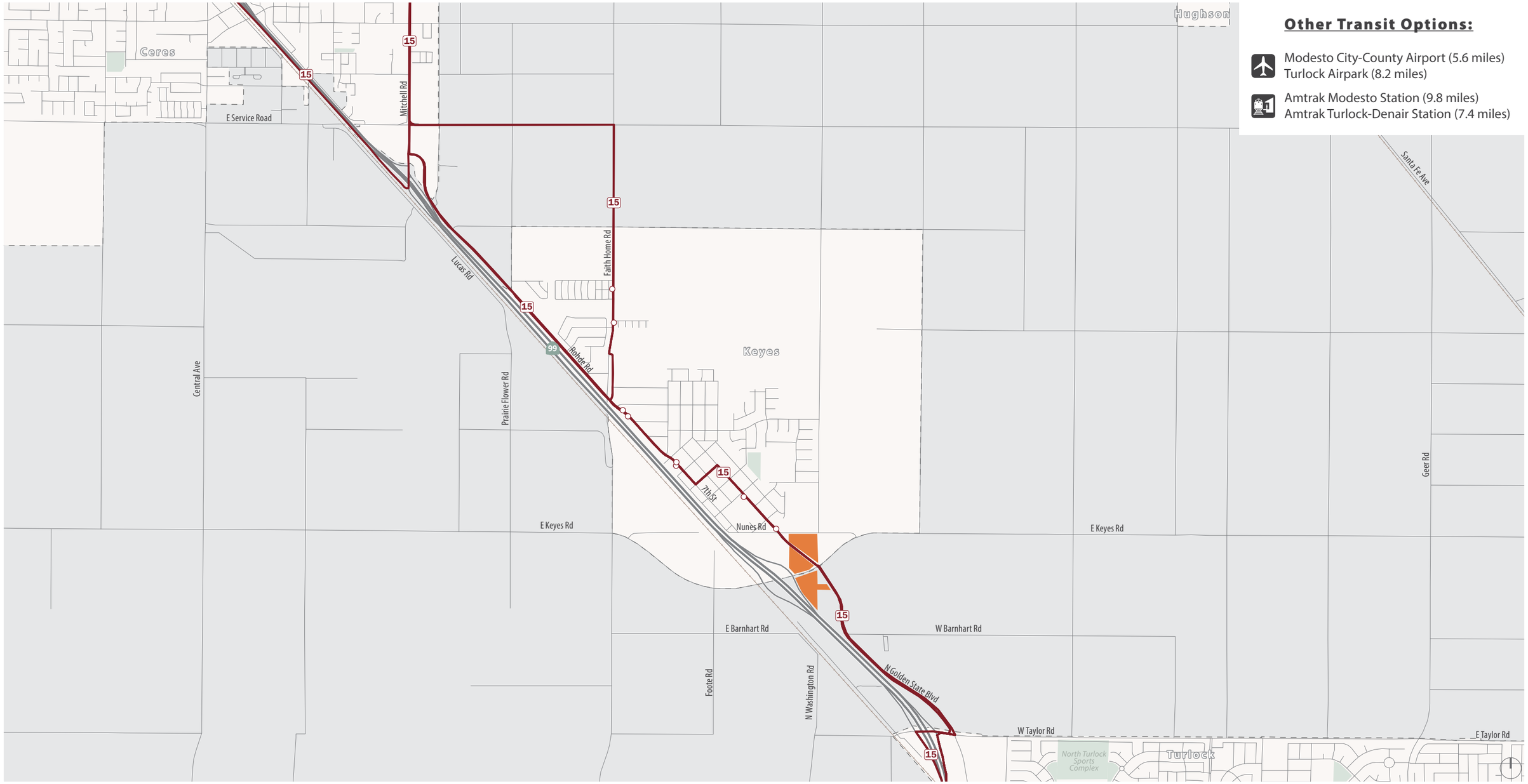
On weekdays Route 15 provides service from 5:50 AM to 9:12 PM with headways ranging from one to two hours. On weekend service is provided from 6:52 AM to 8:20 PM with 105-minute headways. **Figure 3** shows local and regional transit service.

Pedestrian and Bicycle Facilities

Pedestrian facilities include crosswalks, sidewalks, and controlled crossings. In the immediate project vicinity, sidewalks are provided on Golden State Boulevard and 9th Street adjacent to developed parcels. Although there are no sidewalks on Golden State Boulevard at Keyes Road, the intersection features crosswalks on all four approaches and push-activated pedestrian signals.

Bicycle facilities are categorized under four categories:

> *Class I: Shared Use Path* – These facilities are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.
>
> *Class II: Bicycle Lane* – Bicycle lanes provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of five feet wide. Vehicle/pedestrian cross-flow are permitted.



Other Transit Options:

Modesto City-County Airport (5.6 miles)
Turlock Airpark (8.2 miles)

Amtrak Modesto Station (9.8 miles)
Amtrak Turlock-Denair Station (7.4 miles)

Project Sites — Stanislaus Regional Transit (StaRT) Route — StaRT Stop

Figure 3

Local and Regional Transit Service

Class III: Bicycle Route with Sharrows – These bikeways provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include sharrows or "shared-lane markings" to highlight the presence of bicyclists.

Class IV: Buffered Bicycle Lanes – Bicycle lanes that include a physically separated lane for increased comfort and protection of cyclists. Can be physically separated by a barrier, such as planters or on-street parking, grade-separated from the roadway, or a painted buffer area.

There are no formal bicycle facilities in the immediate project vicinity, however the Non-Motorized Transportation Master Plan (StanCOG, 2013) proposes a Class I shared-use path parallel to SR 99 along Golden State Boulevard south of Nunes Road and along the Frontage Road north of Nunes Road, and Class II bicycle lanes on Keyes Road. **Figure 4** shows the existing and proposed bicycle facilities in the study area.

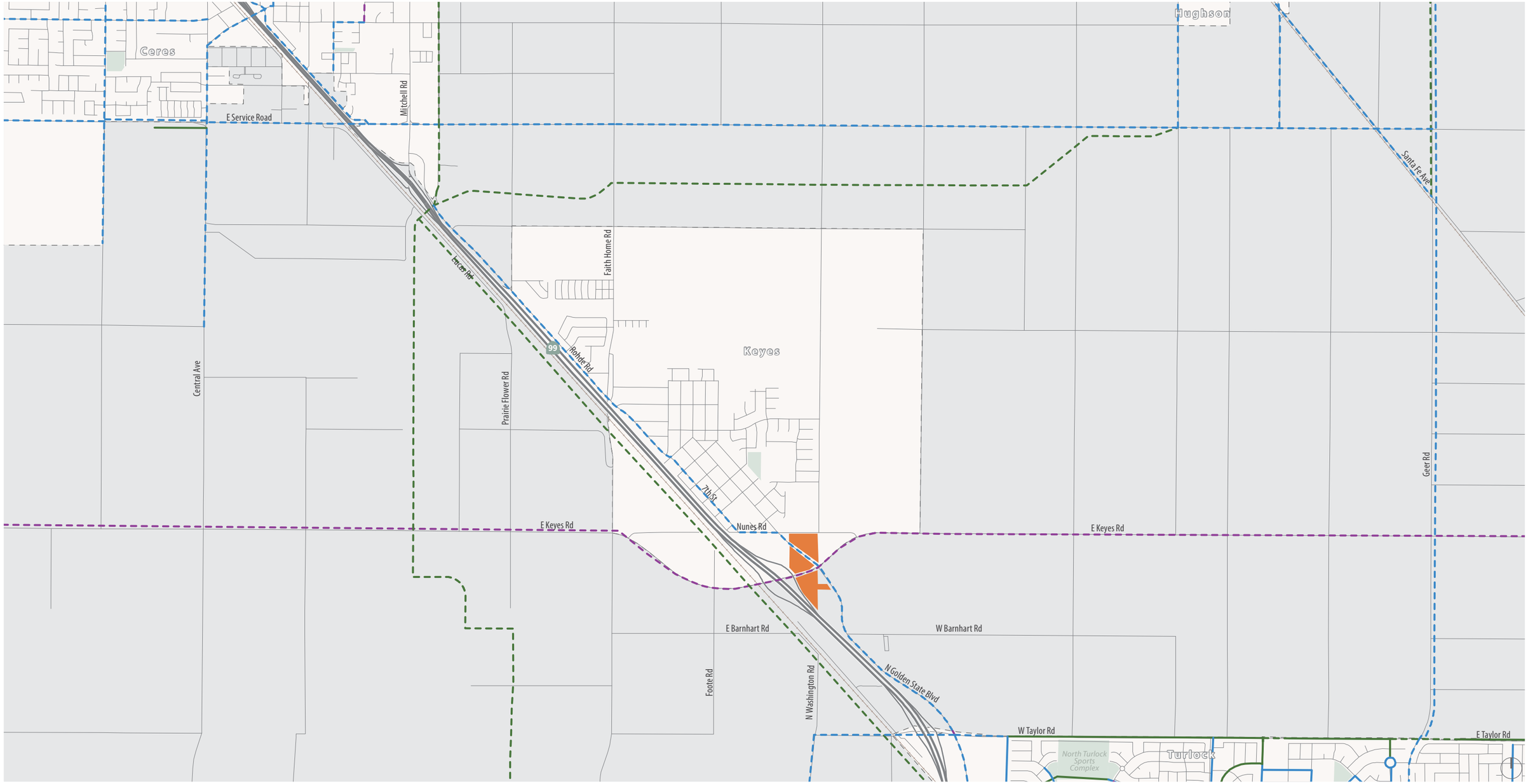


Figure 4

Bicycle Facilities

Existing Operations

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were collected at the nine study intersections in August 2019, including a separate count of vehicles, trucks, pedestrians and bicyclists.

For each study intersection, the sixty-minute period with the highest traffic volumes during the two count periods were identified as the morning (AM) and evening (PM) peak hours of traffic. The peak hour volumes are presented on **Figure 5**, along with the existing lane configuration and traffic control. Existing bicycle and pedestrian volumes are shown on **Figure 6**. Traffic count worksheets are provided in **Appendix A**.

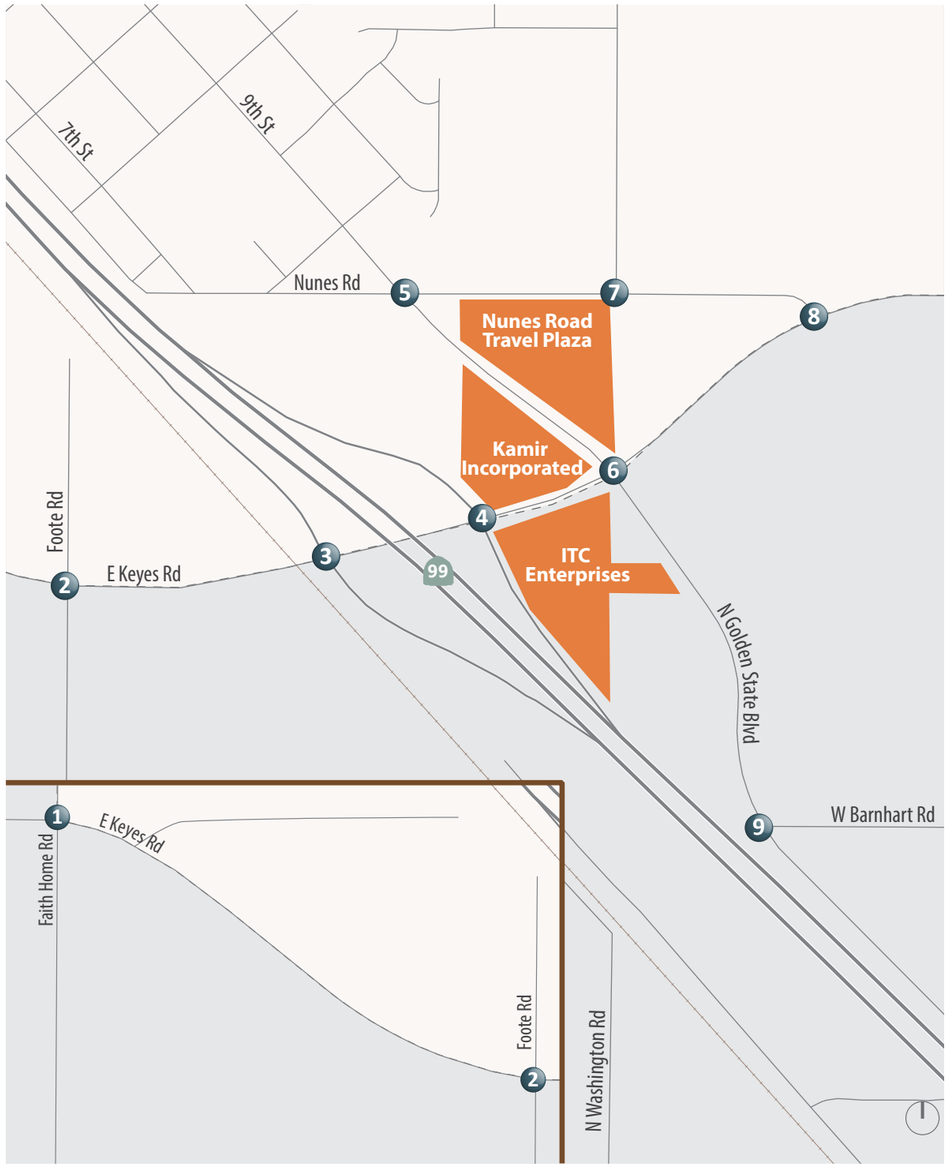
Intersection Operations

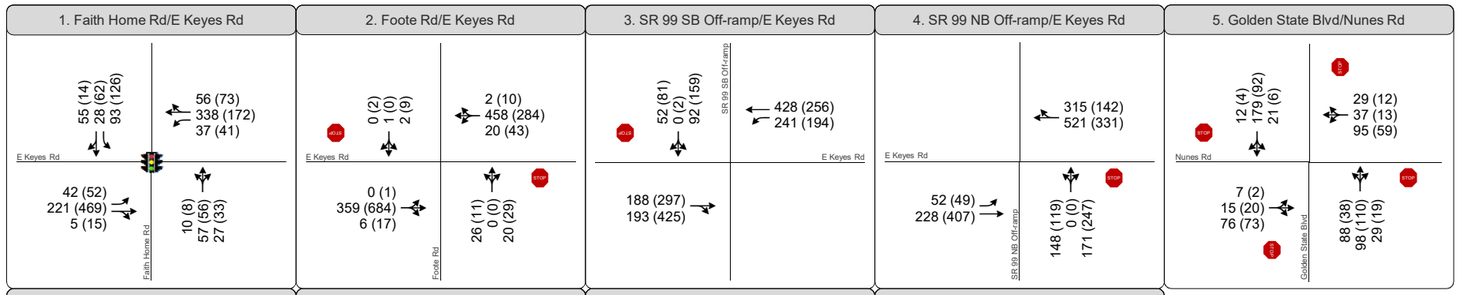
Existing intersection operations were evaluated using the HCM 6th Edition methodology with the results summarized in **Table 3**. Observed peak hour factors were used at all intersections, and truck, pedestrian and bicycle activity were factored into the analysis.

Most study intersections operate at overall acceptable service levels in accordance with benchmarks set by Stanislaus County during both the weekday morning and evening peak hours, which was confirmed during field observations. The following intersections operate below the LOS standard:

- The southbound approach at the intersections of Keyes Road at Foote Road (Intersection 2) experiences LOS D operations during the morning and evening peak hours but *does not meet peak hour signal warrants* due to low minor street roadway volumes.
- The southbound approach at the intersections of Keyes Road at SR 99 Southbound Off-ramp (Intersection 3) experiences LOS F operations during the morning and evening peak hours and *meets peak hour signal warrants*.
- The northbound approach at the intersections of Keyes Road at SR 99 Northbound Off-ramp (Intersection 4) experiences LOS F operations during the morning and evening peak hours and *meets peak hour signal warrants*.

Intersection LOS worksheets from Synchro 10 are provided in **Appendix B**. Peak hour signal warrants are provided in **Appendix C**.





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

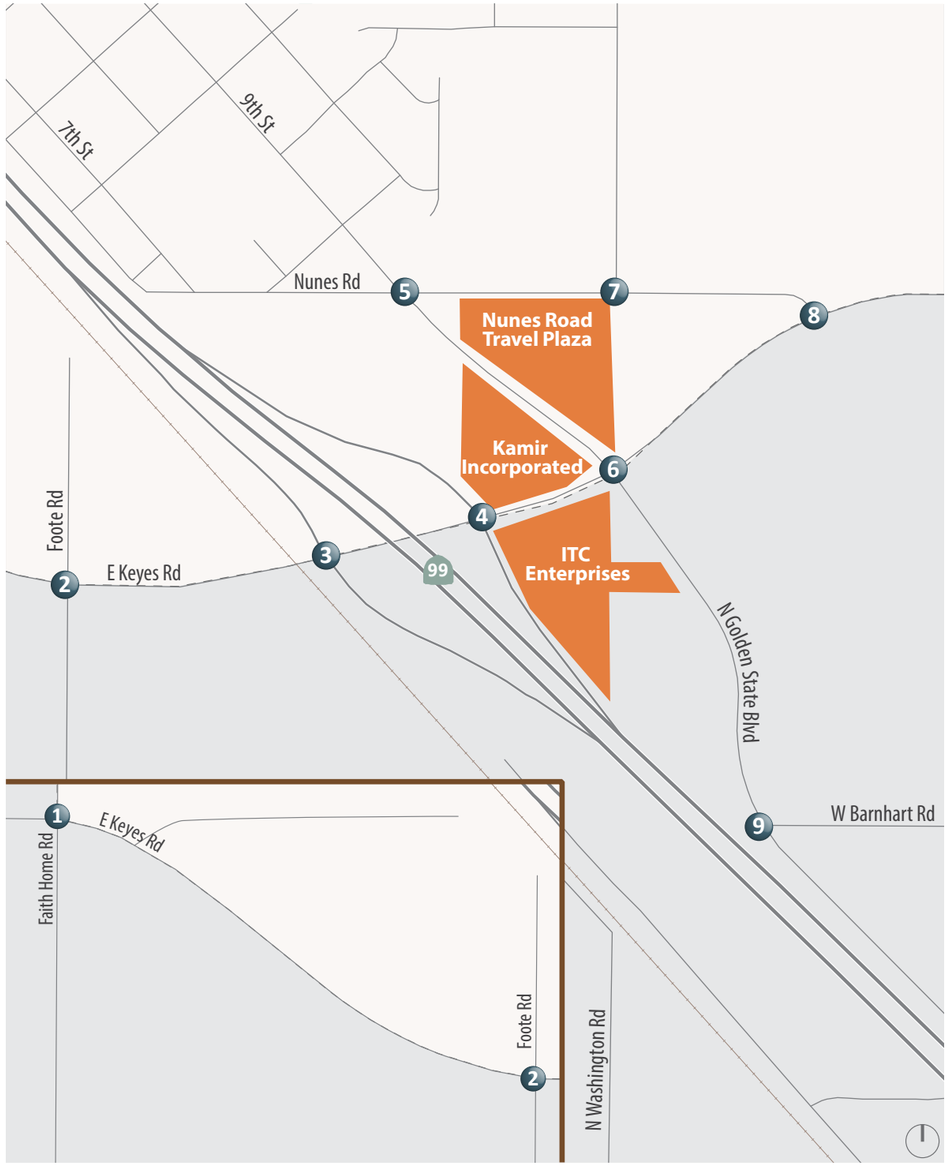
Stop Sign

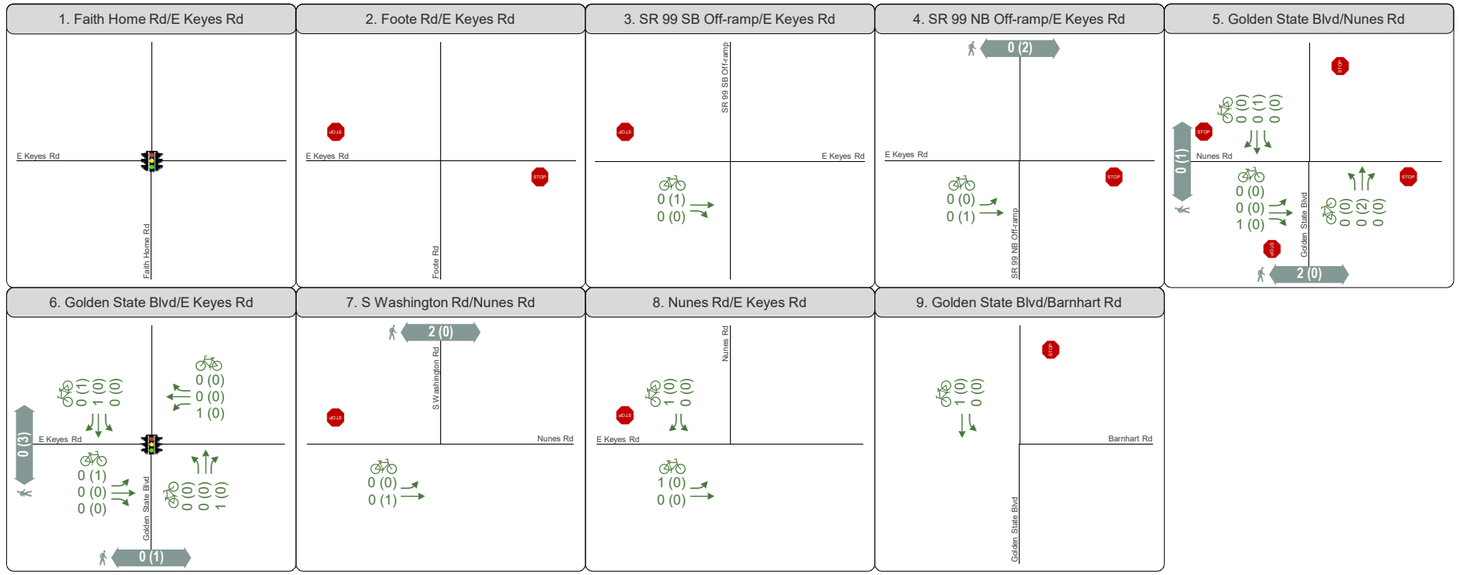
Project Sites

Study Intersection

Figure 5

Existing Conditions Peak Hour Traffic Volumes





0 (0) AM (PM) Peak Hour Pedestrian Volumes

0 (0) AM (PM) Peak Hour Bicycle Volumes

Signalized Intersection

Stop Sign

Project Sites

Study Intersection

Figure 6

Existing Conditions Peak Hour Bicycle and Pedestrian Volumes

Table 3: Existing Conditions - Intersection Levels of Service						
	Intersection	Control[1]	Peak Hour	Existing Conditions		
				Delay[2]	LOS	Meets Signal Warrant?
1	Faith Home Road at Keyes Road	Signalized	AM PM	12 13	B B	--
2	Foote Road at Keyes Road	SSSC	AM PM	1 **(27)** 1 **(26)**	A **(D)** A **(D)**	No
3	State Route 99 Southbound Ramps at Keyes Road	SSSC	AM PM	14 **(>99)** **46 (>99)**	B **(F)** **E (F)**	**Yes**
4	State Route 99 Northbound Ramps at Keyes Road	SSSC	AM PM	16 **(70)** 15 **(52)**	C **(F)** C **(F)**	**Yes**
5	9th Street/Golden State Boulevard at Nunes Road	AWSC	AM PM	11 8	B A	No
6	Golden State Boulevard at Keyes Road	Signalized	AM PM	25 20	C C	--
7	South Washington at Nunes Road	SSSC	AM PM	6 (11) 5 (10)	A (B) A (A)	No
8	Nunes Road at Keyes Road	SSSC	AM PM	2 (12) 2 (12)	A (B) A (B)	No
9	Golden State Boulevard at Barnhart Road	SSSC	AM PM	1 (12) 1 (11)	A (B) A (B)	No

Notes:
1. AWSC = All-way Stop Control; SSSC = Side-street Stop Control
2. Average control delay expressed in seconds per vehicle. For side-street stop-controlled intersections, delay for the worst movement is expressed in parenthesis, with average intersection delay and LOS presented outside the parenthesis.

Bold indicates unacceptable intersection operations.
Source: Fehr & Peers, 2019.

Freeway Operations

Existing freeway volumes were obtained through traffic counts collected on March 2017 and adjusted assuming a two percent growth rate per year for the year 2019 based on a comparison of traffic counts at other locations in the area between 2017 and 2019. Existing freeway operations were evaluated using the HCM 6th Edition methodology with the results summarized in **Table 4**. Detailed calculation sheets are presented in **Appendix D.**

During the weekday morning, Northbound SR 99 at Keyes Road Off-ramp operates at LOS E. During the weekday evening peak hour, Southbound SR 99 segments within the study area operate at LOS E or F. All other freeway segments operate at acceptable service levels.

Table 4: Existing Conditions – Freeway Segment Levels of Service					
	Segment	Type	Peak Hour	Existing Conditions	
				Density[1] (pc/mi/ln)	LOS
Northbound SR 99					
1	Keyes Rd Off-ramp	Diverge	AM PM	**35.3** 31.7	**E** D
2	Between Keyes Rd Off-ramp and On-ramp	Basic	AM PM	30.5 24.5	D C
3	Keyes Rd On-ramp	Merge	AM PM	31.5 25.6	D C
Southbound SR 99					
1	Keyes Rd Off-ramp	Diverge	AM PM	30.6 **38.9**	D **E**
2	Between Keyes Rd Off-ramp and On-ramp	Basic	AM PM	25.3 **38.8**	C **E**
3	Keyes Rd On-ramp	Merge	AM PM	28.4 **37.2**	D **F**

Notes:
1. Density is presented in passenger cars per mile per lane (pc/mi/ln).
Bold indicates unacceptable freeway segment operations.
Source: Fehr & Peers, 2019.

PROJECT CHARACTERISTICS

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, trip distribution, and trip assignment characteristics. These items allow for an evaluation of project impacts on the surrounding roadway network. The amount of project traffic estimated to be added to the transportation system after completion of the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the area was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements based on likely paths of travel.

Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. For this project, estimates of weekday morning and evening peak hour trip generation were developed to coincide with the morning and evenings levels of peak activity when traffic flows on SR 99 are the highest, in addition to an estimate of daily weekday traffic volumes.

For the ITC Enterprises development, trip generation was estimated using local driveway counts at the existing Peterbilt development, located directly adjacent to the proposed ITC Enterprises development. A local trip rate specific to truck leasing/rental/service facilities was developed using the driveway counts. When compared to standard rates from the *Trip Generation Manual*, *10th Edition* (Institute of Transportation Engineers (ITE), 2017) for General Light Industrial, the local trip rate is higher for both the AM and PM peak hours.

For the Nunes Road Travel Plaza and Kamir Incorporated developments, trip generation was estimated using standard rates from the *Trip Generation Manual*, *10th Edition* for the various project components. The resulting vehicle trip generation estimates, which consider internalized, pass-by, and diverted trips, are presented in **Table 5**.

Table 5: Trip Generation								
Land-Use	**Size**	**Daily**	**AM Peak Hour**			**PM Peak Hour**		
			In	**Out**	**Total**	**In**	**Out**	**Total**
ITC Enterprises								
Truck Lease/ Rental Facility[1]	35,000 sq. ft.	430	27	13	40	10	33	43
Total Net New Trips		**430**	**27**	**13**	**40**	**10**	**33**	**43**
Nunes Road Travel Plaza								
Convenience Market/ Gas Station[2]	21 vehicle fueling stations	4,800	295	295	590	241	241	482
Pass-by Trips (60%)		(-2,880)	(-177)	(-177)	(-354)	(-145)	(-145)	(-290)
Diverted Trips (20% AM/30% PM & Daily)		(-1,440)	(-59)	(-59)	(-118)	(-72)	(-72)	(-144)
Fast Food Restaurant with Drive Thru[3]	4,278 sq. ft.	2,000	88	84	172	73	67	140
Pass-by Trips (50%)		(-1,000)	(-44)	(-42)	(-86)	(-37)	(-34)	(-71)
Diverted Trips (25%)		(-500)	(-22)	(-21)	(-43)	(-18)	(-17)	(-35)
Total Net New Trips		**980**	**81**	**80**	**161**	**42**	**40**	**82**
Kamir Incorporated								
Convenience Market/ Gas Station[2]	12 vehicle fueling stations	2,800	168	169	337	138	138	276
Pass-by Trips (60%)		(-1680)	(-101)	(-101)	(-202)	(-83)	(-83)	(-166)
Diverted Trips (20% AM/30% PM & Daily)		(-840)	(-34)	(-34)	(-68)	(-41)	(-41)	(-82)
Fast Food Restaurant with Drive Thru[3]	6,000 sq. ft.	2,800	123	118	241	102	94	196
Pass-by Trips (50%)		(-1400)	(-62)	(-59)	(-121)	(-51)	(-47)	(-98)
Diverted Trips (25%)		(-700)	(-31)	(-30)	(-61)	(-26)	(-24)	(-50)
Fast Food Restaurant without Drive Thru[4]	2,000 sq. ft.	700	30	20	50	28	29	57
Pass-by Trips (50%)		(-350)	(-15)	(-10)	(-25)	(-14)	(-15)	(-29)
Diverted Trips (25%)		(-180)	(-8)	(-5)	(-13)	(-7)	(-7)	(-14)
Total Net New Trips		**1,150**	**70**	**68**	**138**	**46**	**44**	**90**

Notes:
1. Based on trip generation rate observed at Peterbilt Development:
   AM = 1.14 * X (68% In, 32% Out); PM = 1.24 * X (24% In, 76% Out); Daily = 10 * PM; X = 1,000 square feet
2. Based on trip generation rates for land use 960, Super Convenience Market/Gas Station
3. Based on trip generation rates for land use 934, Fast Food Restaurant with Drive Thru
4. Based on trip generation rates for land use 933, Fast Food Restaurant without Drive Thru

Source: *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, 2017); Fehr & Peers, 2019.

Internalized Trips

Internalized trips are a subcategory of trips where both the trip origin and trip destination are contained within the same development; these are trips that have multiple destinations within the same development. For example, at the Nunes Road Travel Plaza a patron might stop for fuel at the gas station and then wash their truck at the truck wash. Since ITE trip generation data generally represents trip generation at a single land-use, an internalization factor should be considered at developments with multiple land-uses.

For this assessment it was assumed that trips to or from the truck wash and repair area at the Nunes Road Travel Plaza would be internalized trips from the gas/service station and/or convenience market; under this assumption trip generation for the truck wash and repair area was not calculated. No internalized trips between the gas station/convenience market and the fast food restaurant(s) were assumed.

Pass-By and Diverted Trips

Driveway traffic at the proposed developments is comprised of: (1) new traffic generated by the project, (2) traffic that would otherwise already be on the adjacent roadways but the driver decides to stop at the site (e.g., to purchase an item on their way home from work), and (3) traffic on other nearby roadways, but the driver decides to take a short detour to stop at the site (e.g., to exit off the freeway for gas). The trips in Item 2 are referred to as "pass-by" trips and the trips in Item 3 are referred to as "diverted-link" trips.

Information contained in the *Trip Generation Handbook, 3rd Edition* (ITE, 2017) and surveys of similar uses was used to estimate pass-by trips.

- Fast-food restaurants with drive thru windows have an average pass-by trip rate of approximately 50 percent, and an average diverted trip rate of approximately 25 percent during both the morning (AM) and evening (PM) peak hours;
- Gas/service stations with convenience markets have an average pass-by trip rate of approximately 60 percent during the AM and PM peak hours, and an average diverted trip rate of approximately 20 percent during the AM peak hour and 30 percent during the PM peak hour.

In other words, at a typical gas station, up to 90 percent of the traffic entering and exiting the site during the PM peak hour is already on the surrounding roadway system. For this assessment, it was assumed that pass-by/diverted trips for the fast-food restaurants (with

or without a drive thru window) would comprise 75 percent of the trip generation, and that pass-by/diverted trips for the gas/service stations with convenience markets would comprise 80 to 90 percent of the trip generation. While pass-by and diverted trips are not new vehicle trips to the overall roadway system, they are accounted for in the analysis of driveway operations. Diverted trips are accounted for along the route of diversion. For example, a trip from SR 99 would be a new trip through the interchange and on surface streets for both the trip to and from the freeway, but the trip would not be a new trip on SR 99.

Trip Distribution & Assignment

Trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Due to the high percentage of pass-by and diverging trips, the project trip distribution of the proposed projects was estimated using existing travel patterns on the roadway network based on the area traffic counts. The trip distribution for the proposed projects are presented on **Figure 7**.

Trip assignment refers to the specific route and roadway segments vehicles would take to access and leave the site. Trips to project sites were assigned to the roadway network using the trip distribution percentages on Figure 7. Pass-by/diverted trip percentages were further refined using pass-by rates found in the Trip Generation Manual. Since the project driveways are located on a minor street (Golden State Boulevard), as opposed to one with more pass-by traffic, survey data from the Trip Generation Handbook overestimated the percentage of pass-by trips; overestimated pass-by trips were converted to diverted trips. The final project trip assignment for ITC Enterprises, Nunes Road Travel Plaza, Kamir Incorporated, and all three developments combined are presented on **Figures 8A-D**.

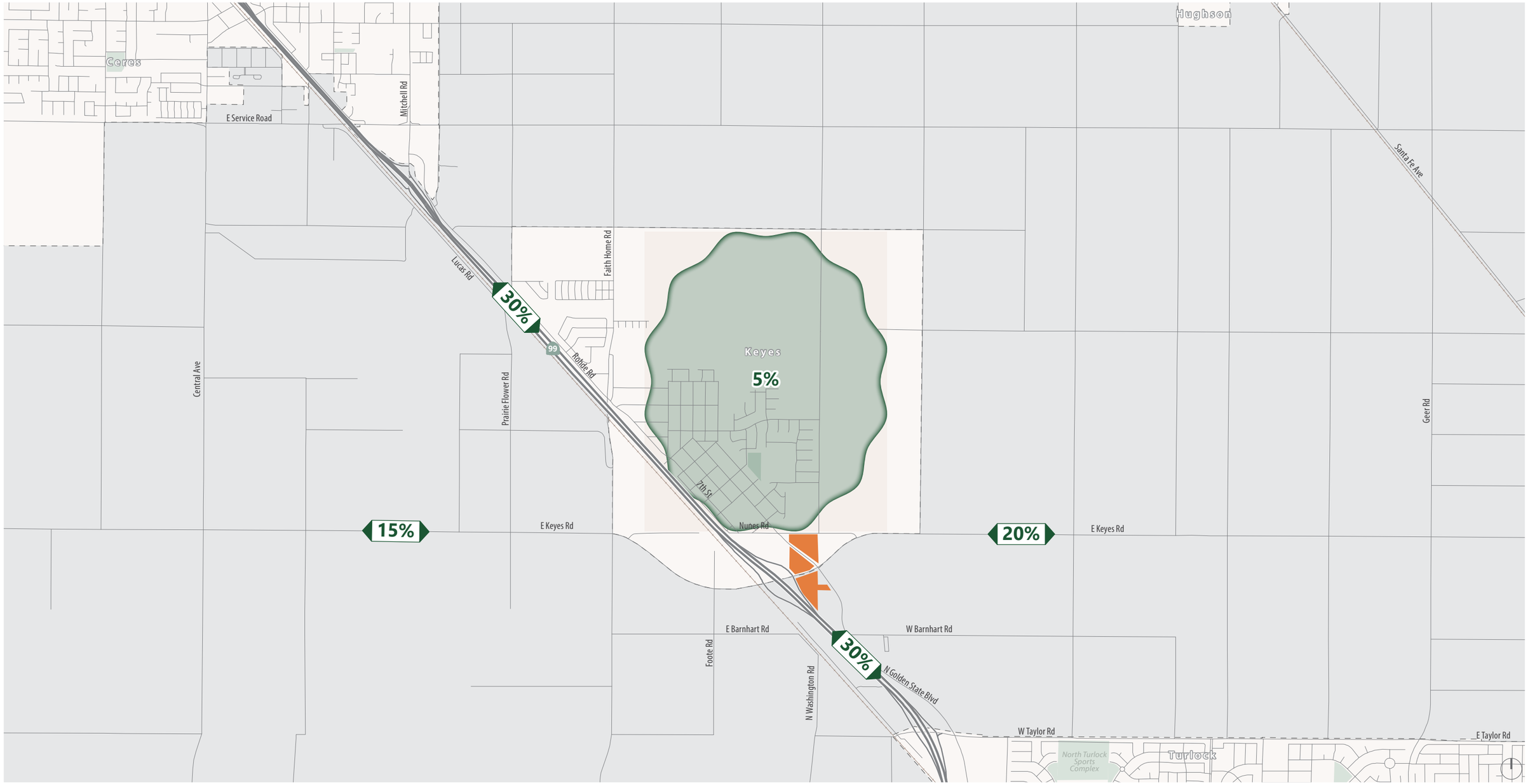
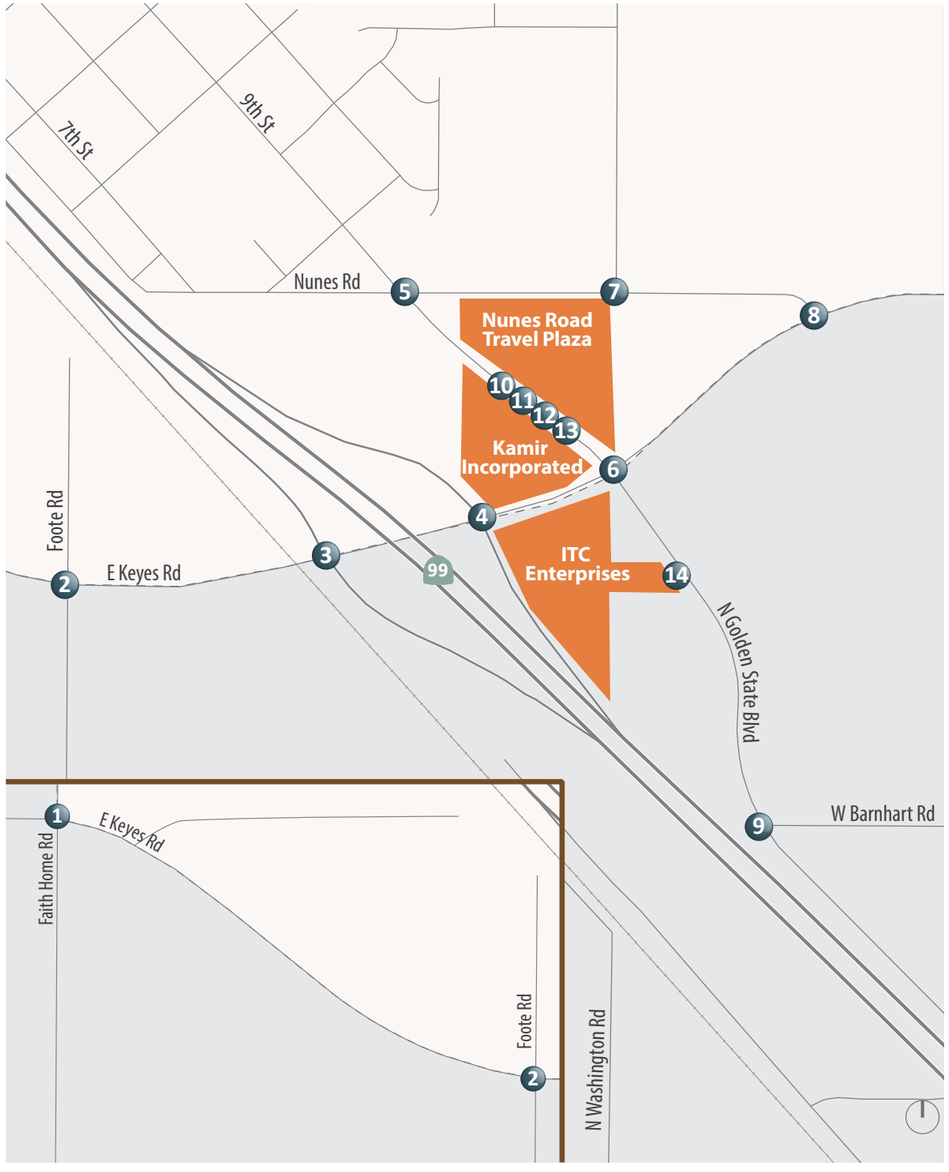


Figure 7

Project Trip Distribution

WC19-3625_7_TTripDistro



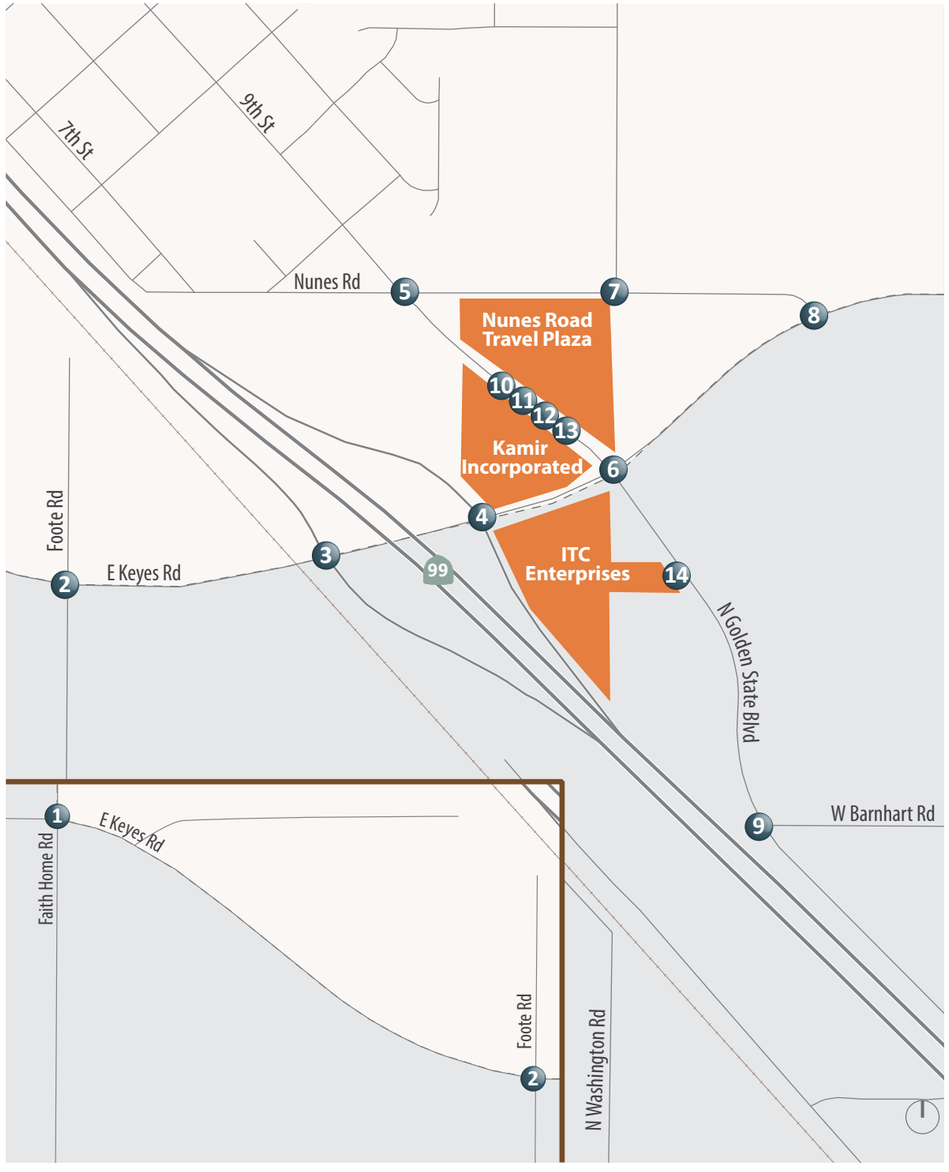


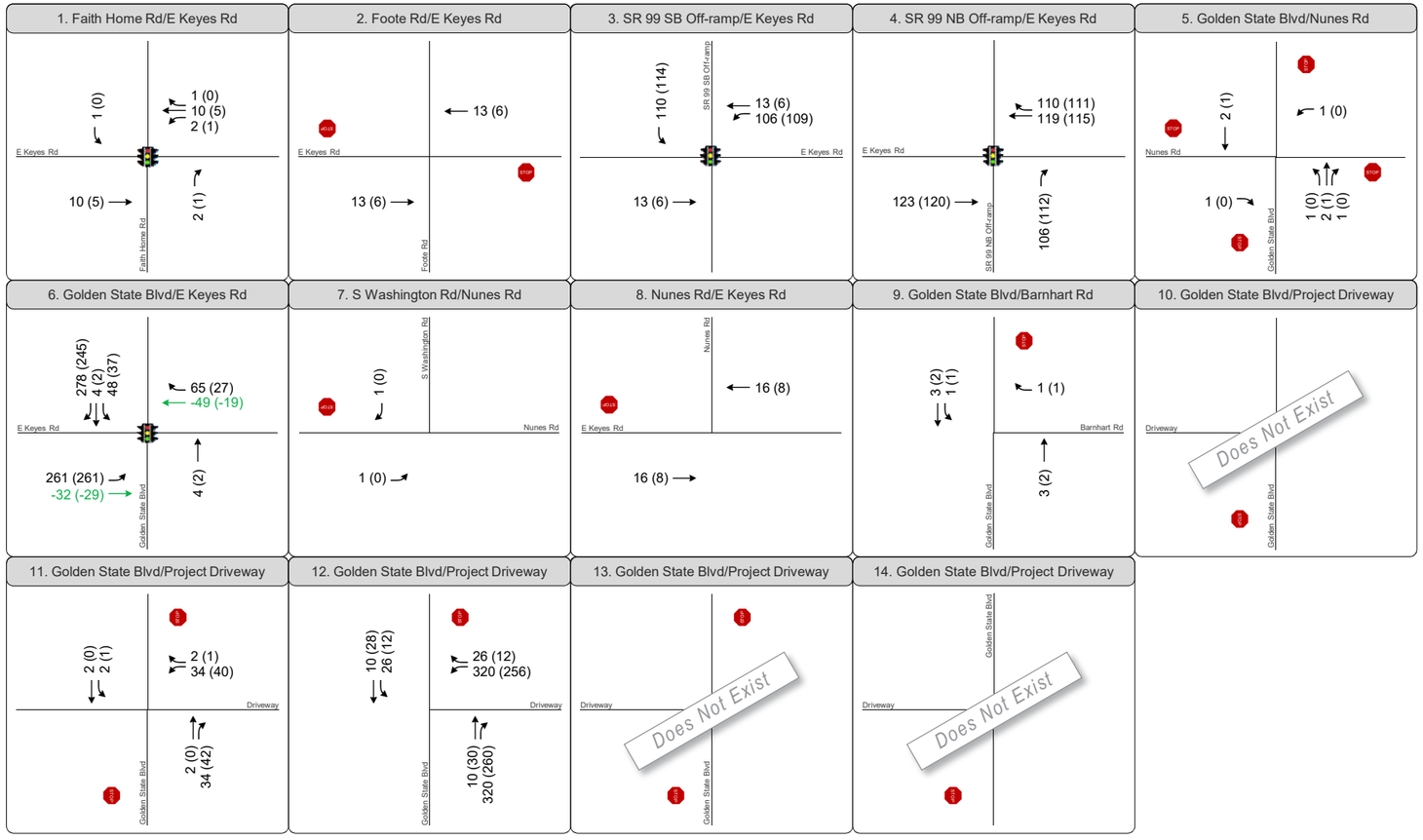
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Sites # Study Intersection

Figure 8A

Project Trip Assignment — ITC Enterprises





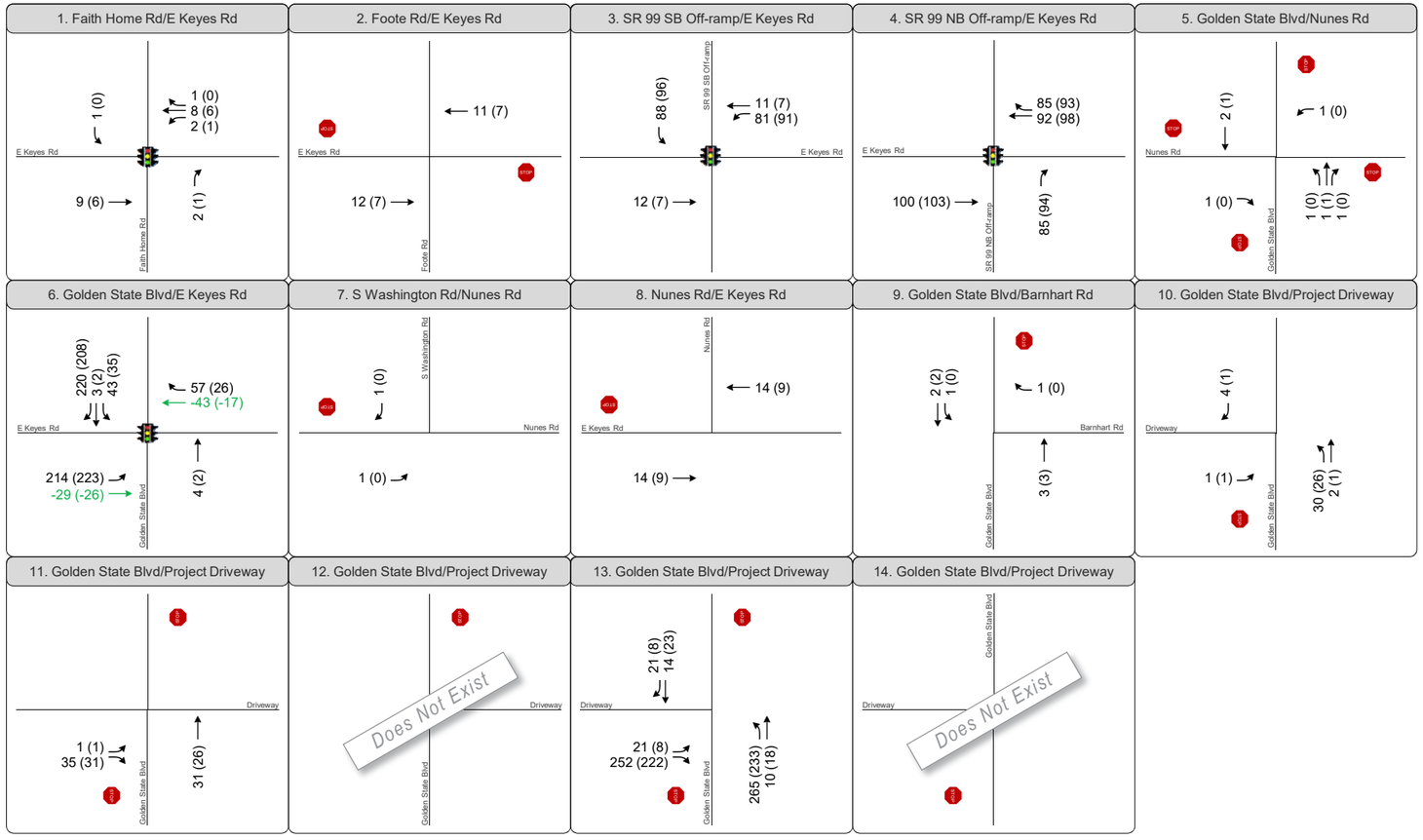
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Sites # Study Intersection

Figure 8B

Project Trip Assignment — Nunes Road Travel Plaza





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

STOP Stop Sign

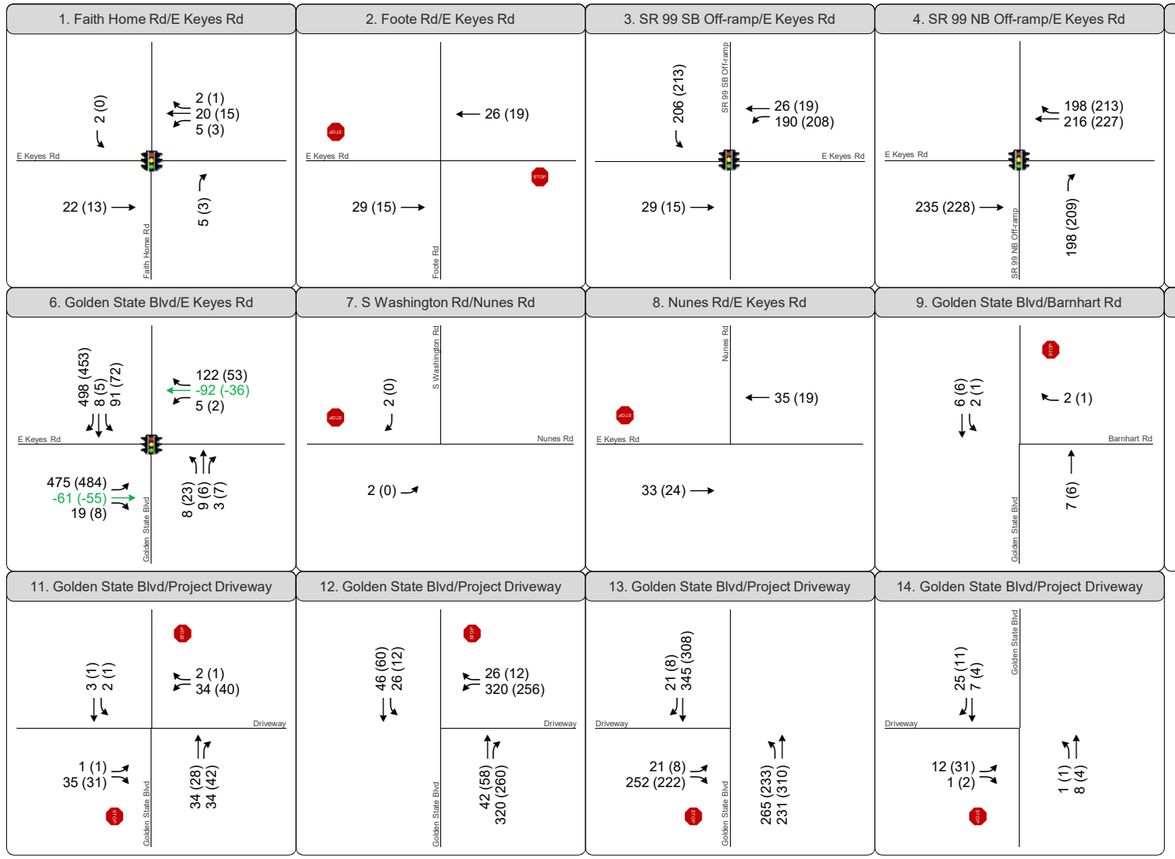
Project Sites

Study Intersection

Figure 8C

Project Trip Assignment — Kamir Incorporated





XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Sites | # Study Intersection

Figure 8D

Project Trip Assignment — Project Trips Combined

EXISTING WITH PROJECT CONDITIONS

This chapter evaluates potential off-site traffic impacts under Existing with Project Conditions. Project-only traffic volumes (Figures 8A-D) were added to the existing peak hour traffic volumes (Figure 5) to estimate Existing with Project peak hour intersection turning movement volumes, as shown on **Figures 9A-D**.

Stanislaus County plans to signalize the SR 99/Keyes Road Interchange prior to the completion of the projects, therefore the existing with project scenarios assume that the intersections of Keyes Road at the Northbound SR 99 Off-ramp and at the Southbound SR 99 Off-ramp are coordinated signals with protected left-turn movements; no geometric improvements were assumed. Peak hour factors and all other parameters at the study intersections were left unchanged from existing conditions. No other roadway improvements where assumed.

Existing with Project Intersection Operations

Intersection operations were evaluated using the HCM 6th Edition methodology with Existing with Project results summarized in **Table 6**. Intersection LOS worksheets from Synchro 10 are provided in **Appendix B**. Peak hour signal warrants are provided in **Appendix C**.

Project impacts were determined by comparing with Project intersection operations to without Project intersection operations. To determine impacts of project traffic at the SR 99/Keyes Road Interchange (Intersections 3 and 4), which will be signalized in the Existing with Project scenarios, signalized intersection operations at the SR 99/Keyes Road Interchange were evaluated with Existing without Project traffic volumes as a point of direct comparison.

The addition of ITC Enterprises project traffic to existing roadway volumes would not degrade any intersections to LOS D or worse.

The addition of Nunes Road Travel Plaza project traffic to existing roadway volumes would degrade the following intersection(s) to LOS D or worse:

- Intersection 3: SR 99 Southbound Ramps at Keyes Road (LOS E, PM peak hour);

- Intersection 4: SR 99 Northbound Ramps at Keyes Road (LOS E and D, AM and PM peak hours);
- Intersection 6: Golden State Boulevard at Keyes Road (LOS F, AM peak hour); and
- Intersection 12: NRTP (South) Project Driveway at Golden State Boulevard (LOS F and D with peak hour signal warrant met, AM and PM peak hours).

The addition of Kamir Incorporated project traffic to existing roadway volumes would degrade the following intersection(s) to LOS D or worse:

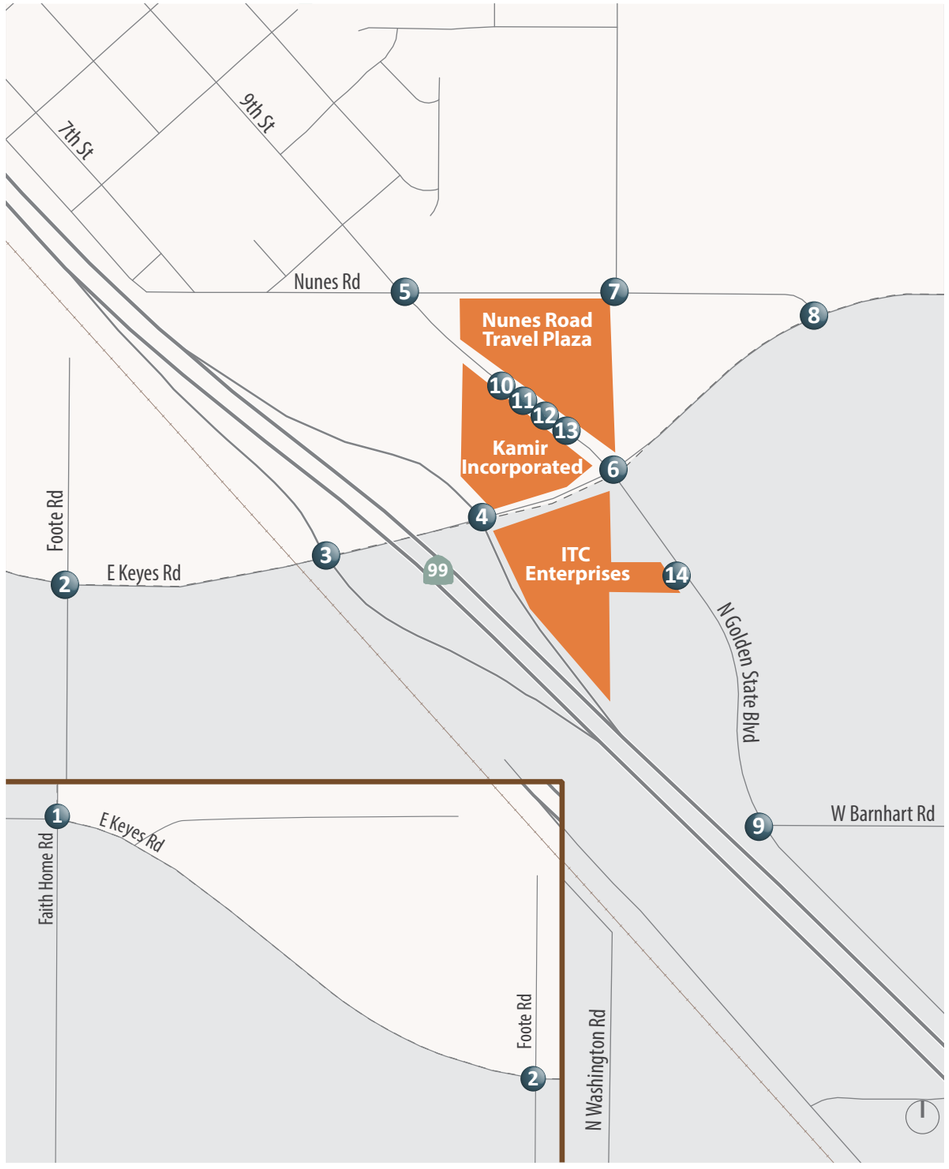
- Intersection 3: SR 99 Southbound Ramps at Keyes Road (LOS E, PM peak hour);
- Intersection 4: SR 99 Northbound Ramps at Keyes Road (LOS E, AM peak hour); and
- Intersection 6: Golden State Boulevard at Keyes Road (LOS F, AM peak hour).

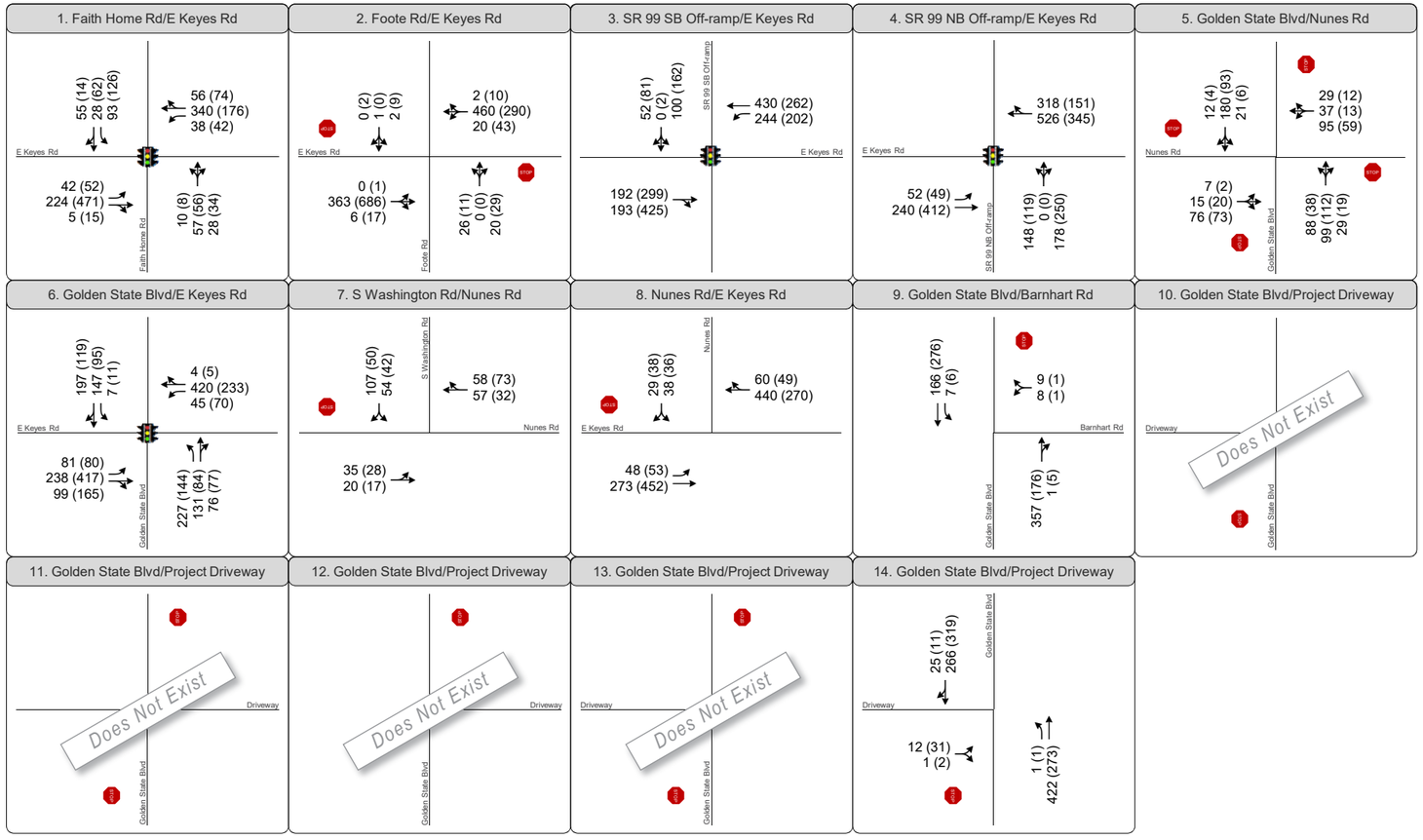
The addition of project traffic from ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated (Project Trips Combined) to existing roadway volumes would degrade the following intersection(s) to LOS D or worse:

- Intersection 3: SR 99 Southbound Ramps at Keyes Road (LOS E, PM peak hour);
- Intersection 4: SR 99 Northbound Ramps at Keyes Road (LOS F and E, AM and PM peak hours);
- Intersection 6: Golden State Boulevard at Keyes Road (LOS F and F, AM and PM peak hours);
- Intersection 12: NRTP (South) Project Driveway at Golden State Boulevard (LOS F and E with peak hour signal warrant met, AM and PM peak hours); and
- Intersection 13: KI (South) Project Driveway at Golden State Boulevard (LOS F peak hour signal warrant met, AM peak hour).

Operations of the side-street movement on Foote Road at Keyes Road (Intersection 2) in the AM and PM peak hours would remain at LOS D with the addition of project traffic in all the Existing with Project scenarios. This intersection does not meet peak hour signal warrants under any of the Existing with Project scenarios.

All other study intersections would continue to operate at LOS C or better with the addition of project traffic in all Existing with Project scenarios.





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

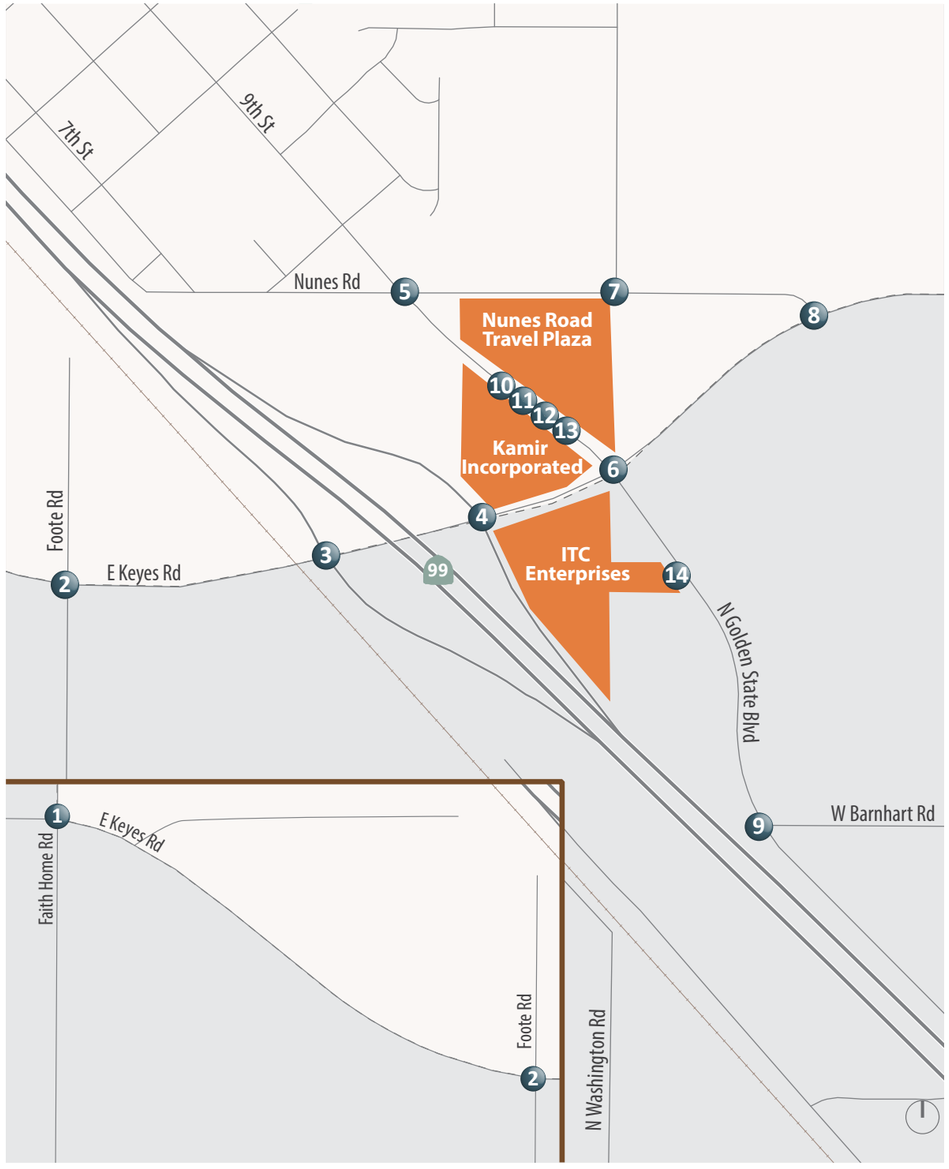
STOP Stop Sign

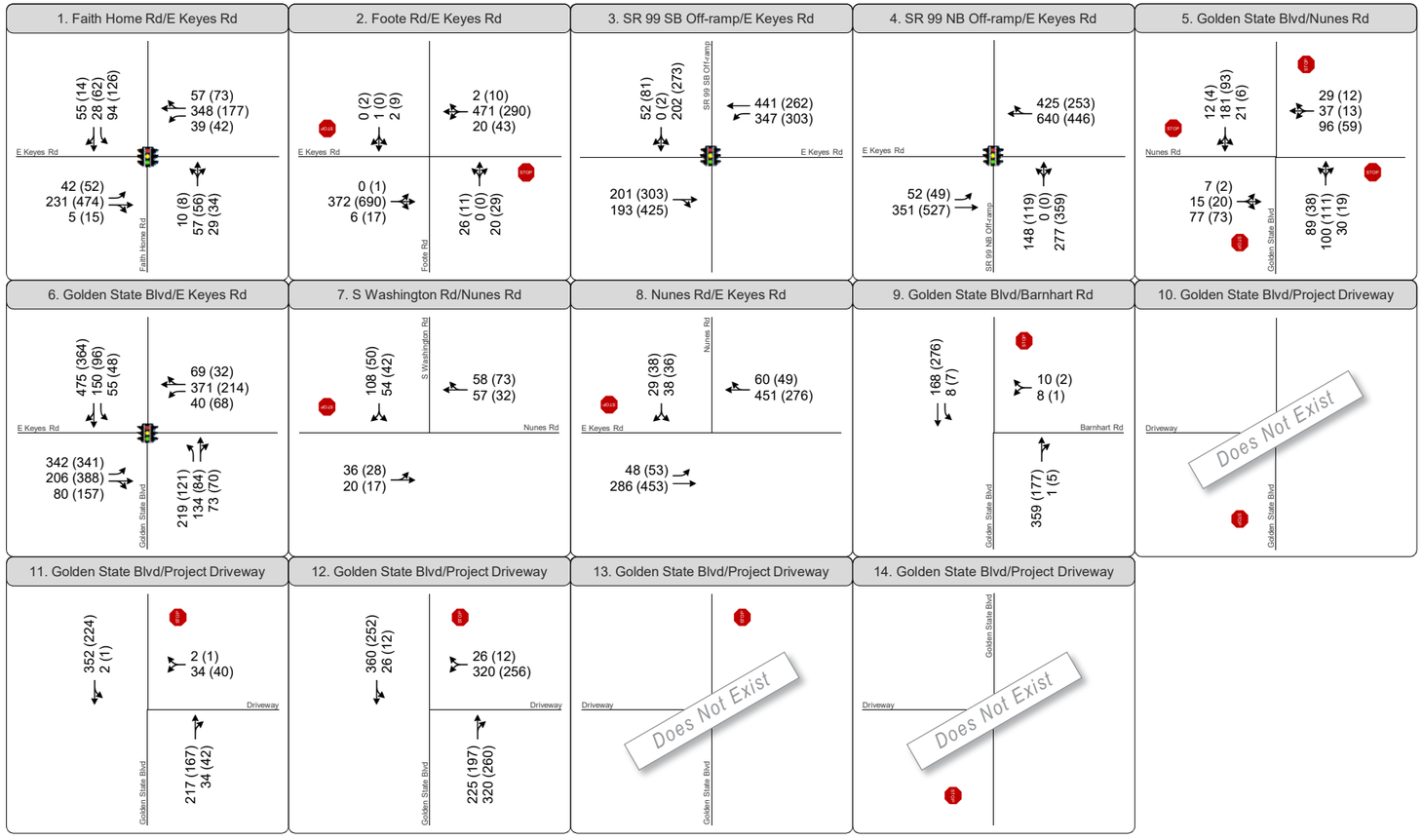
Project Sites

Study Intersection

Figure 9A

Existing with ITC Enterprises Peak Hour Traffic Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

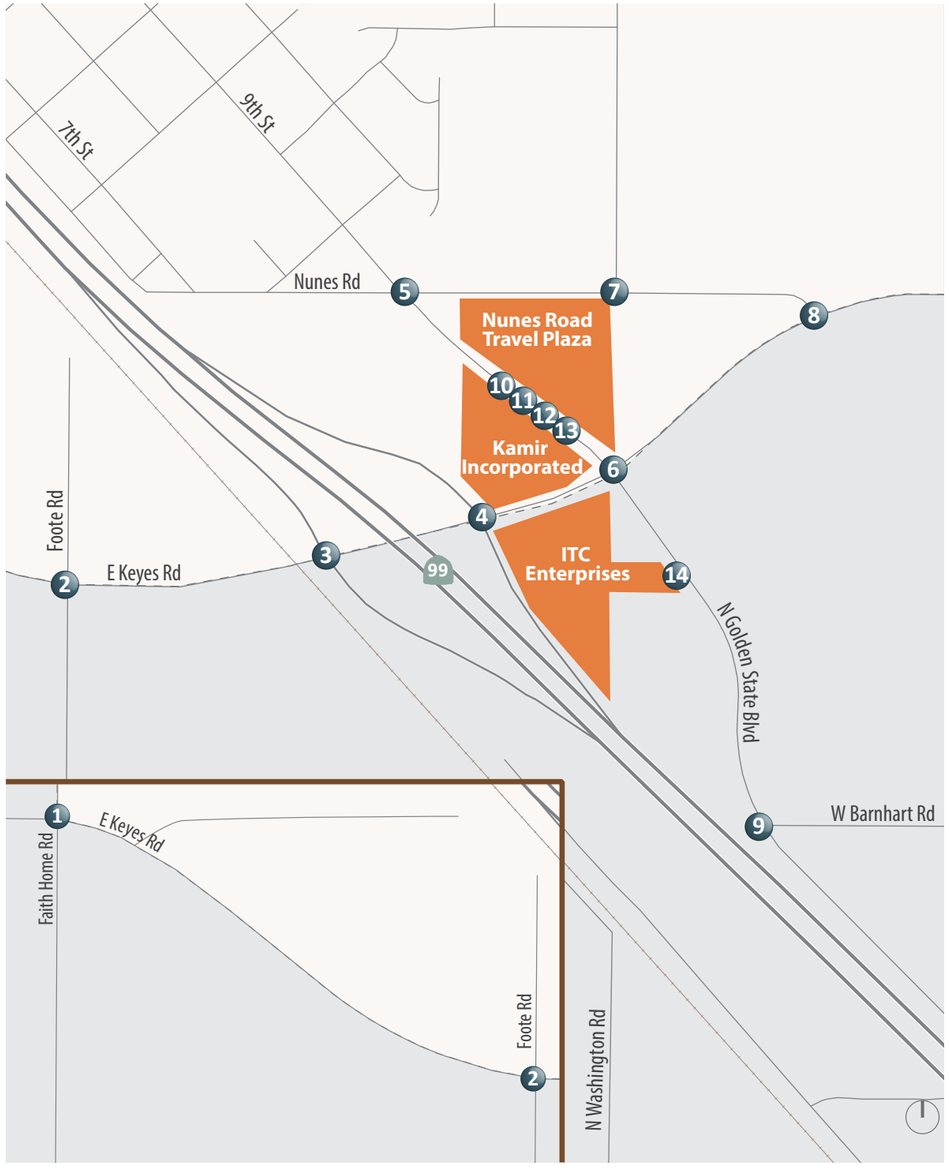
Stop Sign

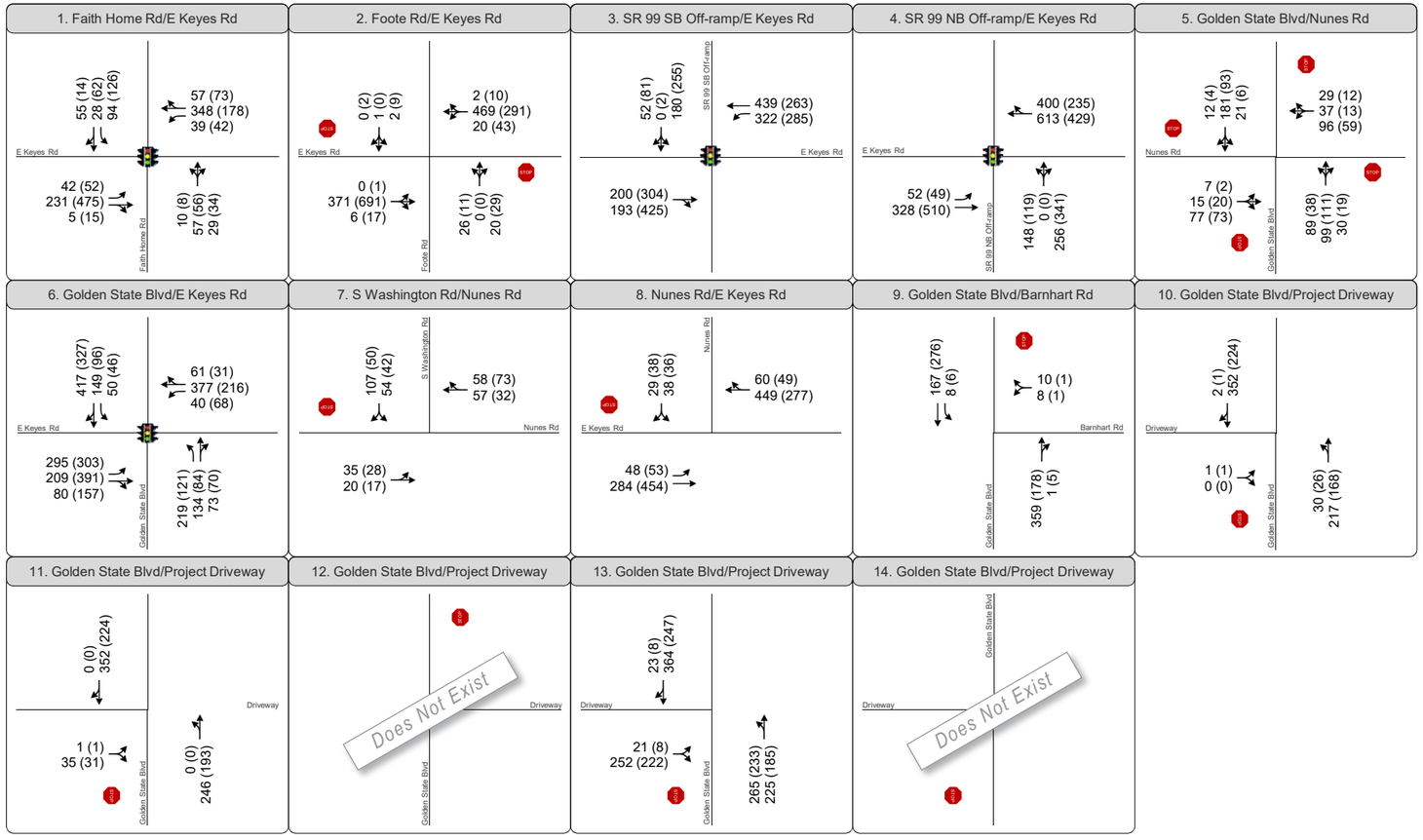
Project Sites

Study Intersection

Figure 9B

Existing with Nunes Road Travel Plaza Peak Hour Traffic Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

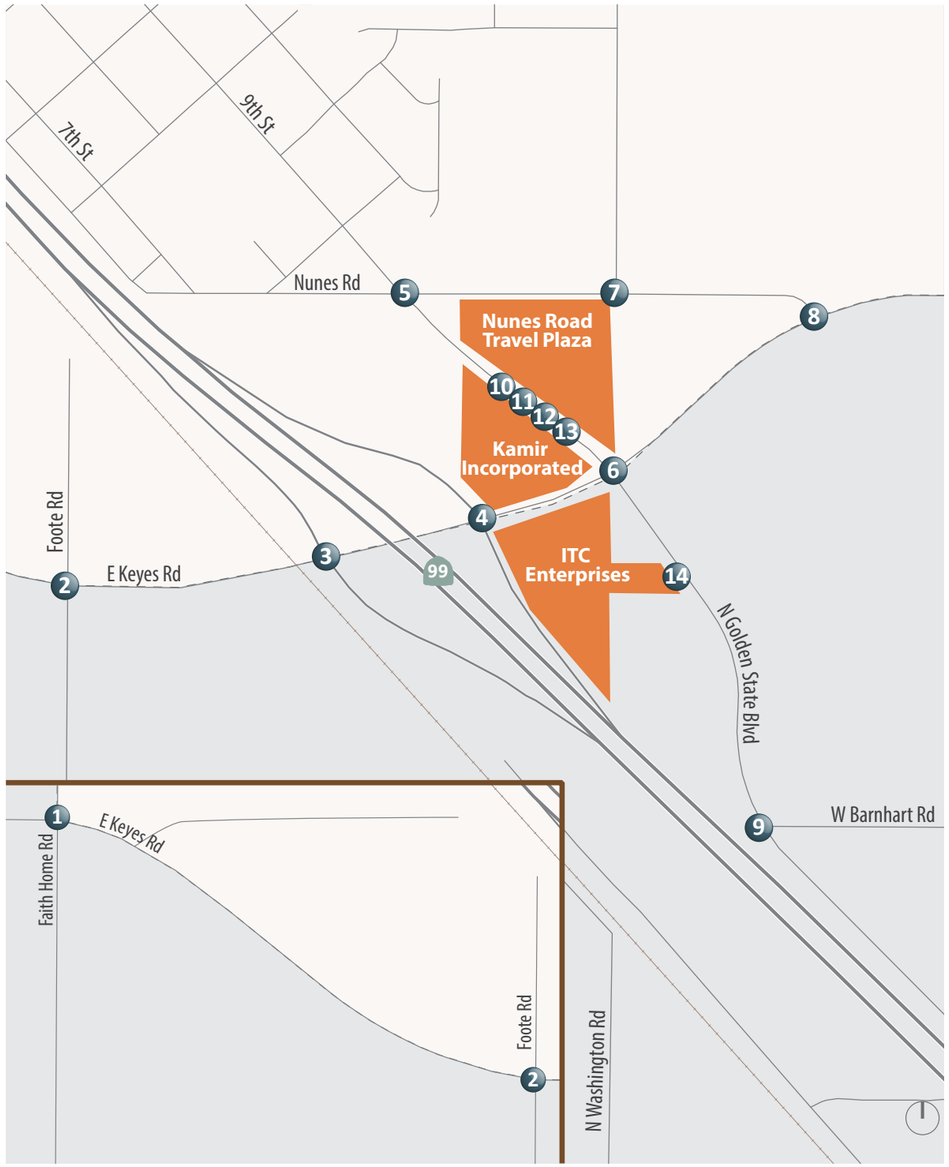
Stop Sign

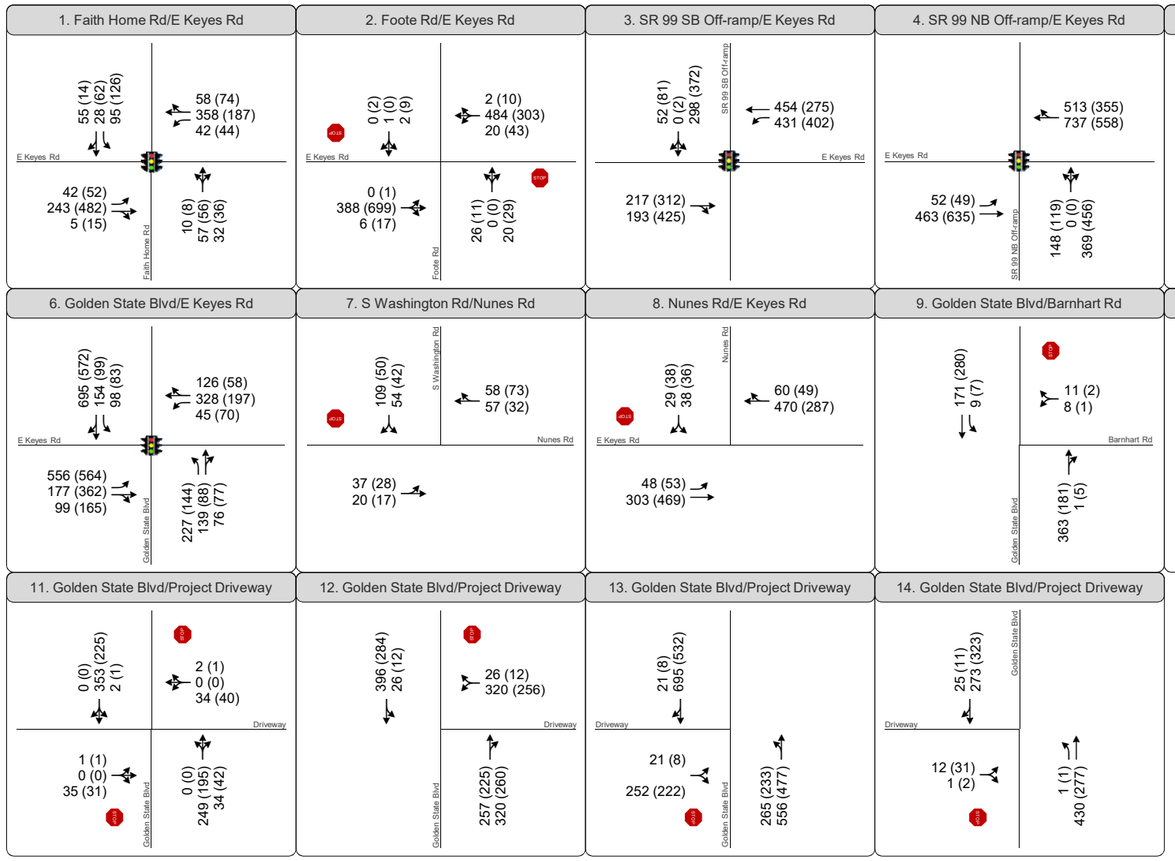
Project Sites

Study Intersection

Figure 9C

Existing with Kamir Incorporated Peak Hour Traffic Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Sites

Study Intersection

Figure 9D

Existing with Project Trips Combined Peak Hour Traffic Volumes

Table 6: Existing with Project Conditions - Intersection Levels of Service

	Intersection	Control[1]	Peak Hour	Existing Conditions		Existing with ITC Enterprises		Existing with Nunes Road Travel Plaza		Existing with Kamir Incorporated		Existing with Project Trips Combined	
				Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
1	Faith Home Road at Keyes Road	Signalized	AM PM	12 13	B B	12 13	B B	12 13	B B	12 13	B B	13 13	B B
2	Foote Road at Keyes Road	SSSC	AM PM	1 **(27)** 1 **(26)**	A **(D)** A **(D)**	1 **(27)** 1 **(27)**	A **(D)** A **(D)**	1 **(28)** 1 **(27)**	A **(D)** A **(D)**	1 **(28)** 1 **(27)**	A **(D)** A **(D)**	1 **(29)** 1 **(28)**	A **(D)** A **(D)**
3	State Route 99 Southbound Ramps at Keyes Road	Signalized[3]	AM PM	20 30	C C	21 31	C C	27 **62**	C **E**	25 **62**	C **E**	46 **104**	D **E**
4	State Route 99 Northbound Ramps at Keyes Road	Signalized[3]	AM PM	31 15	C B	34 15	C B	**72** **36**	**E** **D**	**58** 26	**E** C	**138** **62**	**F** **E**
5	9th Street/Golden State Boulevard at Nunes Road	AWSC	AM PM	11 8	B A	11 8	B A	11 8	B A	11 8	B A	11 9	B A
6	Golden State Boulevard at Keyes Road	Signalized	AM PM	25 20	C C	24 21	C C	**107** 32	**F** C	**88** 29	**F** C	**232** **88**	**F** **F**
7	South Washington at Nunes Road	SSSC	AM PM	6 (11) 5 (10)	A (B) A (A)	6 (11) 5 (10)	A (B) A (A)	6 (11) 5 (10)	A (B) A (A)	6 (11) 5 (10)	A (B) A (A)	6 (11) 5 (10)	A (B) A (A)
8	Nunes Road at Keyes Road	SSSC	AM PM	2 (12) 2 (12)	A (B) A (B)	2 (12) 2 (12)	A (B) A (B)	2 (13) 2 (12)	A (B) A (B)	2 (13) 2 (12)	A (B) A (B)	2 (13) 2 (12)	A (B) A (B)
9	Golden State Boulevard at Barnhart Road	SSSC	AM PM	1 (12) 1 (11)	A (B) A (B)	1 (12) 1 (11)	A (B) A (B)	1 (13) 1 (10)	A (B) A (B)	1 (12) 1 (10)	A (B) A (B)	1 (13) 1 (10)	A (B) A (B)
10	KI (North) Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	-- --	-- --	-- --	-- --	1 (14) 1 (12)	A (B) A (B)	1 (14) 1 (12)	A (B) A (B)
11	KI (Middle)/NRTP (North) Driveways at Golden State Boulevard	SSSC	AM PM	-- --	-- --	-- --	-- --	1 (14) 1 (12)	A (B) A (B)	1 (11) 1 (10)	A (B) A (A)	1 (17) 2 (14)	A (C) A (B)
12	NRTP (South) Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	-- --	-- --	**37 (>99)** 8 **(29)**	**E (F)** A **(D)**	-- --	-- --	**48 (>99)** 9 **(36)**	**E (F)** A **(E)**

Table 6: Existing with Project Conditions - Intersection Levels of Service													
	Intersection	**Control[1]**	**Peak Hour**	**Existing Conditions**		**Existing with ITC Enterprises**		**Existing with Nunes Road Travel Plaza**		**Existing with Kamir Incorporated**		**Existing with Project Trips Combined**	
				Delay[2]	**LOS**	**Delay[2]**	**LOS**	**Delay[2]**	**LOS**	**Delay[2]**	**LOS**	**Delay[2]**	**LOS**
13	KI (South) Driveway at Golden State Boulevard	SSSC	AM	--	--	--	--	--	--	7 (22)	A (C)	**36 (>99)**	**E (F)**
			PM	--	--	--	--	--	--	6 (13)	A (B)	5 (25)	A (C)
14	ITE Driveway at Golden State Boulevard	SSSC	AM	--	--	1 (15)	A (B)	--	--	--	--	1 (15)	A (B)
			PM	--	--	1 (14)	A (B)	--	--	--	--	1 (14)	A (B)

Notes:

1. AWSC = All-way Stop Control; SSSC = Side-street Stop Control
2. Average control delay expressed in seconds per vehicle. For side-street stop-controlled intersections, delay for the worst movement is expressed in parenthesis, with average intersection delay and LOS presented outside the parenthesis.
3. Intersection 3, State Route 99 Southbound Ramps at Keyes Road would operate at LOS D (37 seconds of delay per vehicle on average) under Existing Conditions even if signalized during the PM peak hour.

Bold indicates unacceptable intersection operations. **Bold and highlighted** indicates significant impacts.

Source: Fehr & Peers, 2019.

Existing with Project Freeway Operations

Freeway operations were evaluated using the HCM 6th Edition methodology with Existing with Project results summarized in Error! Reference source not found.. Projects that increase the traffic volume on the mainline segments that already exceed the acceptable threshold by 5 percent or more will cause a significant impact. Detailed calculation sheets are presented in **Appendix D.**

Table 7: Existing with Project Conditions – Freeway Segment Levels of Service

	Segment	Type	Peak Hour	Existing Conditions		Existing with Project Trips Combined		
				Density[1] (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Percentage of Mainline Traffic from Project
Northbound SR 99								
1	Keyes Rd Off-ramp	Diverge	AM	**35.3**	**E**	**35.8**	**E**	0.9%
			PM	31.7	D	32.1	D	-
2	Between Keyes Rd Off-ramp and On-ramp[2]	Basic	AM	30.5	D	29.1	D	-
			PM	24.5	C	23.3	C	-
3	Keyes Rd On-ramp	Merge	AM	31.5	D	32.6	D	-
			PM	25.6	C	26.6	C	-
Southbound SR 99								
1	Keyes Rd Off-ramp	Diverge	AM	30.6	D	31.3	D	-
			PM	**38.9**	**E**	**39.3**	**E**	0.6%
2	Between Keyes Rd Off-ramp and On-ramp[2]	Basic	AM	25.3	C	24.0	C	-
			PM	**38.8**	**E**	**36.1**	**E**	-3.8%
3	Keyes Rd On-ramp	Merge	AM	28.4	D	29.2	D	-
			PM	**37.2**	**F**	**37.7**	**F**	0.5%

Notes:
1. Density is presented in passenger cars per mile per lane (pc/mi/ln).
2. Nunes Road Travel Plaza and Kamir Incorporated would divert trips from this freeway segment; density improves with the addition of project traffic.

Bold indicates unacceptable freeway segment operations. **Bold and highlighted** indicates significant impacts.
Source: Fehr & Peers, 2019.

Northbound SR 99 at Keyes Road Off-ramp during the AM peak hour and Southbound SR 99 segments during the PM peak hour will remain at LOS at LOS E or F with the addition of project traffic. All other segments will continue to operate at acceptable service levels.

Existing with Project Transportation Impacts

The following transportation impacts would occur with the project(s) under Existing Conditions based on significance criteria from the Stanislaus County General Plan. Recommendations to improve site access are discussed in the Site Plan and Circulation section.

ITC Enterprises

The addition of ITC Enterprises project traffic under Existing with Project Conditions would not cause any impacts based on the significance criteria.

Nunes Road Travel Plaza

Impact TRANS-B1: SR 99 Southbound Ramps at Keyes Road (Intersection 3)

The addition of Nunes Road Travel Plaza project traffic under Existing with Project Conditions would add traffic to existing roadways that already exceeds the acceptable threshold (LOS C or better). SR 99 Southbound Ramps at Keyes Road would operate at LOS D during the PM peak hour under Existing without Project conditions even if signalized. This is considered a *significant impact*.

Mitigation Measure TRANS-1: Modifications to the SR 99/Keyes Road Interchange to include an eastbound right-turn pocket and a southbound right-turn pocket at the intersection of SR 99 Southbound Ramps at Keyes Road, and to include a westbound right-turn lane and a northbound right-turn pocket at the intersection of SR 99 Northbound Ramps at Keyes Road would mitigate the impact.

Constructing the improvement would result in a delay value of 32 seconds (LOS C) at the intersection of SR 99 Southbound Ramps at Keyes Road (under Existing with Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

Impact TRANS-B2: SR 99 Northbound Ramps at Keyes Road (Intersection 4)

The addition of Nunes Road Travel Plaza project traffic under Existing with Project Conditions would cause the LOS to degrade to LOS E during the AM peak hour. This is considered a *significant impact*.

Mitigation Measure TRANS-2: Implement Mitigation Measure TRANS-1.

Constructing the improvement would result in a delay value of 12 seconds (LOS B) at the intersection of SR 99 Northbound Ramps at Keyes Road (under Existing with Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

Impact TRANS-B3: Golden State Boulevard at Keyes Road (Intersection 6)

The addition of Nunes Road Travel Plaza project traffic under Existing with Project Conditions would cause the LOS to degrade to LOS F during the AM peak hour. This is considered a *significant impact*.

Mitigation Measure TRANS-3: Modifications to the intersection of Golden State Boulevard at Keyes Road to include a second eastbound left-turn pocket and receiving lane, and a channelized free southbound right-turn pocket and receiving lane. Keyes Road between SR 99 Northbound Ramps and Golden State Boulevard must be widened to two lanes in the westbound direction. Construction of these modifications would mitigate the impact.

Constructing the improvement would result in a delay value of 32 seconds (LOS C) at the intersection of Golden State Boulevard at Keyes Road (under Existing with Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

Kamir Incorporated

Impact TRANS-C1: SR 99 Southbound Ramps at Keyes Road (Intersection 3)

The addition of Kamir Incorporated project traffic under Existing with Project Conditions would add traffic to existing roadways that already exceeds the acceptable threshold (LOS C or better). SR 99 Southbound Ramps at Keyes Road would operate at LOS D during the PM peak hour under Existing without Project conditions even if signalized. This is considered a *significant impact*.

Mitigation Measure TRANS-4: Implement Mitigation Measure TRANS-1.

Constructing the improvement would result in a delay value of 32 seconds (LOS C) at the intersection of SR 99 Southbound Ramps at Keyes Road (under Existing with

Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

Impact TRANS-C2: SR 99 Northbound Ramps at Keyes Road (Intersection 4)

The addition of Kamir Incorporated project traffic under Existing with Project Conditions would cause the LOS to degrade to LOS E during the AM peak hour. This is considered a *significant impact*.

Mitigation Measure TRANS-5: Implement Mitigation Measure TRANS-1.

Constructing the improvement would result in a delay value of 12 seconds (LOS B) at the intersection of SR 99 Northbound Ramps at Keyes Road (under Existing with Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

Impact TRANS-C3: Golden State Boulevard at Keyes Road (Intersection 6)

The addition of Kamir Incorporated project traffic under Existing with Project Conditions would cause the LOS to degrade to LOS F during the AM peak hour. This is considered a *significant impact*.

Mitigation Measure TRANS-6: Implement Mitigation Measure TRANS-4.

Constructing the improvement would result in a delay value of 32 seconds (LOS C) at the intersection of Golden State Boulevard at Keyes Road (under Existing with Project Trips Combined), reducing the impact to a ***less-than significant*** level. The Project Applicant shall contribute a fair share towards the mitigation.

CUMULATIVE CONDITIONS

This chapter evaluates potential off-site traffic impacts under Cumulative without Project(s) and Cumulative with Project(s) Conditions. Cumulative without Project(s) Conditions are defined as existing volumes plus traffic generated by planned regional growth to occur by 2040 that would affect the transportation system in the study area.

No local roadway improvements are assumed under Cumulative Conditions. Mitigations that address impacts in the Cumulative scenarios will be used to develop a list of transportation projects for the Keyes Community Area Transportation Impact Fee Program. There are no freeway improvements listed in the *Regional Transportation Plan* (StanCOG, 2018) within the study area.

Cumulative Forecasts

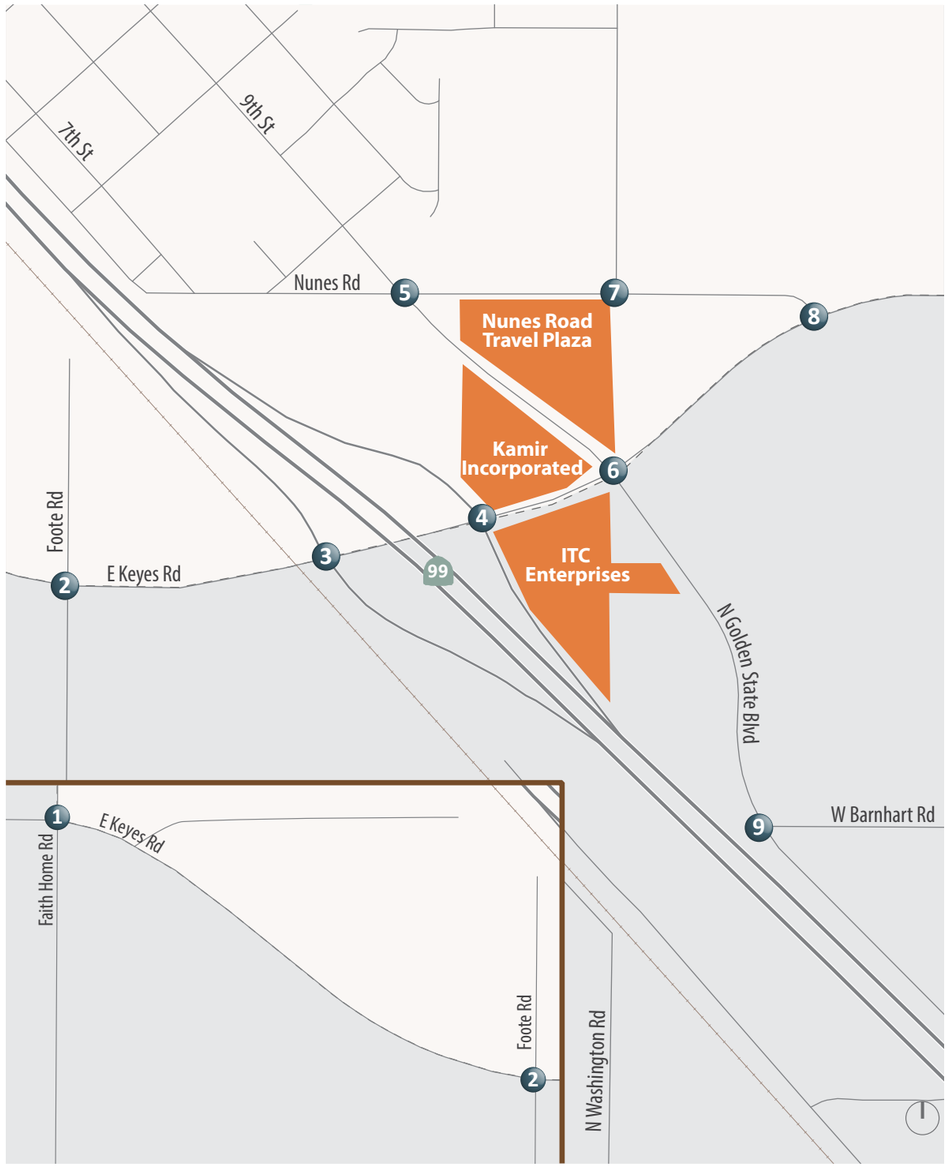
Cumulative forecasts are derived from year 2040 employment and housing projections from the Three-County (San Joaquin, Stanislaus, and Merced) regional travel demand model and the *Regional Transportation Plan*.

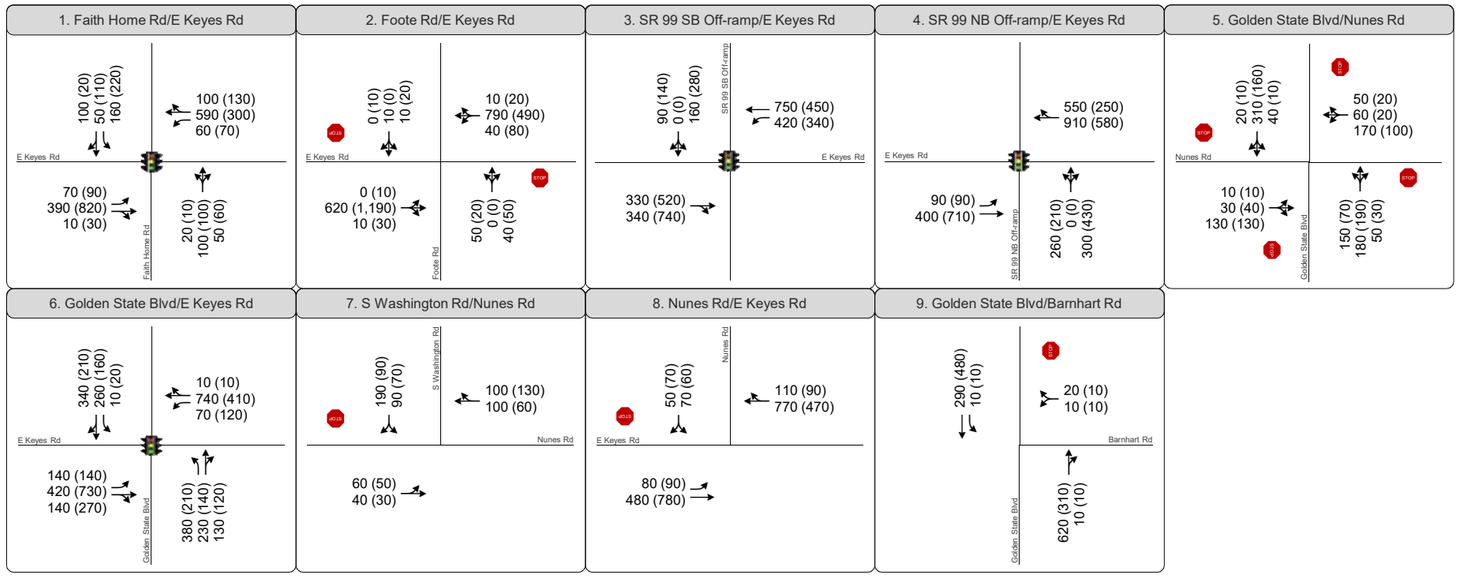
Household and employment projections within the census-designated place of Keyes were used to calculate an annual linear growth rate for intersection turning movement forecasts. The base year (2014) Three-County model assumes 1,536 households, 4,651 people, and 425 jobs within Keyes. The cumulative year (2040) model assumes 2,710 households, 8,144 people, and 754 jobs within Keyes. A technical memorandum detailing the study assumptions can be found in **Appendix E**.

An annual linear growth rate was calculated based on the net growth within Keyes - 1,174 households, 3,494 people, and 329 jobs; or approximately 3% growth per year locally. Cumulative without Project Conditions peak hour intersection turning movement volumes are shown on **Figure 10**. Cumulative with Project Conditions peak hour intersection turning movement volumes are shown on **Figure 11**.

Regional growth projections from the *Regional Transportation Plan* were used to calculate an annual linear growth rate for freeway forecasts. Appendix O from the Congestion Management Plan reflect a 2% growth per year locally.

The forecasting described above does not take into consideration some foreseeable travel changes, including increased use of transportation network companies, such as Uber and Lyft, nor the potential for autonomous vehicles. Although the technology for autonomous vehicles is expected to be available over the planning horizon, the Federal and State legal and policy frameworks are uncertain. Initial modeling of an autonomous future indicates that with automated and connected vehicles, the capacity of the existing transportation system would increase as vehicles can travel closer together; however, these efficiencies are only realized when a high percentage of vehicles on the roadway are automated and connected. There is also the potential for vehicle travel to increase with zero-occupant vehicles on the roadway, off-setting any potential capacity benefits. Although the future baseline is uncertain, the projects incremental effect on that future baseline is expected to be similar to the analysis results presented below.





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

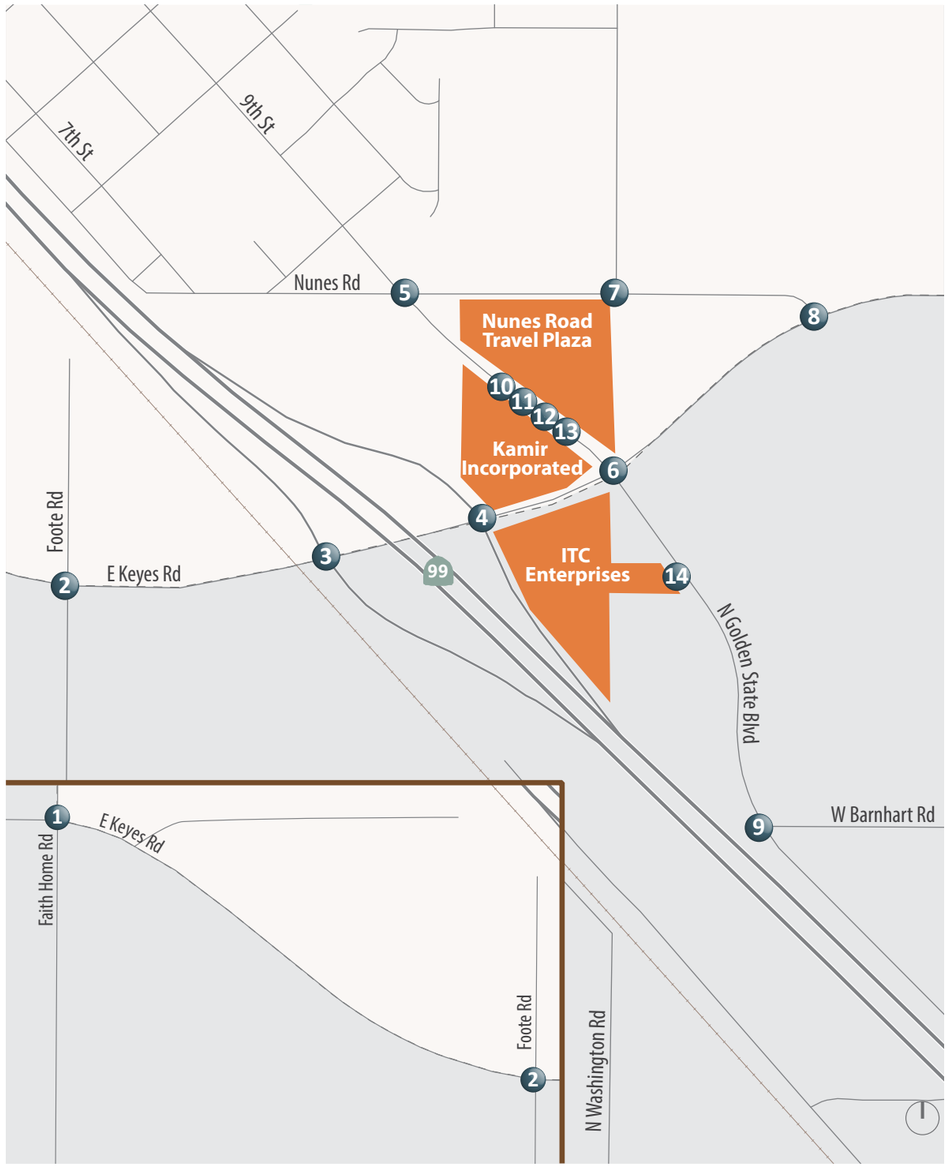
Stop Sign

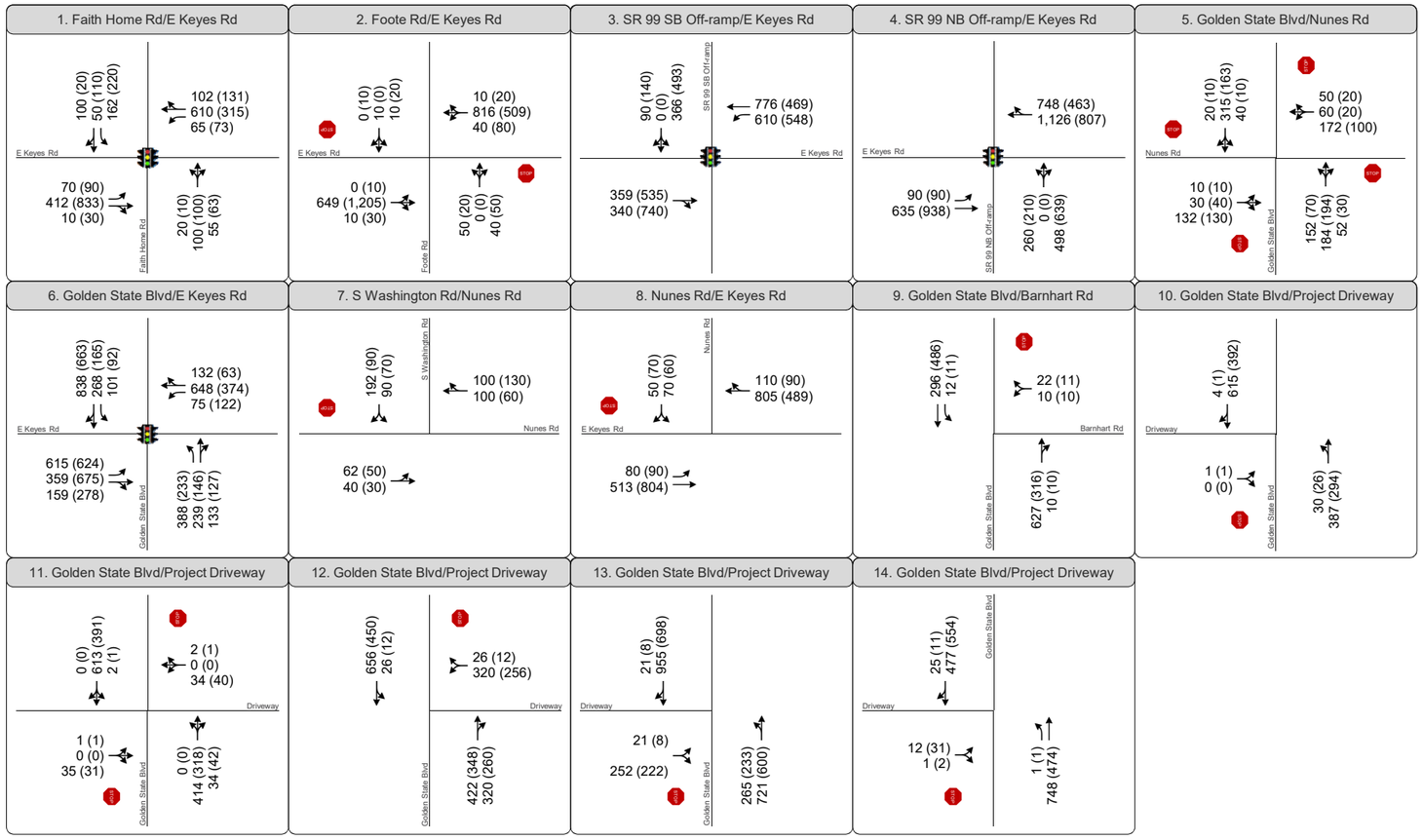
Project Sites

Study Intersection

Figure 10

Cumulative without Project Peak Hour Traffic Volumes





XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Sites

Study Intersection

Figure 11

Cumulative with Project Trips Combined Peak Hour Traffic Volumes

Cumulative Intersection Operations

Intersection operations were evaluated using the HCM 6th Edition methodology with Cumulative with Project results summarized in **Table 8**. Intersection LOS worksheets from Synchro 10 are provided in **Appendix B**. Peak hour signal warrants are provided in **Appendix C**.

Cumulative without Project(s)

Under Cumulative without Project(s) condition the following intersections are projected to operate below acceptable service levels in accordance with benchmarks set by Stanislaus County:

- Intersection 1: Faith Home Road at Keyes Road (LOS D and D, AM and PM peak hours);
- Intersection 2: Foote Road at Keyes Road (LOS F and F, AM and PM peak hours);
- Intersection 3: SR 99 Southbound Ramps at Keyes Road (LOS D and F, AM and PM peak hours);
- Intersection 4: SR 99 Northbound Ramps at Keyes Road (LOS F and E, AM and PM peak hours);
- Intersection 5: 9th St/Golden State Blvd at Nunes Road (LOS E, AM peak hour);
- Intersection 6: Golden State Boulevard at Keyes Road (LOS F and F, AM and PM peak hour); and
- Intersection 8: Nunes Road at Keyes Road (LOS E and D, AM and PM peak hours).

Cumulative with Project(s)

The addition of project traffic from ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated (Project Trips Combined) to existing roadway volumes would degrade the following intersection(s) to LOS D or worse or add traffic to existing intersections that already exceed the acceptable threshold:

- Intersection 1: Faith Home Road at Keyes Road (LOS D and D, AM and PM peak hours);
- Intersection 2: Foote Road at Keyes Road (LOS F and F with peak hour signal warrants not met, AM and PM peak hours);

- Intersection 3: SR 99 Southbound Ramps at Keyes Road (LOS F and F, AM and PM peak hours);
- Intersection 4: SR 99 Northbound Ramps at Keyes Road (LOS F and F, AM and PM peak hours);
- Intersection 5: 9th St/Golden State Blvd at Nunes Road (LOS E with peak hour signal warrant met, AM peak hour);
- Intersection 6: Golden State Boulevard at Keyes Road (LOS F and F, AM and PM peak hour);
- Intersection 8: Nunes Road at Keyes Road (LOS F and E with peak hour signal warrants met, AM and PM peak hours);
- Intersection 11: KI (Middle)/NRTP (North) Project Driveway at Golden State Boulevard (LOS D with peak hour signal warrant not met, AM peak hour);
- Intersection 12: NRTP (South) Project Driveway at Golden State Boulevard (LOS F and F with peak hour signal warrants met, AM and PM peak hours); and
- Intersection 13: KI (South) Project Driveway at Golden State Boulevard (LOS F and F with peak hour signal warrants met, AM and PM peak hours).

All other study intersections would continue to operate at LOS C or better with the addition of project traffic in all Cumulative with Project scenarios.

Table 8: Cumulative with Project Conditions - Intersection Levels of Service

	Intersection	Control[1]	Peak Hour	Cumulative without Project Conditions		Cumulative with Project Trips Combined	
				Delay[2]	LOS	Delay[2]	LOS
1	Faith Home Road at Keyes Road	Signalized	AM PM	**39** **37**	**D** **D**	**43** **46**	**D** **D**
2	Foote Road at Keyes Road	SSSC	AM PM	14 **(>99)** 9 **(>99)**	A **(F)** A **(F)**	18 **(>99)** 10 **(>99)**	C **(F)** B **(F)**
3	State Route 99 Southbound Ramps at Keyes Road	Signalized	AM PM	**53** **193**	**D** **F**	**150** **316**	**F** **F**
4	State Route 99 Northbound Ramps at Keyes Road	Signalized	AM PM	**217** **69**	**F** **E**	**384** **198**	**F** **F**
5	9th Street/Golden State Boulevard at Nunes Road	AWSC	AM PM	**37** 11	**E** B	**40** 11	**E** B
6	Golden State Boulevard at Keyes Road	Signalized	AM PM	**170** **118**	**F** **F**	**478** **299**	**F** **F**
7	South Washington at Nunes Road	SSSC	AM PM	7 (14) 5 (11)	A (B) A (B)	8 (14) 5 (11)	A (B) A (B)
8	Nunes Road at Keyes Road	SSSC	AM PM	4 **(42)** 4 **(34)**	A **(E)** A **(D)**	5 **(52)** 4 **(38)**	A **(F)** A **(E)**
9	Golden State Boulevard at Barnhart Road	SSSC	AM PM	1 (18) 1 (15)	A (C) A (B)	1 (18) 1 (15)	A (C) A (B)
10	KI (North) Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	1 (23) 1 (16)	A (C) A (C)
11	KI (Middle)/NRTP (North) Driveways at Golden State Boulevard	SSSC	AM PM	-- --	-- --	2 **(34)** 1 (20)	A **(D)** A (C)
12	NRTP (South) Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	**>99 (>99)** **28 (>99)**	**B (F)** **E (F)**
13	KI (South) Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	**>99 (>99)** 8 **(54)**	**F (F)** A **(F)**
14	ITE Driveway at Golden State Boulevard	SSSC	AM PM	-- --	-- --	1 (17) 1 (16)	A (C) A (C)

Notes:
1. AWSC = All-way Stop Control; SSSC = Side-street Stop Control
2. Average control delay expressed in seconds per vehicle. For side-street stop-controlled intersections, delay for the worst movement is expressed in parenthesis, with average intersection delay and LOS presented outside the parenthesis.

Bold indicates unacceptable intersection operations. **Bold and highlighted** indicates significant impacts.
Source: Fehr & Peers, 2019.

Cumulative Freeway Operations

Freeway operations were evaluated using the HCM 6th Edition methodology with Cumulative without Project(s) and Cumulative with Project Trips Combined results summarized in **Table 9**. Projects that increase the traffic volume on the mainline segments that already exceed the acceptable threshold by 5 percent or more will cause a significant impact. Detailed calculation sheets are presented in **Appendix D.**

Cumulative without Project(s)

Under Cumulative without Project(s) conditions all freeway segments operate below acceptable service levels in accordance with benchmarks set by Caltrans.

Cumulative with Project(s)

The addition of project traffic from ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated (Project Trips Combined) would add traffic to the following freeway segments that already exceed the acceptable threshold:

- Northbound SR 99 at Keyes Rd Off-Ramp;
- Northbound SR 99 at Keyes Rd On-Ramp;
- Southbound SR 99 at Keyes Rd Off-Ramp; and
- Southbound SR 99 at Keyes Rd On-Ramp.

The combined project traffic does not exceed 5 percent of the Cumulative mainline traffic on any of the study segments.

Table 9: Cumulative with Project Conditions – Freeway Segment Levels of Service

	Segment	Type	Peak Hour	Cumulative without Project		Cumulative with Project Trips Combined		
				Density[1] (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Percentage of Mainline Traffic from Project
Northbound SR 99								
1	Keyes Rd Off-ramp	Diverge	AM	**54.4**	**F**	**54.9**	**F**	0.6%
			PM	**44.2**	**F**	**44.5**	**F**	0.5%
2	Between Keyes Rd Off-ramp and On-ramp[2]	Basic	AM	**DEC[3]**	**F**	**DEC[3]**	**F**	-2.4%
			PM	**41.1**	**E**	**38.8**	**E**	-2.9%
3	Keyes Rd On-ramp	Merge	AM	**48.9**	**F**	**49.3**	**F**	0.6%
			PM	**36.5**	**F**	**36.9**	**F**	0.4%
Southbound SR 99								
1	Keyes Rd Off-ramp	Diverge	AM	**43.0**	**F**	**43.6**	**F**	1.0%
			PM	**63.5**	**F**	**63.9**	**F**	0.4%
2	Between Keyes Rd Off-ramp and On-ramp[2]	Basic	AM	**44.7**	**F**	**41.9**	**F**	-2.9%
			PM	**DEC[3]**	**F**	**DEC[3]**	**F**	-2.7%
3	Keyes Rd On-ramp	Merge	AM	**42.5**	**F**	**42.6**	**F**	0.6%
			PM	**61.2**	**F**	**60.9**	**F**	0.3%

Notes:
1. Density is presented in passenger cars per mile per lane (pc/mi/ln).
2. Nunes Road Travel Plaza and Kamir Incorporated would divert trips from this freeway segment; density improves with the addition of project traffic.
3. DEC = Demand exceeds capacity.

Bold indicates unacceptable freeway segment operations. **Bold and highlighted** indicates significant impacts.
Source: Fehr & Peers, 2019.

Cumulative Transportation Impacts

The following transportation impacts are projected to occur with the project(s) under Cumulative Conditions based on significance criteria from the Stanislaus County General Plan. Cumulative intersection operations with mitigations are summarized in **Table 10**. Intersection Recommendations to improve site access are discussed in the Site Plan and Circulation section.

Impact TRANS-A1/B4/C4: Faith Home Road at Keyes Road (Intersection 1)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). Faith Home Road at Keyes Road operates at LOS D and D during the AM and PM peak hours under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-7: Widen Keyes Road from two to four lanes between Faith Home Road and Golden State Boulevard.

Mitigation Measure TRANS-8: Modify the intersection of Faith Home Road at Keyes Road to include a northbound right-turn pocket.

Constructing the improvements would result in a delay value of 34 and 31 seconds (LOS C and C during the AM and PM peak hours) at the intersection of Faith Home Road at Keyes Road, reducing the impact to a ***less-than significant*** level. The Project Applicants shall contribute a fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program.

Impact TRANS-A2/B5/C5: SR 99 Southbound Ramps at Keyes Road (Intersection 3)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). SR 99 Southbound Ramps at Keyes Road operates at LOS D and F during the AM and PM peak hours under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-9: Implement Mitigation Measure TRANS-7. Modifications to the SR 99/Keyes Road Interchange to include a second westbound

left-turn pocket and the southbound approach to include one right-turn pocket, one left-turn pocket, and one shared left/through lane at the intersection of SR 99 Southbound Ramps at Keyes Road, and to include a westbound right-turn lane and the northbound approach to include one right-turn pocket and one shared left/through lane at the intersection of SR 99 Northbound Ramps at Keyes Road would mitigate the impact.

Constructing the improvement would result in a delay value of 27 and 34 seconds (LOS C and C during the AM and PM peak hours) at the intersection of SR 99 Southbound Ramps at Keyes Road), reducing the impact to a ***less-than significant*** level. The Project Applicants shall contribute fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program.

Impact TRANS-A3/B6/C6: SR 99 Northbound Ramps at Keyes Road (Intersection 4)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). SR 99 Northbound Ramps at Keyes Road operates at LOS F and E during the AM and PM peak hours under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-10: Implement Mitigation Measure TRANS-9.

Constructing the improvement would result in a delay value of 31 and 27 seconds (LOS C and C during the AM and PM peak hours) at the intersection of SR 99 Northbound Ramps at Keyes Road), reducing the impact to a ***less-than significant*** level. The Project Applicants shall contribute fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program.

Impact TRANS-A4/B7/C7: 9th St/Golden State Blvd at Nunes Road (Intersection 5)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). 9th St/Golden State Blvd at Nunes Road operates at LOS E during the AM peak hour under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-11: Widen Golden State Boulevard from two to four lanes between Nunes Road and the ITC Enterprises Project Driveway and construct a one-lane roundabout at the intersection of 9th Street/Golden State Boulevard at Nunes Road. This improvement shall include Class II bicycle lanes along Golden State Boulevard south of Nunes Road and along Nunes Road west of Golden State Boulevard.

Constructing the improvement would result in a delay value of 18 seconds (LOS C) at the intersection of 9th Street at Golden State Boulevard at Nunes Road, reducing the impact to a ***less-than significant*** level. The Project Applicants shall contribute a fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program.

Impact TRANS-A5/B8/C8: Golden State Boulevard at Keyes Road (Intersection 6)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). Golden State Boulevard at Keyes Road operates at LOS F and F during the AM and PM peak hours under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-12: Implement Mitigation Measure TRANS-7 and Mitigation Measure TRANS-11. Modify the intersection of Golden State Boulevard at Keyes Road to have two left-turn pockets and one right-turn pocket on all approaches; the southbound approach should have a channelized free southbound right-turn pocket and receiving lane. Keyes Road between SR 99 Northbound Ramps and Golden State Boulevard should be widened to three lanes in the westbound direction to accommodate the free southbound right-turn. This improvement shall include Class II bicycle lanes along Golden State Boulevard.

Constructing the improvement would result in a delay value of 42 and 34 seconds (LOS D and C during the AM and PM peak hours) at the intersection of Golden State Blvd at Keyes Road excluding the unsignalized delay for the free southbound right-turn movement. If the unsignalized delay for the free southbound right-turn movement is included, constructing the improvements would result in a delay value of 33 and 27 seconds (LOS C and C during the AM and PM peak hours). Construction of the improvements reduces the impact to a ***less-than significant***

level. The Project Applicants shall contribute a fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program.

Impact TRANS-A6/B9/C9: Nunes Road at Keyes Road (Intersection 8)

The addition of ITC Enterprises, Nunes Road Travel Plaza, and Kamir Incorporated project traffic under Cumulative with Project Conditions would add traffic to roadways that already exceed the acceptable threshold (LOS C or better). Nunes Road at Keyes Road operates at LOS E and D during the AM and PM peak hours under Cumulative without Project conditions. This is considered a *significant impact*.

Mitigation Measure TRANS-13: Construct a receiving lane/acceleration lane for the southbound left-turn movement at the intersection of Nunes Road at Keyes Road.

Constructing the improvement would result in a delay value of 17 and 15 seconds (LOS B and C during the AM and PM peak hours) at the intersection of Nunes Road at Keyes Road, reducing the impact to a ***less-than significant*** level. The Project Applicants shall contribute a fair share towards the mitigation by paying into the Keyes Community Plan Area Transportation Impact Fee Program

Table 10: Cumulative with Project Conditions - Intersection Levels of Service with Mitigations									
	Intersection	Control[1]	Peak Hour	Cumulative without Project Conditions		Cumulative with Project Trips Combined		Cumulative with Project Trips Combined with Mitigation	
				Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
1	Faith Home Road at Keyes Road	Signalized	AM PM	**39** **37**	**D** **D**	**43** **46**	**D** **D**	34 31	C C
3	State Route 99 Southbound Ramps at Keyes Road	Signalized	AM PM	**53** **193**	**D** **F**	**150** **316**	**F** **F**	27 34	C C
4	State Route 99 Northbound Ramps at Keyes Road	Signalized	AM PM	**217** **69**	**F** **E**	**384** **198**	**F** **F**	31 27	C C
5	9th Street/Golden State Boulevard at Nunes Road	AWSC/ Round-about[3]	AM PM	**37** 11	**E** B	**40** 11	**E** B	7 11	A B
6	Golden State Boulevard at Keyes Road	Signalized	AM PM	**170** **118**	**F** **F**	**478** **299**	**F** **F**	33 27	C C
8	Nunes Road at Keyes Road	SSSC	AM PM	4 **(42)** 4 **(34)**	A **(E)** A **(D)**	5 **(52)** 4 **(38)**	A **(F)** A **(E)**	2 (17) 2 (15)	A (C) A (B)

Notes:
1. AWSC = All-way Stop Control; SSSC = Side-street Stop Control
2. Average control delay expressed in seconds per vehicle. For side-street stop-controlled intersections, delay for the worst movement is expressed in parenthesis, with average intersection delay and LOS presented outside the parenthesis.
3. Intersection 5 is currently all-way stop controlled. Construction of the mitigation would alter the intersection to become a roundabout.

Bold indicates unacceptable intersection operations. **Bold and highlighted** indicates significant impacts.
Source: Fehr & Peers, 2019.

VEHICLE MILES OF TRAVEL

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. The final proposed Guidelines include a new Section 15064.3 on Vehicle Miles of Travel (VMT) analysis and thresholds for land use developments. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. New Guidelines section 15064.3 states that they do not take effect until July 1, 2020 unless the lead agency adopts them earlier.

Stanislaus County has not established any standards or thresholds related to VMT, therefore the new guidelines have not yet been adopted and are not in effect at this time. Since there are no standards in effect on VMT analysis, a preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed projects was prepared for information and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

To assess the project's effect on VMT, the Three-County Regional Travel Demand Model was used to estimate Total VMT within the Keyes Community Plan Area, Stanislaus County, and surrounding Cities for the existing and cumulative scenarios. Total VMT and Total VMT per Service Population both without and with the proposed projects are summarized in **Table 11**. All the following metrics are measured for 'weekday' conditions and that label may be appended to any of the metrics.

The addition of project land uses is expected to increase Total VMT generated by the Keyes Community Plan Area by approximately 17,800 miles under existing conditions and 16,500 miles under cumulative conditions.

Additionally, Total VMT would increase overall in Stanislaus County, but decrease in the adjacent cities of Modesto and Ceres. Results of the VMT analysis indicate the project would contribute to an increase in vehicle miles of travel.

Table 11: VMT Summary						
Area	Total VMT		Service Population[1]		Total VMT per Service Population	
	No Project	With Project	No Project	With Project	No Project	With Project
Existing Year Conditions						
Keyes	153,700	171,500	5,290	5,440	29.05	31.53
Ceres	1,463,000	1,462,200	60,290	60,290	24.27	24.25
Modesto	8,011,900	8,009,300	337,610	337,610	23.73	23.72
Stanislaus County	20,070,200	20,080,300	718,790	718,940	27.92	27.93
Cumulative Year Conditions						
Keyes	226,700	243,200	9,150	9,300	24.78	26.15
Ceres	2,054,200	2,053,200	72,720	72,720	28.25	28.23
Modesto	12,299,000	12,297,700	475,160	475,160	25.88	25.88
Stanislaus County	35,151,600	35,162,800	1,216,090	1,216,240	28.91	28.91

Notes:
1. Service population is the population plus employment of the area of study.
Source: Fehr & Peers, 2019.

SITE ACCESS AND CIRCULATION

Site access and internal circulation for vehicles, pedestrians, bicycles, and emergency vehicles was analyzed based on the site plans presented on Figures 2A-C. A parking assessment was also conducted.

Vehicular Access and Circulation

Vehicular access and circulation were evaluated at each of the three project sites. Site plan revisions are required to accommodate the traffic projected at Nunes Road Travel Plaza and Kamir Incorporated.

ITC Enterprises

Vehicular access to the project site would be provided by an unsignalized driveway on Golden State Boulevard. The project would also construct an internal driveway connecting to the adjacent Peterbilt Development. The main driveway entry from Golden State Boulevard features roughly 350 feet or storage for vehicles exiting the site.

Circulation within the site is provided by drive aisles surrounding the office and warehouse/shop. The site plan does not show any detail of traffic control devices, such as stripping and signage, on site.

> ***Site Recommendation A1:*** As a part of the final site plan indicate locations where traffic control devices would be installed. Consider stripping stop bars on the northbound and southbound approach at the intersection west of the main driveway entry off Golden State Boulevard, and on the westbound approach at the intersection west of the internal driveway connecting to the adjacent Peterbilt Development.

As shown in the previous sections, the site access intersection would operate at overall acceptable service levels with minimal delay for vehicles entering or exiting the site under Existing with Projects and Cumulative with Projects conditions. Left-turns into the project site can made from the two-way-left-turn lane in the median. Left-turns out of the project site can be made into the two-way-left-turn lane; vehicles may subsequently merge onto Golden State Boulevard.

Nunes Road Travel Plaza

Vehicular access to the project would be provided by two unsignalized driveways on Golden State Boulevard – one for trucks (North Driveway) and one for passenger vehicles (South Driveway), and one unsignalized driveway on Nunes Road into the area for trucks. Conversations with County staff indicated that the driveway on Nunes Road would be closed or restricted to emergency vehicles only in order to restrict the amount of truck traffic on Nunes Road. The project would also construct three internal driveways that could connect to adjacent development in the future.

> ***Site Recommendation B1:*** Work with County staff to determine if the project driveway on Nunes Road will be closed or restricted to emergency vehicle traffic only. Install signage if necessary.

Circulation within the site is separated by modes. The north side of the property is reserved for trucks has an open layout with no drive aisles. The south side of the property is reserved for passenger vehicles and features two-way drive aisles around the entire site.

> ***Site Recommendation B2:*** As a part of the final site plan indicate locations where traffic control devices would be installed. Consider striping stop bars on the northbound approach at the intersection providing access to the drive-thru restaurant and other minor approaches at intersections throughout the site.

Site Access Improvements

Relative to the proposed Kamir Incorporated (KI) Development, the Nunes Road Travel Plaza (NRTP) North Driveway is located across from KI Middle Driveway. The NRTP South Driveway is located between the KI Middle Driveway and the KI South Driveway.

The NRTP North Driveway/KI Middle Driveway at Golden State Boulevard would operate acceptably in the Existing with Projects scenario during the AM and PM peak periods. However, in the Cumulative with Projects scenario, the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard delay increases to LOS D during the AM peak hour; the intersection would not meet peak hour signal warrants.

The NRTP South Driveway at Golden State Boulevard would operate at LOS F and E under Existing with Projects scenario during the AM and PM peak hours and LOS F and F under the Cumulative with Projects scenario during the AM and PM Peak hours. The intersection

of NRTP South Driveway at Golden State Boulevard would meet peak hours signal warrants due to the high volume of left-turning vehicles out of the project site. The traffic signal should be at a location that provides access to both NRTP and KI.

Site Recommendation B3: Reconfigure the site plan to include an internal drive aisle between the north side of the property and the south side of the property. Given the close proximity of the project driveways on Golden State Boulevard to Keyes Road, the southern driveway should be restricted to right-in/right-out access, resulting in all vehicles using the NRTP North Driveway to make left turns into and out of the site. To restrict left-turn access into and out of the NRTP South Driveway, construct a raised median on Golden State Boulevard. Install wayfinding signage as necessary.

Install a traffic signal at the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard; align both driveways. The westbound approach should have one left-turn pocket and one shared left/through/right lane. The left-turn pocket should be at least 200 feet in length to accommodate typical vehicle queues.

Site Recommendation B4: Golden State Boulevard along the project frontage should be constructed to accommodate four travel lanes with turn pockets (five vehicle lanes total), a raised median, and two bicycle lanes in each direction.

Kamir Incorporated

Vehicular access to the project would be provided by three unsignalized driveways on Golden State Boulevard – two for trucks (North and Middle Driveways) and one for all vehicles (South Driveway). The project would also construct one internal driveway that could connect to adjacent development in the future.

Circulation within the site is separated by modes. The north side of the property is reserved for trucks has an open layout with drive aisles between the truck fueling area and truck parking and between the truck fueling area and convenience store. The south side of the property features two-way drive aisles around the entire site except where the drive thru locations are. Additionally, there is a one-way drive aisle for trucks to access the north side of the property from the south side of the property.

Site Recommendation C1: As a part of the final site plan indicate locations where traffic control devices would be installed. Consider stripping stop bars on minor approaches at intersections throughout the site.

Relative to the proposed NRTP Development, the KI North Driveway is located north of the NRTP North Driveway. The KI Middle Driveway is located across from the NRTP North Driveway. The KI South Driveway is located south of the NRTP South Driveway along Golden State Boulevard.

The KI North Driveway at Golden State Boulevard would operate acceptably in the Existing with Projects and Cumulative with Projects scenario during the AM and PM peak periods.

The NRTP North Driveway/KI Middle Driveway at Golden State Boulevard would operate acceptably in the Existing with Projects scenario during the AM and PM peak periods. However, in the Cumulative with Projects scenario, the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard delay increases to LOS D during the AM peak hour; the intersection would not meet peak hour signal warrants.

The KI South Driveway at Golden State Boulevard would operate at LOS F and C under Existing with Projects scenario during the AM and PM peak hours and LOS F and F under the Cumulative with Projects scenario during the AM and PM Peak hours. The intersection of KI South Driveway at Golden State Boulevard would meet peak hours signal warrants.

Site Recommendation C2: Reconfigure the site plan to include a two-way internal drive aisle between the north side of the property and the south side of the property. Vehicles will use the KI Middle Driveway to make left turns into and out of the site. Restrict left-turn access into and out of the KI South Driveway by constructing a raised median on Golden State Boulevard. Install wayfinding signage as necessary.

Install a traffic signal at the intersection of NRTP North Driveway/KI Middle Driveway at Golden State Boulevard; align both driveways. The eastbound approach operates at acceptable levels with one shared left/through/right lane, however, should the site plan changes increase the volume of right-turns out of the KI Middle Drive, reconfigure the eastbound approach to include one shared left/through lane and one right-turn pocket.

Site Recommendation C3: Golden State Boulevard along the project frontage should be constructed to accommodate four travel lanes with turn pockets (five vehicle lanes total), a raised median, and two bicycle lanes in each direction.

Vehicular Parking

Vehicular parking supply and demand were reviewed against the Stanislaus County Municipal Code and the Parking Generation Manual, 5th Edition (*ITE, 2019*). Off-street parking requirements are outlined in Section 21.76 of the Stanislaus County Municipal Code and summarized in **Table 12**. Peak period parking demand estimates from the Parking Generation Manual, 5th Edition are summarized in **Table 13**.

Table 12: Off-Street Parking Requirements

Land Use	Size	Requirement	Required Supply	Proposed Supply
ITC Enterprises				
Truck Leasing/Rental	N/A	1 space per employee on a maximum shift and 1 space per every twenty vehicles for sale	N/A	23 car spaces
		Total Off-Street Parking:	N/A	23
		Deficit/Surplus:	N/A	
Nunes Road Travel Plaza				
Convenience Store	7,000 sq. ft.	1 space per 300 sf	23	89 car spaces 46 truck spaces
Restaurant	Not Specified	1 space per 4 seats	--	
Truck Wash/Repair[1]	14,100 sq. ft.	1 space per 300 sf	47[2]	
		Total Off-Street Parking:	70+	135
		Deficit/Surplus:	+69 or fewer	
Kamir Incorporated				
Convenience Store	4,800 sq. ft.	1 space per 300 sf	16	64 car spaces 37 truck spaces
Restaurant	120 seats total	1 space per 4 seats	30	
		Total Off-Street Parking:	46	101
		Deficit/Surplus:	+55	

Notes:
1. Service establishments and garages/repair shops are both required to provide one space for each three hundred square feet of gross area.
2. Spaces inside a garage may be counted towards meeting of the requirement.

Bold indicates that the proposed parking supply is less than the required parking supply.
Source: Stanislaus County Municipal Code; Fehr & Peers, 2019

Table 13: Estimated Peak Parking Demand			
Land Use	**Size**	**Weekday Demand (Weekend Demand)**	**Supply**
ITC Enterprises			
Truck Leasing/ Rental/Service[1]	35,000 sq. ft.	27 (N/A)	23
	Total Peak Period Demand:	**27 (N/A)**	
Nunes Road Travel Plaza			
Convenience Market/ Gas Station[2]	7,000 sq. ft.	57 (35)	135
Fast Food Restaurant with Drive Thru[3]	4.278 sq. ft.	53 (39)	
	Total Peak Period Demand:	110 (74)	
Kamir Incorporated			
Convenience Market/ Gas Station[2]	4,800 sq. ft.	39 (24)	101
Fast Food Restaurant with Drive Thru[3]	6,000 sq. ft.	74 (55)	
Fast Food Restaurant without Drive Thru[4]	2,000 sq. ft.	38 (n/a)	
	Total Peak Period Demand:	**151 (79+)**	

Notes:

1. Based on peak period parking demand rates for land use 842, Recreational Vehicle Sales. Parking demand peaks on weekday from 2:00 PM – 3:00 PM. Weekend data not available.
2. Based on peak period parking demand rates for land use 960, Super Convenience Market/Gas Station. Parking demand peaks on weekdays and weekends from 11:00 AM – 12:00 PM.
3. Based on peak period parking demand rates for land use 934, Fast Food Restaurant with Drive Thru. Parking demand peaks on weekdays and weekends from 12:00 – 1:00 PM.
4. Based on peak period parking demand rates for land use 933, Fast Food Restaurant without Drive Thru. Weekend data not available. Parking demand estimated to peak similarly to land use 934.

Bold indicates parking demand potentially exceeds supply for some portion of the day.
Source: *Parking Generation Manual, 5th Edition*. (Institute of Transportation Engineers, 2019); Fehr & Peers, 2019

ITC Enterprises

ITC Enterprises propose to provide a total of 23 parking spaces for passenger vehicles. Based on the Municipal Code, ITC Enterprises is required to provide at least one parking spaces for each employee on a maximum shift and one customer parking space per every twenty vehicles for sale. ADA requirements will be determined based on the number of parking spots required.

Site Recommendation A2: Ensure that accessible parking is located as close as possible to the main entrance of the proposed office.

Parking demand at the proposed truck lease/rental/service location was estimated using ITE land use 842, Recreational Vehicle Sales. Based on the analysis, the site may not provide enough parking to accommodate typical peak parking demand on a weekday.

Site Recommendation A3: Identify five additional parking spaces to accommodate the projected peak parking demand.

Nunes Road Travel Plaza

Nunes Road Travel Plaza propose to provide a total of 73 parking spaces for passenger vehicles - four van accessible spaces, two electric vehicle charging spaces, five employee spaces, and 62 spaces with no restrictions – and 41 parking spaces for trucks. There are an additional 16 spaces for passenger vehicle and 5 spaces for trucks at the gas pumps. In total NRTP would provide 89 spaces for passenger vehicle spaces and an estimated 46 spaces for trucks.

Based on the Municipal Code, NRTP is required to provide *at least* 70 parking spaces (the number of seats in the restaurant portion of the site was not specified and is not included in this value). Based on ADA requirements, 4 of the 114 off-street parking spaces proposed (does not include spaces at gas pumps) must be accessible, and 1 of the 4 accessible spaces must be van accessible; the project proposes 4 van accessible spaces which satisfies the requirement.

Site Recommendation B5: Provide information on the number of seats proposed in the fast-food restaurant. Should the number of seats proposed in the fast-food restaurant exceed 260 (65 x 4), additional parking must be provided at a rate of 1 space per 4 additional seats.

Parking demand at Nunes Road Travel Plaza is estimated to peak at approximately 12:00 PM. For the parking demand assessment, it was assumed that trips to or from the truck wash and repair area at the Nunes Road Travel Plaza would be internalized trips from the gas/service station and/or convenience market. The site generally provides enough parking to accommodate typical peak parking demand on a weekday and weekend.

Kamir Incorporated

Kamir Incorporated propose to provide a total of 52 parking spaces for passenger vehicles - six van accessible spaces and 46 spaces with no restrictions – and 30 parking spaces for trucks. There are an additional 12 spaces for passenger vehicle and 7 spaces for trucks at the gas pumps. In total KI would provide 64 spaces for passenger vehicle spaces and 37 spaces for trucks.

Based on the Municipal Code, KI is required to provide 46 parking spaces, resulting in a surplus of 55 spaces. Based on ADA requirements, 4 of the 82 spaces off-street parking spaces proposed (does not include spaces at gas pumps) must be accessible, and 1 of the 4 accessible spaces must be van accessible; the project proposes 6 van accessible spaces which satisfies the requirement.

Parking demand at Kamir Incorporated is estimated to peak at approximately 12:00 PM. The site would not provide enough parking to accommodate typical peak parking demand on a weekday. No internalized trips between the gas station/convenience market and the fast food restaurant(s) were assumed.

> ***Recommendation C4:*** As the restaurant portion of the site is leased, conduct parking surveys to determine if the proposed tenant mix is effectively sharing the available parking supply, and implement additional parking demand management strategies, if necessary.

Pedestrian Access and Circulation

Pedestrians access to the project sites would be provided by sidewalks proposed along the project frontages. In the immediate project vicinity, sidewalks are provided on Golden State Boulevard and 9th Street adjacent to developed parcels. Although there are no sidewalks on Golden State Boulevard at Keyes Road, the intersection features crosswalks on all four approaches and push-activated pedestrian signals.

> ***Site Recommendation A4:*** As a part of the final site plan show an accessible pedestrian path compliant with ADA regulations from Golden State Boulevard to the proposed office.

Site Recommendation B6: As a part of the final site plan show an accessible pedestrian path compliant with ADA regulations from Golden State Boulevard to the fast-food restaurant located adjacent to the southern property line.

Bicycle Access and Circulation

Bicycle facilities are proposed by Stanislaus County on Golden State Boulevard along the project frontages. Class II bicycle lanes are planned beginning south of Nunes Road. It is not clear how the proposed project accommodates the ultimately planned bicycle facilities in the project vicinity.

Recommendation A5/B7/C5: Consult with Stanislaus County to ensure that the proposed project design does not conflict with the ultimate provision of bicycle facilities along the project frontage.

None of the proposed projects provide short-term or long-term bicycle parking.

Recommendation A6/B8/C6: Identify areas where short-term bicycle parking would be accommodated on the final site plan.

Transit Access

Existing bus stops are located on 9th Street/Golden State Boulevard at Nunes Road (bus travels northbound) and at Maud Avenue (bus travels southbound); both stations are served by **Route 15** which travels between Modesto and Turlock. Modesto and Turlock both have airports and regional train stations (Amtrak). To access the bus stops pedestrians must travel along 9th Street/Golden State Boulevard.

Even with the construction of the proposed projects, sidewalk gaps to and from the bus stops will remain at the following locations:

- The west side of 9th Street between Grace Avenue and Nunes Road;
- The intersection of 9th Street/Golden State Boulevard at Nunes Road;
- The east side of Golden State Boulevard between Nunes Road and the Nunes Road Travel Plaza project frontage (approved development will construct sidewalks on the west side); and
- The intersection of Golden State Boulevard at Keyes Road.

Emergency Vehicle Access

Factors such as the number of access points, roadway width, and proximity to fire stations determine whether a project provides enough emergency access. Emergency vehicle access is provided by the project driveways and the internal roadways.

Emergency Vehicle Access to the project sites is provided by Golden State Boulevard. The fire station most likely to serve the site is Keyes Fire Department located on Maud Avenue at 7th Street, about 0.6 miles northwest of the project sites. Emergency vehicles would travel southbound on 7th Street, eastbound on Nunes Road, and then southbound on Golden State Boulevard to access the project site.

Appendix A:
Traffic Counts



Appendix B:
Intersection Operation Worksheets



Appendix C:
Peak Hour Signal Warrants



Appendix D:
Freeway Mainline & Ramp Junction Operation Worksheets



Appendix E:
Study Assumptions Memorandum



Appendix A:
Traffic Counts



ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-001
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	Faith Home Rd Southbound					Keyes Rd Westbound					Faith Home Rd Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	15	2	14	0	31	11	76	10	0	97	6	12	7	0	25	4	39	2	0	45	198	0
7:15	16	10	14	0	40	9	101	9	0	119	3	16	5	0	24	8	57	1	0	66	249	0
7:30	30	7	14	0	51	10	76	17	0	103	4	18	6	0	28	7	60	2	0	69	251	0
7:45	24	8	16	0	48	7	89	19	0	115	3	13	9	0	25	15	60	0	0	75	263	0
Total	85	27	58	0	170	37	342	55	0	434	16	59	27	0	102	34	216	5	0	255	961	0
8:00	23	3	11	0	37	11	72	11	0	94	0	10	7	0	17	12	44	2	0	58	206	0
8:15	16	5	18	0	39	6	58	7	0	71	1	10	11	0	22	7	51	3	0	61	193	0
8:30	14	9	6	0	29	11	61	9	0	81	2	7	8	0	17	7	51	2	0	60	187	0
8:45	17	9	6	0	32	7	52	16	0	75	4	4	16	0	24	6	55	4	0	65	196	0
Total	70	26	41	0	137	35	243	43	0	321	7	31	42	0	80	32	201	11	0	244	782	0
16:00	18	13	7	0	38	8	36	15	0	59	3	13	6	0	22	11	119	5	0	135	254	0
16:15	23	14	3	0	40	13	32	22	0	67	5	8	10	0	23	11	134	3	0	148	278	0
16:30	50	10	2	0	62	8	28	18	0	54	2	14	9	0	25	20	109	1	0	130	271	0
16:45	25	16	3	0	44	12	45	21	0	78	1	17	3	0	21	12	105	3	0	120	263	0
Total	116	53	15	0	184	41	141	76	0	258	11	52	28	0	91	54	467	12	0	533	1066	0
17:00	23	19	4	0	46	10	42	15	0	67	2	12	12	0	26	8	149	6	0	163	302	0
17:15	28	17	5	0	50	11	57	19	0	87	3	13	9	0	25	12	106	5	0	123	285	0
17:30	22	11	3	0	36	10	37	15	0	62	2	10	3	0	15	11	125	3	0	139	252	0
17:45	20	11	4	0	35	7	36	16	0	59	4	12	8	0	24	4	110	4	0	118	236	0
Total	93	58	16	0	167	38	172	65	0	275	11	47	32	0	90	35	490	18	0	543	1075	0
Grand Total	364	164	130	0	658	151	898	239	0	1288	45	189	129	0	363	155	1374	46	0	1575	3884	0
Apprch %	55.3%	24.9%	19.8%	0.0%		11.7%	69.7%	18.6%	0.0%		12.4%	52.1%	35.5%	0.0%		9.8%	87.2%	2.9%	0.0%			
Total %	9.4%	4.2%	3.3%	0.0%	16.9%	3.9%	23.1%	6.2%	0.0%	33.2%	1.2%	4.9%	3.3%	0.0%	9.3%	4.0%	35.4%	1.2%	0.0%	40.6%	100.0%	

AM PEAK HOUR	Faith Home Rd Southbound					Keyes Rd Westbound					Faith Home Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	16	10	14	0	40	9	101	9	0	119	3	16	5	0	24	8	57	1	0	66	249
7:30	30	7	14	0	51	10	76	17	0	103	4	18	6	0	28	7	60	2	0	69	251
7:45	24	8	16	0	48	7	89	19	0	115	3	13	9	0	25	15	60	0	0	75	263
8:00	23	3	11	0	37	11	72	11	0	94	0	10	7	0	17	12	44	2	0	58	206
Total Volume	93	28	55	0	176	37	338	56	0	431	10	57	27	0	94	42	221	5	0	268	969
% App Total	52.8%	15.9%	31.3%	0.0%		8.6%	78.4%	13.0%	0.0%		10.6%	60.6%	28.7%	0.0%		15.7%	82.5%	1.9%	0.0%		
PHF	.775	.700	.859	.000	.863	.841	.837	.737	.000	.905	.625	.792	.750	.000	.839	.700	.921	.625	.000	.893	.921

PM PEAK HOUR	Faith Home Rd Southbound					Keyes Rd Westbound					Faith Home Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	50	10	2	0	62	8	28	18	0	54	2	14	9	0	25	20	109	1	0	130	271
16:45	25	16	3	0	44	12	45	21	0	78	1	17	3	0	21	12	105	3	0	120	263
17:00	23	19	4	0	46	10	42	15	0	67	2	12	12	0	26	8	149	6	0	163	302
17:15	28	17	5	0	50	11	57	19	0	87	3	13	9	0	25	12	106	5	0	123	285
Total Volume	126	62	14	0	202	41	172	73	0	286	8	56	33	0	97	52	469	15	0	536	1121
% App Total	62.4%	30.7%	6.9%	0.0%		14.3%	60.1%	25.5%	0.0%		8.2%	57.7%	34.0%	0.0%		9.7%	87.5%	2.8%	0.0%		
PHF	.630	.816	.700	.000	.815	.854	.754	.869	.000	.822	.667	.824	.688	.000	.933	.650	.787	.625	.000	.822	.928

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-002
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	Foote Rd Southbound					Keyes Rd Westbound					Foote Rd Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	1	1	0	0	2	2	104	0	0	106	3	0	4	0	7	0	59	1	0	60	175	0
7:15	1	0	0	0	1	3	123	1	0	127	4	0	5	0	9	0	78	0	0	78	215	0
7:30	0	0	0	0	0	2	108	0	1	111	6	0	4	0	10	0	96	1	0	97	218	1
7:45	1	1	0	0	2	10	118	1	0	129	11	0	7	0	18	0	103	3	0	106	255	0
Total	3	2	0	0	5	17	453	2	1	473	24	0	20	0	44	0	336	5	0	341	863	1
8:00	0	0	0	0	0	4	105	0	0	109	5	0	4	0	9	0	82	2	0	84	202	0
8:15	0	0	0	0	0	3	83	0	0	86	5	0	4	0	9	0	73	2	0	75	170	0
8:30	0	0	0	0	0	3	89	0	0	92	3	0	6	0	9	0	79	3	0	82	183	0
8:45	0	0	0	0	0	5	77	0	1	83	3	0	8	0	11	0	79	2	0	81	175	1
Total	0	0	0	0	0	15	354	0	1	370	16	0	22	0	38	0	313	9	0	322	730	1
16:00	2	0	0	0	2	8	52	0	0	60	6	1	7	0	14	0	164	3	0	167	243	0
16:15	2	0	0	0	2	6	66	0	1	73	5	0	3	0	8	0	155	4	0	159	242	1
16:30	4	0	0	0	4	10	54	4	5	73	2	0	4	0	6	0	181	3	0	184	267	5
16:45	1	0	0	0	1	4	73	1	1	79	1	0	7	0	8	0	153	8	0	161	249	1
Total	9	0	0	0	9	28	245	5	7	285	14	1	21	0	36	0	653	18	0	671	1001	7
17:00	2	0	0	0	2	5	69	3	0	77	3	0	7	0	10	1	170	3	0	174	263	0
17:15	2	0	2	0	4	12	77	2	6	97	5	0	11	0	16	0	169	3	0	172	289	6
17:30	0	0	0	0	0	5	62	1	0	68	3	0	6	0	9	0	142	3	0	145	222	0
17:45	0	0	0	0	0	1	62	0	0	63	0	0	4	0	4	0	144	2	0	146	213	0
Total	4	0	2	0	6	23	270	6	6	305	11	0	28	0	39	1	625	11	0	637	987	6
Grand Total	16	2	2	0	20	83	1322	13	15	1433	65	1	91	0	157	1	1927	43	0	1971	3581	15
Apprch %	80.0%	10.0%	10.0%	0.0%		5.8%	92.3%	0.9%	1.0%		41.4%	0.6%	58.0%	0.0%		0.1%	97.8%	2.2%	0.0%			
Total %	0.4%	0.1%	0.1%	0.0%	0.6%	2.3%	36.9%	0.4%	0.4%	40.0%	1.8%	0.0%	2.5%	0.0%	4.4%	0.0%	53.8%	1.2%	0.0%	55.0%	100.0%	

AM PEAK HOUR	Foote Rd Southbound					Keyes Rd Westbound					Foote Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	1	0	0	0	1	3	123	1	0	127	4	0	5	0	9	0	78	0	0	78	215
7:30	0	0	0	0	0	2	108	0	1	111	6	0	4	0	10	0	96	1	0	97	218
7:45	1	1	0	0	2	10	118	1	0	129	11	0	7	0	18	0	103	3	0	106	255
8:00	0	0	0	0	0	4	105	0	0	109	5	0	4	0	9	0	82	2	0	84	202
Total Volume	2	1	0	0	3	19	454	2	1	476	26	0	20	0	46	0	359	6	0	365	890
% App Total	66.7%	33.3%	0.0%	0.0%		4.0%	95.4%	0.4%	0.2%		56.5%	0.0%	43.5%	0.0%		0.0%	98.4%	1.6%	0.0%		
PHF	.500	.250	.000	.000	.375	.475	.923	.500	.250	.922	.591	.000	.714	.000	.639	.000	.871	.500	.000	.861	.873

PM PEAK HOUR	Foote Rd Southbound					Keyes Rd Westbound					Foote Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	4	0	0	0	4	10	54	4	5	73	2	0	4	0	6	0	181	3	0	184	267
16:45	1	0	0	0	1	4	73	1	1	79	1	0	7	0	8	0	153	8	0	161	249
17:00	2	0	0	0	2	5	69	3	0	77	3	0	7	0	10	1	170	3	0	174	263
17:15	2	0	2	0	4	12	77	2	6	97	5	0	11	0	16	0	169	3	0	172	289
Total Volume	9	0	2	0	11	31	273	10	12	326	11	0	29	0	40	1	673	17	0	691	1068
% App Total	81.8%	0.0%	18.2%	0.0%		9.5%	83.7%	3.1%	3.7%		27.5%	0.0%	72.5%	0.0%		0.1%	97.4%	2.5%	0.0%		
PHF	.563	.000	.250	.000	.688	.646	.886	.625	.500	.840	.550	.000	.659	.000	.625	.250	.930	.531	.000	.939	.924

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-003
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	SR 99 SB Ramps Southbound					Keyes Rd Westbound					SR 99 SB Ramps Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	21	0	14	0	35	47	92	0	0	139	0	0	0	0	0	0	36	30	0	66	240	0
7:15	25	0	16	0	41	63	111	0	0	174	0	0	0	0	0	0	45	37	0	82	297	0
7:30	24	0	10	0	34	58	101	0	0	159	0	0	0	0	0	0	48	54	0	102	295	0
7:45	20	0	13	0	33	63	116	0	0	179	0	0	0	0	0	0	57	53	0	110	322	0
Total	90	0	53	0	143	231	420	0	0	651	0	0	0	0	0	0	186	174	0	360	1154	0
8:00	23	0	13	0	36	57	100	0	0	157	0	0	0	0	0	0	35	49	0	84	277	0
8:15	24	1	14	0	39	72	68	0	0	140	0	0	0	0	0	0	39	40	0	79	258	0
8:30	30	0	16	0	46	44	73	0	0	117	0	0	0	0	0	0	43	38	0	81	244	0
8:45	24	1	15	0	40	61	71	0	0	132	0	0	0	0	0	0	52	38	0	90	262	0
Total	101	2	58	0	161	234	312	0	0	546	0	0	0	0	0	0	169	165	0	334	1041	0
16:00	33	1	10	0	44	40	49	0	0	89	0	0	0	0	0	0	75	98	0	173	306	0
16:15	42	0	20	0	62	45	54	0	0	99	0	0	0	0	0	0	74	88	0	162	323	0
16:30	39	0	25	0	64	56	47	0	0	103	0	0	0	0	0	0	82	110	0	192	359	0
16:45	48	1	13	0	62	41	66	0	0	107	0	0	0	0	0	0	52	111	0	163	332	0
Total	162	2	68	0	232	182	216	0	0	398	0	0	0	0	0	0	283	407	0	690	1320	0
17:00	35	1	14	0	50	45	64	0	0	109	0	0	0	0	0	0	72	102	0	174	333	0
17:15	37	0	29	0	66	51	72	0	0	123	0	0	0	0	0	0	91	102	0	193	382	0
17:30	53	1	9	0	63	37	54	0	0	91	0	0	0	0	0	0	65	82	0	147	301	0
17:45	40	3	6	0	49	52	59	0	0	111	0	0	0	0	0	0	71	78	0	149	309	0
Total	165	5	58	0	228	185	249	0	0	434	0	0	0	0	0	0	299	364	0	663	1325	0
Grand Total	518	9	237	0	764	832	1197	0	0	2029	0	0	0	0	0	0	937	1110	0	2047	4840	0
Apprch %	67.8%	1.2%	31.0%	0.0%		41.0%	59.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	45.8%	54.2%	0.0%			
Total %	10.7%	0.2%	4.9%	0.0%	15.8%	17.2%	24.7%	0.0%	0.0%	41.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.4%	22.9%	0.0%	42.3%	100.0%	

AM PEAK HOUR	SR 99 SB Ramps Southbound					Keyes Rd Westbound					SR 99 SB Ramps Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	25	0	16	0	41	63	111	0	0	174	0	0	0	0	0	0	45	37	0	82	297
7:30	24	0	10	0	34	58	101	0	0	159	0	0	0	0	0	0	48	54	0	102	295
7:45	20	0	13	0	33	63	116	0	0	179	0	0	0	0	0	0	57	53	0	110	322
8:00	23	0	13	0	36	57	100	0	0	157	0	0	0	0	0	0	35	49	0	84	277
Total Volume	92	0	52	0	144	241	428	0	0	669	0	0	0	0	0	0	185	193	0	378	1191
% App Total	63.9%	0.0%	36.1%	0.0%		36.0%	64.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	48.9%	51.1%	0.0%		
PHF	.920	.000	.813	.000	.878	.956	.922	.000	.000	.934	.000	.000	.000	.000	.000	.000	.811	.894	.000	.859	.925

PM PEAK HOUR	SR 99 SB Ramps Southbound					Keyes Rd Westbound					SR 99 SB Ramps Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	39	0	25	0	64	56	47	0	0	103	0	0	0	0	0	0	82	110	0	192	359
16:45	48	1	13	0	62	41	66	0	0	107	0	0	0	0	0	0	52	111	0	163	332
17:00	35	1	14	0	50	45	64	0	0	109	0	0	0	0	0	0	72	102	0	174	333
17:15	37	0	29	0	66	51	72	0	0	123	0	0	0	0	0	0	91	102	0	193	382
Total Volume	159	2	81	0	242	193	249	0	0	442	0	0	0	0	0	0	297	425	0	722	1406
% App Total	65.7%	0.8%	33.5%	0.0%		43.7%	56.3%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	41.1%	58.9%	0.0%		
PHF	.828	.500	.698	.000	.917	.862	.865	.000	.000	.898	.000	.000	.000	.000	.000	.000	.816	.957	.000	.935	.920

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-004
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	SR 99 NB Ramps Southbound					Keyes Rd Westbound					SR 99 NB Ramps Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	0	0	0	0	0	97	46	0	143	42	0	37	0	79	11	45	0	0	56	278	0
7:15	0	0	0	0	0	0	136	87	0	223	38	0	33	0	71	13	57	0	0	70	364	0
7:30	0	0	0	0	0	0	122	102	0	224	35	0	31	0	66	9	63	0	0	72	362	0
7:45	0	0	0	0	0	0	136	70	0	206	41	0	46	0	87	16	61	0	0	77	370	0
Total	0	0	0	0	0	0	491	305	0	796	156	0	147	0	303	49	226	0	0	275	1374	0
8:00	0	0	0	0	0	0	121	56	0	177	34	0	61	0	95	14	45	0	0	59	331	0
8:15	0	0	0	0	0	0	117	41	0	158	31	0	40	0	71	15	47	0	0	62	291	0
8:30	0	0	0	0	0	0	78	41	0	119	38	0	44	0	82	14	61	0	0	75	276	0
8:45	0	0	0	0	0	0	105	31	0	136	26	0	28	0	54	22	50	0	0	72	262	0
Total	0	0	0	0	0	0	421	169	0	590	129	0	173	0	302	65	203	0	0	268	1160	0
16:00	0	0	0	0	0	0	66	35	0	101	23	0	79	0	102	16	93	0	0	109	312	0
16:15	0	0	0	0	0	0	73	30	0	103	24	0	68	0	92	17	98	0	0	115	310	0
16:30	0	0	0	0	0	0	81	37	0	118	24	0	60	0	84	19	102	0	0	121	323	0
16:45	0	0	0	0	0	0	75	37	0	112	31	0	65	0	96	6	91	0	0	97	305	0
Total	0	0	0	0	0	0	295	139	0	434	102	0	272	0	374	58	384	0	0	442	1250	0
17:00	0	0	0	0	0	0	83	40	0	123	29	0	58	0	87	14	96	0	0	110	320	0
17:15	0	0	0	0	0	0	86	28	0	114	35	0	64	0	99	10	118	0	0	128	341	0
17:30	0	0	0	0	0	0	63	47	0	110	21	0	82	0	103	7	112	0	0	119	332	0
17:45	0	0	0	0	0	0	88	28	0	116	26	0	49	0	75	12	95	0	0	107	298	0
Total	0	0	0	0	0	0	320	143	0	463	111	0	253	0	364	43	421	0	0	464	1291	0
Grand Total	0	0	0	0	0	0	1527	756	0	2283	498	0	845	0	1343	215	1234	0	0	1449	5075	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	66.9%	33.1%	0.0%		37.1%	0.0%	62.9%	0.0%		14.8%	85.2%	0.0%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.1%	14.9%	0.0%	45.0%	9.8%	0.0%	16.7%	0.0%	26.5%	4.2%	24.3%	0.0%	0.0%	28.6%	100.0%	

AM PEAK HOUR	SR 99 NB Ramps Southbound					Keyes Rd Westbound					SR 99 NB Ramps Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	0	0	0	0	0	0	136	87	0	223	38	0	33	0	71	13	57	0	0	70	364
7:30	0	0	0	0	0	0	122	102	0	224	35	0	31	0	66	9	63	0	0	72	362
7:45	0	0	0	0	0	0	136	70	0	206	41	0	46	0	87	16	61	0	0	77	370
8:00	0	0	0	0	0	0	121	56	0	177	34	0	61	0	95	14	45	0	0	59	331
Total Volume	0	0	0	0	0	0	515	315	0	830	148	0	171	0	319	52	226	0	0	278	1427
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	62.0%	38.0%	0.0%		46.4%	0.0%	53.6%	0.0%		18.7%	81.3%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.947	.772	.000	.926	.902	.000	.701	.000	.839	.813	.897	.000	.000	.903	.964

PM PEAK HOUR	SR 99 NB Ramps Southbound					Keyes Rd Westbound					SR 99 NB Ramps Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	0	0	0	0	0	0	75	37	0	112	31	0	65	0	96	6	91	0	0	97	305
17:00	0	0	0	0	0	0	83	40	0	123	29	0	58	0	87	14	96	0	0	110	320
17:15	0	0	0	0	0	0	86	28	0	114	35	0	64	0	99	10	118	0	0	128	341
17:30	0	0	0	0	0	0	63	47	0	110	21	0	82	0	103	7	112	0	0	119	332
Total Volume	0	0	0	0	0	0	307	152	0	459	116	0	269	0	385	37	417	0	0	454	1298
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	66.9%	33.1%	0.0%		30.1%	0.0%	69.9%	0.0%		8.1%	91.9%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.892	.809	.000	.933	.829	.000	.820	.000	.934	.661	.883	.000	.000	.887	.952

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-005
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	9th St/Golden State Blvd Southbound					Nunes Rd Westbound					9th St/Golden State Blvd Northbound					Nunes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	3	29	0	0	32	22	7	6	0	35	16	7	5	0	28	0	1	8	0	9	104	0
7:15	3	49	1	0	53	31	9	8	0	48	24	14	4	0	42	0	2	13	0	15	158	0
7:30	6	61	3	0	70	34	10	6	0	50	18	21	6	1	46	0	0	18	0	18	184	1
7:45	4	36	7	0	47	17	15	10	0	42	35	43	5	0	83	2	4	15	0	21	193	0
Total	16	175	11	0	202	104	41	30	0	175	93	85	20	1	199	2	7	54	0	63	639	1
8:00	8	33	1	0	42	13	3	5	0	21	10	20	5	0	35	5	5	30	0	40	138	0
8:15	8	42	3	0	53	12	1	10	0	23	8	26	5	0	39	0	2	15	0	17	132	0
8:30	11	53	2	0	66	16	3	15	0	34	8	26	2	0	36	0	3	12	0	15	151	0
8:45	3	29	0	0	32	11	2	2	0	15	11	14	2	0	27	0	1	15	0	16	90	0
Total	30	157	6	0	193	52	9	32	0	93	37	86	14	0	137	5	11	72	0	88	511	0
16:00	4	20	0	0	24	7	4	6	0	17	18	31	8	0	57	3	6	22	0	31	129	0
16:15	3	19	0	0	22	11	3	4	0	18	11	22	5	0	38	1	8	22	0	31	109	0
16:30	1	20	0	0	21	14	2	3	0	19	6	27	4	0	37	0	5	15	0	20	97	0
16:45	1	16	0	0	17	15	3	2	0	20	18	21	5	0	44	0	6	27	0	33	114	0
Total	9	75	0	0	84	47	12	15	0	74	53	101	22	0	176	4	25	86	0	115	449	0
17:00	2	27	2	0	31	14	4	4	0	22	7	25	3	0	35	2	7	19	0	28	116	0
17:15	2	21	2	0	25	16	4	3	0	23	7	37	7	0	51	0	2	12	0	14	113	0
17:30	4	28	0	0	32	11	3	5	0	19	14	36	7	0	57	2	1	15	0	18	126	0
17:45	2	23	0	0	25	11	4	5	0	20	10	21	1	0	32	2	0	23	0	25	102	0
Total	10	99	4	0	113	52	15	17	0	84	38	119	18	0	175	6	10	69	0	85	457	0
Grand Total	65	506	21	0	592	255	77	94	0	426	221	391	74	1	687	17	53	281	0	351	2056	1
Apprch %	11.0%	85.5%	3.5%	0.0%		59.9%	18.1%	22.1%	0.0%		32.2%	56.9%	10.8%	0.1%		4.8%	15.1%	80.1%	0.0%			
Total %	3.2%	24.6%	1.0%	0.0%	28.8%	12.4%	3.7%	4.6%	0.0%	20.7%	10.7%	19.0%	3.6%	0.0%	33.4%	0.8%	2.6%	13.7%	0.0%	17.1%	100.0%	

AM PEAK HOUR	9th St/Golden State Blvd Southbound					Nunes Rd Westbound					9th St/Golden State Blvd Northbound					Nunes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	3	49	1	0	53	31	9	8	0	48	24	14	4	0	42	0	2	13	0	15	158
7:30	6	61	3	0	70	34	10	6	0	50	18	21	6	1	46	0	0	18	0	18	184
7:45	4	36	7	0	47	17	15	10	0	42	35	43	5	0	83	2	4	15	0	21	193
8:00	8	33	1	0	42	13	3	5	0	21	10	20	5	0	35	5	5	30	0	40	138
Total Volume	21	179	12	0	212	95	37	29	0	161	87	98	20	1	206	7	11	76	0	94	673
% App Total	9.9%	84.4%	5.7%	0.0%		59.0%	23.0%	18.0%	0.0%		42.2%	47.6%	9.7%	0.5%		7.4%	11.7%	80.9%	0.0%		
PHF	.656	.734	.429	.000	.757	.699	.617	.725	.000	.805	.621	.570	.833	.250	.620	.350	.550	.633	.000	.588	.872

PM PEAK HOUR	9th St/Golden State Blvd Southbound					Nunes Rd Westbound					9th St/Golden State Blvd Northbound					Nunes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	1	16	0	0	17	15	3	2	0	20	18	21	5	0	44	0	6	27	0	33	114
17:00	2	27	2	0	31	14	4	4	0	22	7	25	3	0	35	2	7	19	0	28	116
17:15	2	21	2	0	25	16	4	3	0	23	7	37	7	0	51	0	2	12	0	14	113
17:30	4	28	0	0	32	11	3	5	0	19	14	36	7	0	57	2	1	15	0	18	126
Total Volume	9	92	4	0	105	56	14	14	0	84	46	119	22	0	187	4	16	73	0	93	469
% App Total	8.6%	87.6%	3.8%	0.0%		66.7%	16.7%	16.7%	0.0%		24.6%	63.6%	11.8%	0.0%		4.3%	17.2%	78.5%	0.0%		
PHF	.563	.821	.500	.000	.820	.875	.875	.700	.000	.913	.639	.804	.786	.000	.820	.500	.571	.676	.000	.705	.931

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-006
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	Golden State Blvd Southbound					Keyes Rd Westbound					Golden State Blvd Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	1	29	32	0	62	15	87	0	0	102	28	10	8	0	46	16	49	19	0	84	294	0
7:15	2	45	43	0	90	9	110	0	0	119	64	23	16	0	103	17	54	20	0	91	403	0
7:30	2	41	61	0	104	8	111	0	0	119	53	34	23	0	110	16	48	25	0	89	422	0
7:45	1	27	50	0	78	15	95	3	0	113	60	42	19	0	121	26	65	19	0	110	422	0
Total	6	142	186	0	334	47	403	3	0	453	205	109	66	0	380	75	216	83	0	374	1541	0
8:00	2	27	43	0	72	8	94	1	0	103	42	25	15	0	82	22	71	16	0	109	366	0
8:15	3	25	45	0	73	6	77	2	0	85	33	23	15	0	71	12	51	20	0	83	312	0
8:30	2	31	40	0	73	10	57	0	0	67	25	14	7	0	46	27	60	21	0	108	294	0
8:45	2	17	41	0	60	12	75	0	0	87	23	14	13	0	50	11	36	27	0	74	271	0
Total	9	100	169	0	278	36	303	3	0	342	123	76	50	0	249	72	218	84	0	374	1243	0
16:00	2	28	22	0	52	13	50	0	0	63	30	28	23	0	81	19	114	36	0	169	365	0
16:15	4	15	27	0	46	11	46	0	0	57	29	16	17	0	62	34	105	29	0	168	333	0
16:30	2	21	29	0	52	13	58	2	0	73	30	13	19	0	62	20	97	48	0	165	352	0
16:45	5	25	24	0	54	21	59	1	0	81	26	19	17	0	62	24	99	31	0	154	351	0
Total	13	89	102	0	204	58	213	3	0	274	115	76	76	0	267	97	415	144	0	656	1401	0
17:00	2	26	34	0	62	11	53	1	0	65	37	24	17	0	78	15	114	34	0	163	368	0
17:15	2	22	32	0	56	23	62	1	0	86	28	24	17	0	69	21	99	44	0	164	375	0
17:30	1	19	26	1	47	12	42	1	0	55	36	18	24	0	78	37	127	39	0	203	383	1
17:45	0	21	33	0	54	8	56	0	0	64	30	18	12	0	60	18	84	40	0	142	320	0
Total	5	88	125	1	219	54	213	3	0	270	131	84	70	0	285	91	424	157	0	672	1446	1
Grand Total	33	419	582	1	1035	195	1132	12	0	1339	574	345	262	0	1181	335	1273	468	0	2076	5631	1
Apprch %	3.2%	40.5%	56.2%	0.1%		14.6%	84.5%	0.9%	0.0%		48.6%	29.2%	22.2%	0.0%		16.1%	61.3%	22.5%	0.0%			
Total %	0.6%	7.4%	10.3%	0.0%	18.4%	3.5%	20.1%	0.2%	0.0%	23.8%	10.2%	6.1%	4.7%	0.0%	21.0%	5.9%	22.6%	8.3%	0.0%	36.9%	100.0%	

AM PEAK HOUR	Golden State Blvd Southbound					Keyes Rd Westbound					Golden State Blvd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	2	45	43	0	90	9	110	0	0	119	64	23	16	0	103	17	54	20	0	91	403
7:30	2	41	61	0	104	8	111	0	0	119	53	34	23	0	110	16	48	25	0	89	422
7:45	1	27	50	0	78	15	95	3	0	113	60	42	19	0	121	26	65	19	0	110	422
8:00	2	27	43	0	72	8	94	1	0	103	42	25	15	0	82	22	71	16	0	109	366
Total Volume	7	140	197	0	344	40	410	4	0	454	219	124	73	0	416	81	238	80	0	399	1613
% App Total	2.0%	40.7%	57.3%	0.0%		8.8%	90.3%	0.9%	0.0%		52.6%	29.8%	17.5%	0.0%		20.3%	59.6%	20.1%	0.0%		
PHF	.875	.778	.807	.000	.827	.667	.923	.333	.000	.954	.855	.738	.793	.000	.860	.779	.838	.800	.000	.907	.956

PM PEAK HOUR	Golden State Blvd Southbound					Keyes Rd Westbound					Golden State Blvd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	5	25	24	0	54	21	59	1	0	81	26	19	17	0	62	24	99	31	0	154	351
17:00	2	26	34	0	62	11	53	1	0	65	37	24	17	0	78	15	114	34	0	163	368
17:15	2	22	32	0	56	23	62	1	0	86	28	24	17	0	69	21	99	44	0	164	375
17:30	1	19	26	1	47	12	42	1	0	55	36	18	24	0	78	37	127	39	0	203	383
Total Volume	10	92	116	1	219	67	216	4	0	287	127	85	75	0	287	97	439	148	0	684	1477
% App Total	4.6%	42.0%	53.0%	0.5%		23.3%	75.3%	1.4%	0.0%		44.3%	29.6%	26.1%	0.0%		14.2%	64.2%	21.6%	0.0%		
PHF	.500	.885	.853	.250	.883	.728	.871	1.000	.000	.834	.858	.885	.781	.000	.920	.655	.864	.841	.000	.842	.964

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-007
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	S Washington Rd Southbound					Nunes Rd Westbound					S Washington Rd Northbound					Nunes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	10	0	21	0	31	0	15	10	0	25	0	0	0	0	0	2	4	0	0	6	62	0
7:15	16	0	35	0	51	0	13	14	0	27	0	0	0	0	0	12	0	0	0	12	90	0
7:30	18	0	38	0	56	0	11	15	0	26	0	0	0	0	0	9	9	0	0	18	100	0
7:45	8	0	21	0	29	0	21	12	0	33	0	0	0	0	0	6	1	0	0	7	69	0
Total	52	0	115	0	167	0	60	51	0	111	0	0	0	0	0	29	14	0	0	43	321	0
8:00	12	0	13	0	25	0	12	17	0	29	0	0	0	0	0	8	10	0	0	18	72	0
8:15	16	0	11	0	27	0	8	29	0	37	0	0	0	0	0	6	9	0	0	15	79	0
8:30	9	0	11	0	20	0	22	17	0	39	0	0	0	0	0	4	7	0	0	11	70	0
8:45	9	0	13	0	22	0	3	12	0	15	0	0	0	0	0	7	4	0	0	11	48	0
Total	46	0	48	0	94	0	45	75	0	120	0	0	0	0	0	25	30	0	0	55	269	0
16:00	9	0	8	0	17	0	10	24	0	34	0	0	0	0	0	14	2	0	0	16	67	0
16:15	15	0	11	0	26	0	6	26	0	32	0	0	0	0	0	11	7	0	0	18	76	0
16:30	6	0	10	0	16	0	9	17	0	26	0	0	0	0	0	7	3	0	0	10	52	0
16:45	15	0	15	0	30	0	5	23	0	28	0	0	0	0	0	10	2	0	0	12	70	0
Total	45	0	44	0	89	0	30	90	0	120	0	0	0	0	0	42	14	0	0	56	265	0
17:00	11	0	13	0	24	0	9	17	0	26	0	0	0	0	0	4	8	0	0	12	62	0
17:15	10	0	12	0	22	0	9	16	0	25	0	0	0	0	0	7	4	0	0	11	58	0
17:30	11	0	15	0	26	0	8	32	0	40	0	0	0	0	0	8	3	0	0	11	77	0
17:45	8	0	9	0	17	0	9	20	0	29	0	0	0	0	0	4	0	0	0	4	50	0
Total	40	0	49	0	89	0	35	85	0	120	0	0	0	0	0	23	15	0	0	38	247	0
Grand Total	183	0	256	0	439	0	170	301	0	471	0	0	0	0	0	119	73	0	0	192	1102	0
Apprch %	41.7%	0.0%	58.3%	0.0%		0.0%	36.1%	63.9%	0.0%		0.0%	0.0%	0.0%	0.0%		62.0%	38.0%	0.0%	0.0%			
Total %	16.6%	0.0%	23.2%	0.0%	39.8%	0.0%	15.4%	27.3%	0.0%	42.7%	0.0%	0.0%	0.0%	0.0%	0.0%	10.8%	6.6%	0.0%	0.0%	17.4%	100.0%	

AM PEAK HOUR	S Washington Rd Southbound					Nunes Rd Westbound					S Washington Rd Northbound					Nunes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	16	0	35	0	51	0	13	14	0	27	0	0	0	0	0	12	0	0	0	12	90
7:30	18	0	38	0	56	0	11	15	0	26	0	0	0	0	0	9	9	0	0	18	100
7:45	8	0	21	0	29	0	21	12	0	33	0	0	0	0	0	6	1	0	0	7	69
8:00	12	0	13	0	25	0	12	17	0	29	0	0	0	0	0	8	10	0	0	18	72
Total Volume	54	0	107	0	161	0	57	58	0	115	0	0	0	0	0	35	20	0	0	55	331
% App Total	33.5%	0.0%	66.5%	0.0%		0.0%	49.6%	50.4%	0.0%		0.0%	0.0%	0.0%	0.0%		63.6%	36.4%	0.0%	0.0%		
PHF	.750	.000	.704	.000	.719	.000	.679	.853	.000	.871	.000	.000	.000	.000	.000	.729	.500	.000	.000	.764	.828

PM PEAK HOUR	S Washington Rd Southbound					Nunes Rd Westbound					S Washington Rd Northbound					Nunes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	15	0	15	0	30	0	5	23	0	28	0	0	0	0	0	10	2	0	0	12	70
17:00	11	0	13	0	24	0	9	17	0	26	0	0	0	0	0	4	8	0	0	12	62
17:15	10	0	12	0	22	0	9	16	0	25	0	0	0	0	0	7	4	0	0	11	58
17:30	11	0	15	0	26	0	8	32	0	40	0	0	0	0	0	8	3	0	0	11	77
Total Volume	47	0	55	0	102	0	31	88	0	119	0	0	0	0	0	29	17	0	0	46	267
% App Total	46.1%	0.0%	53.9%	0.0%		0.0%	26.1%	73.9%	0.0%		0.0%	0.0%	0.0%	0.0%		63.0%	37.0%	0.0%	0.0%		
PHF	.783	.000	.917	.000	.850	.000	.861	.688	.000	.744	.000	.000	.000	.000	.000	.725	.531	.000	.000	.958	.867

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-008
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	Nunes Rd Southbound					Keyes Rd Westbound					Nunes Rd Northbound					Keyes Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	6	0	10	0	16	0	90	10	0	100	0	0	0	0	0	10	48	0	0	58	174	0
7:15	6	0	7	0	13	0	117	15	0	132	0	0	0	0	0	11	62	0	0	73	218	0
7:30	10	0	12	1	23	0	104	9	0	113	0	0	0	0	0	8	63	0	0	71	207	1
7:45	9	0	7	0	16	0	106	19	0	125	0	0	0	0	0	13	73	0	0	86	227	0
Total	31	0	36	1	68	0	417	53	0	470	0	0	0	0	0	42	246	0	0	288	826	1
8:00	12	0	3	0	15	0	100	17	0	117	0	0	0	0	0	16	70	0	0	86	218	0
8:15	14	0	13	0	27	0	70	18	0	88	0	0	0	0	0	20	51	0	0	71	186	0
8:30	12	0	4	0	16	0	69	23	0	92	0	0	0	0	0	12	57	0	0	69	177	0
8:45	13	0	6	0	19	0	79	9	0	88	0	0	0	0	0	6	43	0	0	49	156	0
Total	51	0	26	0	77	0	318	67	0	385	0	0	0	0	0	54	221	0	0	275	737	0
16:00	6	1	6	0	13	0	58	13	0	71	0	0	0	0	0	23	110	0	0	133	217	0
16:15	11	0	9	0	20	0	46	7	0	53	0	0	0	0	0	29	103	0	0	132	205	0
16:30	7	1	6	0	14	0	70	12	0	82	0	0	0	0	0	13	107	0	0	120	216	0
16:45	9	1	13	0	23	0	66	9	0	75	0	0	0	0	0	19	118	0	0	137	235	0
Total	33	3	34	0	70	0	240	41	0	281	0	0	0	0	0	84	438	0	0	522	873	0
17:00	10	0	5	0	15	0	62	14	0	76	0	0	0	0	0	10	102	0	0	112	203	0
17:15	10	0	14	0	24	0	70	14	0	84	0	0	0	0	0	11	110	0	0	121	229	0
17:30	8	0	6	0	14	0	59	14	0	73	0	0	0	0	0	26	122	0	0	148	235	0
17:45	6	0	7	0	13	0	50	10	0	60	0	0	0	0	0	19	83	0	0	102	175	0
Total	34	0	32	0	66	0	241	52	0	293	0	0	0	0	0	66	417	0	0	483	842	0
Grand Total	149	3	128	1	281	0	1216	213	0	1429	0	0	0	0	0	246	1322	0	0	1568	3278	1
Apprch %	53.0%	1.1%	45.6%	0.4%		0.0%	85.1%	14.9%	0.0%		0.0%	0.0%	0.0%	0.0%		15.7%	84.3%	0.0%	0.0%			
Total %	4.5%	0.1%	3.9%	0.0%	8.6%	0.0%	37.1%	6.5%	0.0%	43.6%	0.0%	0.0%	0.0%	0.0%	0.0%	7.5%	40.3%	0.0%	0.0%	47.8%	100.0%	

AM PEAK HOUR	Nunes Rd Southbound					Keyes Rd Westbound					Nunes Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	6	0	7	0	13	0	117	15	0	132	0	0	0	0	0	11	62	0	0	73	218
7:30	10	0	12	1	23	0	104	9	0	113	0	0	0	0	0	8	63	0	0	71	207
7:45	9	0	7	0	16	0	106	19	0	125	0	0	0	0	0	13	73	0	0	86	227
8:00	12	0	3	0	15	0	100	17	0	117	0	0	0	0	0	16	70	0	0	86	218
Total Volume	37	0	29	1	67	0	427	60	0	487	0	0	0	0	0	48	268	0	0	316	870
% App Total	55.2%	0.0%	43.3%	1.5%		0.0%	87.7%	12.3%	0.0%		0.0%	0.0%	0.0%	0.0%		15.2%	84.8%	0.0%	0.0%		
PHF	.771	.000	.604	.250	.728	.000	.912	.789	.000	.922	.000	.000	.000	.000	.000	.750	.918	.000	.000	.919	.958

PM PEAK HOUR	Nunes Rd Southbound					Keyes Rd Westbound					Nunes Rd Northbound					Keyes Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	9	1	13	0	23	0	66	9	0	75	0	0	0	0	0	19	118	0	0	137	235
17:00	10	0	5	0	15	0	62	14	0	76	0	0	0	0	0	10	102	0	0	112	203
17:15	10	0	14	0	24	0	70	14	0	84	0	0	0	0	0	11	110	0	0	121	229
17:30	8	0	6	0	14	0	59	14	0	73	0	0	0	0	0	26	122	0	0	148	235
Total Volume	37	1	38	0	76	0	257	51	0	308	0	0	0	0	0	66	452	0	0	518	902
% App Total	48.7%	1.3%	50.0%	0.0%		0.0%	83.4%	16.6%	0.0%		0.0%	0.0%	0.0%	0.0%		12.7%	87.3%	0.0%	0.0%		
PHF	.925	.250	.679	.000	.792	.000	.918	.911	.000	.917	.000	.000	.000	.000	.000	.635	.926	.000	.000	.875	.960

ALL TRAFFIC DATA

City of Keyes
Totals and Uturns on Unshifted Tab
Bikes and Pedestrians on Bank 1 Tab
Heavy Trucks on Bank 2 Tab

(916) 771-8700
orders@atdtraffic.com

File Name : 19-07266-009
Date : 08/14/2019

Unshifted Count = All Vehicles & Uturns

	Golden State Blvd Southbound					Barnhart Rd Westbound					Golden State Blvd Northbound					Barnhart Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	23	0	0	23	1	0	4	0	5	0	54	1	0	55	0	0	0	0	0	83	0
7:15	1	41	0	0	42	1	0	1	0	2	0	81	0	0	81	0	0	0	0	0	125	0
7:30	1	58	0	1	60	0	0	3	0	3	0	95	1	0	96	0	0	0	0	0	159	1
7:45	1	32	0	0	33	5	0	3	0	8	0	121	0	1	122	0	0	0	0	0	163	1
Total	3	154	0	1	158	7	0	11	0	18	0	351	2	1	354	0	0	0	0	0	530	2
8:00	3	34	0	0	37	2	0	2	0	4	0	57	0	0	57	0	0	0	0	0	98	0
8:15	1	32	0	0	33	4	0	1	0	5	0	46	3	0	49	0	0	0	0	0	87	0
8:30	0	45	0	0	45	0	0	3	0	3	0	33	2	0	35	0	0	0	0	0	83	0
8:45	0	39	0	0	39	1	0	1	0	2	0	36	2	0	38	0	0	0	0	0	79	0
Total	4	150	0	0	154	7	0	7	0	14	0	172	7	0	179	0	0	0	0	0	347	0
16:00	3	52	0	0	55	1	0	4	0	5	0	46	2	0	48	0	0	0	0	0	108	0
16:15	2	41	0	0	43	0	0	2	0	2	0	42	1	0	43	0	0	0	0	0	88	0
16:30	2	64	0	0	66	0	0	1	0	1	0	31	0	0	31	0	0	0	0	0	98	0
16:45	0	57	0	0	57	1	0	0	0	1	0	45	1	0	46	0	0	0	0	0	104	0
Total	7	214	0	0	221	2	0	7	0	9	0	164	4	0	168	0	0	0	0	0	398	0
17:00	2	73	0	0	75	0	0	0	0	0	0	45	3	0	48	0	0	0	0	0	123	0
17:15	2	80	0	0	82	0	0	0	0	0	0	54	1	0	55	0	0	0	0	0	137	0
17:30	1	50	0	0	51	2	0	2	0	4	0	48	2	0	50	0	0	0	0	0	105	0
17:45	5	54	0	0	59	3	0	0	0	3	0	32	2	0	34	0	0	0	0	0	96	0
Total	10	257	0	0	267	5	0	2	0	7	0	179	8	0	187	0	0	0	0	0	461	0
Grand Total	24	775	0	1	800	21	0	27	0	48	0	866	21	1	888	0	0	0	0	0	1736	2
Apprch %	3.0%	96.9%	0.0%	0.1%		43.8%	0.0%	56.3%	0.0%		0.0%	97.5%	2.4%	0.1%		0.0%	0.0%	0.0%	0.0%			
Total %	1.4%	44.6%	0.0%	0.1%	46.1%	1.2%	0.0%	1.6%	0.0%	2.8%	0.0%	49.9%	1.2%	0.1%	51.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Golden State Blvd Southbound					Barnhart Rd Westbound					Golden State Blvd Northbound					Barnhart Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	1	41	0	0	42	1	0	1	0	2	0	81	0	0	81	0	0	0	0	0	125
7:30	1	58	0	1	60	0	0	3	0	3	0	95	1	0	96	0	0	0	0	0	159
7:45	1	32	0	0	33	5	0	3	0	8	0	121	0	1	122	0	0	0	0	0	163
8:00	3	34	0	0	37	2	0	2	0	4	0	57	0	0	57	0	0	0	0	0	98
Total Volume	6	165	0	1	172	8	0	9	0	17	0	354	1	1	356	0	0	0	0	0	545
% App Total	3.5%	95.9%	0.0%	0.6%		47.1%	0.0%	52.9%	0.0%		0.0%	99.4%	0.3%	0.3%		0.0%	0.0%	0.0%	0.0%		
PHF	.500	.711	.000	.250	.717	.400	.000	.750	.000	.531	.000	.731	.250	.250	.730	.000	.000	.000	.000	.000	.836

PM PEAK HOUR	Golden State Blvd Southbound					Barnhart Rd Westbound					Golden State Blvd Northbound					Barnhart Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	0	57	0	0	57	1	0	0	0	1	0	45	1	0	46	0	0	0	0	0	104
17:00	2	73	0	0	75	0	0	0	0	0	0	45	3	0	48	0	0	0	0	0	123
17:15	2	80	0	0	82	0	0	0	0	0	0	54	1	0	55	0	0	0	0	0	137
17:30	1	50	0	0	51	2	0	2	0	4	0	48	2	0	50	0	0	0	0	0	105
Total Volume	5	260	0	0	265	3	0	2	0	5	0	192	7	0	199	0	0	0	0	0	469
% App Total	1.9%	98.1%	0.0%	0.0%		60.0%	0.0%	40.0%	0.0%		0.0%	96.5%	3.5%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.625	.813	.000	.000	.808	.375	.000	.250	.000	.313	.000	.889	.583	.000	.905	.000	.000	.000	.000	.000	.856

Prepared by National Data & Surveying Services

In & Out Study

Location: Golden State Blvd @ Interstate Truck Center N Dwy
City: Turlock

Date: 8/14/2019
Day: Wednesday

15-Minute Summary			
TIME	**Inbound**	**Outbound**	**TOTAL**
7:00 AM	10	1	***11***
7:15 AM	3	1	***4***
7:30 AM	3	2	***5***
7:45 AM	7	2	***9***
8:00 AM	3	1	***4***
8:15 AM	1	1	***2***
8:30 AM	5	0	***5***
8:45 AM	8	4	***12***
Totals	***40***	***12***	***52***
4:00 PM	2	5	***7***
4:15 PM	0	3	***3***
4:30 PM	2	5	***7***
4:45 PM	0	8	***8***
5:00 PM	1	7	***8***
5:15 PM	0	4	***4***
5:30 PM	0	2	***2***
5:45 PM	0	6	***6***
Totals	***5***	***40***	***45***
Grand Total	***45***	***52***	***97***

Hourly Summary			
TIME	**Inbound**	**Outbound**	**TOTAL**
7:00 AM	23	6	***29***
8:00 AM	17	6	***23***
Totals	***40***	***12***	***52***
4:00 PM	4	21	***25***
5:00 PM	1	19	***20***
Totals	***5***	***40***	***45***
Grand Total	***45***	***52***	***97***

Prepared by National Data & Surveying Services

In & Out Study

Location: Golden State Blvd @ Interstate Truck Center S Dwy
City: Turlock

Date: 8/14/2019
Day: Wednesday

15-Minute Summary			
TIME	**Inbound**	**Outbound**	**TOTAL**
7:00 AM	3	0	***3***
7:15 AM	3	2	***5***
7:30 AM	7	1	***8***
7:45 AM	5	4	***9***
8:00 AM	1	2	***3***
8:15 AM	3	2	***5***
8:30 AM	3	1	***4***
8:45 AM	1	6	***7***
Totals	***26***	***18***	***44***
4:00 PM	0	7	***7***
4:15 PM	4	0	***4***
4:30 PM	1	4	***5***
4:45 PM	4	3	***7***
5:00 PM	4	4	***8***
5:15 PM	0	4	***4***
5:30 PM	0	1	***1***
5:45 PM	0	0	***0***
Totals	***13***	***23***	***36***
Grand Total	***39***	***41***	***80***

Hourly Summary			
TIME	**Inbound**	**Outbound**	**TOTAL**
7:00 AM	18	7	***25***
8:00 AM	8	11	***19***
Totals	***26***	***18***	***44***
4:00 PM	9	14	***23***
5:00 PM	4	9	***13***
Totals	***13***	***23***	***36***
Grand Total	***39***	***41***	***80***

National Data and Surveying Services

City of Modesto
All Vehicles & Uturns On Unshifted
Heavy Trucks On Bank 1
Nothing On Bank 2

(323) 782-0090
info@ndsdata.com

File Name : 17-7125-001 Faith Home Rd & SR 99 SB
Date : 3/1/2017

Unshifted Count = All Vehicles & Uturns

	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
7:00	0	722	0	0	722	0	0	0	0	0	0	1020	0	0	1020	0	0	0	0	0	1742	0
7:15	0	902	0	0	902	0	0	0	0	0	0	1379	0	0	1379	0	0	0	0	0	2281	0
7:30	0	1121	0	0	1121	0	0	0	0	0	0	1254	0	0	1254	0	0	0	0	0	2375	0
7:45	0	952	0	0	952	0	0	0	0	0	0	1155	0	0	1155	0	0	0	0	0	2107	0
Total	0	3697	0	0	3697	0	0	0	0	0	0	4808	0	0	4808	0	0	0	0	0	8505	0
8:00	0	760	0	0	760	0	0	0	0	0	0	986	0	0	986	0	0	0	0	0	1746	0
8:15	0	871	0	0	871	0	0	0	0	0	0	954	0	0	954	0	0	0	0	0	1825	0
8:30	0	910	0	0	910	0	0	0	0	0	0	851	0	0	851	0	0	0	0	0	1761	0
8:45	0	855	0	0	855	0	0	0	0	0	0	805	0	0	805	0	0	0	0	0	1660	0
Total	0	3396	0	0	3396	0	0	0	0	0	0	3596	0	0	3596	0	0	0	0	0	6992	0
16:00	0	1206	0	0	1206	0	0	0	0	0	0	1009	0	0	1009	0	0	0	0	0	2215	0
16:15	0	1244	0	0	1244	0	0	0	0	0	0	1123	0	0	1123	0	0	0	0	0	2367	0
16:30	0	1145	0	0	1145	0	0	0	0	0	0	1074	0	0	1074	0	0	0	0	0	2219	0
16:45	0	1231	0	0	1231	0	0	0	0	0	0	1143	0	0	1143	0	0	0	0	0	2374	0
Total	0	4826	0	0	4826	0	0	0	0	0	0	4349	0	0	4349	0	0	0	0	0	9175	0
17:00	0	1216	0	0	1216	0	0	0	0	0	0	1135	0	0	1135	0	0	0	0	0	2351	0
17:15	0	1179	0	0	1179	0	0	0	0	0	0	1059	0	0	1059	0	0	0	0	0	2238	0
17:30	0	1173	0	0	1173	0	0	0	0	0	0	998	0	0	998	0	0	0	0	0	2171	0
17:45	0	1177	0	0	1177	0	0	0	0	0	0	870	0	0	870	0	0	0	0	0	2047	0
Total	0	4745	0	0	4745	0	0	0	0	0	0	4062	0	0	4062	0	0	0	0	0	8807	0
Grand Total	0	16664	0	0	16664	0	0	0	0	0	0	16815	0	0	16815	0	0	0	0	0	33479	0
Apprch %	0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.0%	49.8%	0.0%	0.0%	49.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.2%	0.0%	0.0%	50.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
7:00	0	722	0	0	722	0	0	0	0	0	0	1020	0	0	1020	0	0	0	0	0	1742
7:15	0	902	0	0	902	0	0	0	0	0	0	1379	0	0	1379	0	0	0	0	0	2281
7:30	0	1121	0	0	1121	0	0	0	0	0	0	1254	0	0	1254	0	0	0	0	0	2375
7:45	0	952	0	0	952	0	0	0	0	0	0	1155	0	0	1155	0	0	0	0	0	2107
Total Volume	0	3697	0	0	3697	0	0	0	0	0	0	4808	0	0	4808	0	0	0	0	0	8505
% App Total	0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.824	.000	.000	.824	.000	.000	.000	.000	.000	.000	.872	.000	.000	.872	.000	.000	.000	.000	.000	.895

PM PEAK HOUR	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:15 to 17:15																					
Peak Hour For Entire Intersection Begins at 16:15																					
16:15	0	1244	0	0	1244	0	0	0	0	0	0	1123	0	0	1123	0	0	0	0	0	2367
16:30	0	1145	0	0	1145	0	0	0	0	0	0	1074	0	0	1074	0	0	0	0	0	2219
16:45	0	1231	0	0	1231	0	0	0	0	0	0	1143	0	0	1143	0	0	0	0	0	2374
17:00	0	1216	0	0	1216	0	0	0	0	0	0	1135	0	0	1135	0	0	0	0	0	2351
Total Volume	0	4836	0	0	4836	0	0	0	0	0	0	4475	0	0	4475	0	0	0	0	0	9311
% App Total	0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.972	.000	.000	.972	.000	.000	.000	.000	.000	.000	.979	.000	.000	.979	.000	.000	.000	.000	.000	.981

National Data and Surveying Services

City of Modesto
All Vehicles & Uturns On Unshifted
Heavy Trucks On Bank 1
Nothing On Bank 2

(323) 782-0090
info@ndsdata.com

File Name : 17-7125-001 Faith Home Rd & SR 99 SB
Date : 3/1/2017

Bank 1 Count = Heavy Trucks

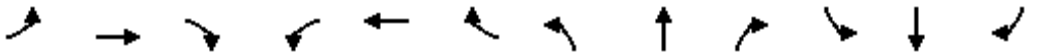
	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
7:00	0	112	0	0	112	0	0	0	0	0	0	90	0	0	90	0	0	0	0	0	202	0
7:15	0	100	0	0	100	0	0	0	0	0	0	107	0	0	107	0	0	0	0	0	207	0
7:30	0	102	0	0	102	0	0	0	0	0	0	79	0	0	79	0	0	0	0	0	181	0
7:45	0	109	0	0	109	0	0	0	0	0	0	112	0	0	112	0	0	0	0	0	221	0
Total	0	423	0	0	423	0	0	0	0	0	0	388	0	0	388	0	0	0	0	0	811	0
8:00	0	105	0	0	105	0	0	0	0	0	0	89	0	0	89	0	0	0	0	0	194	0
8:15	0	128	0	0	128	0	0	0	0	0	0	112	0	0	112	0	0	0	0	0	240	0
8:30	0	143	0	0	143	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	243	0
8:45	0	125	0	0	125	0	0	0	0	0	0	90	0	0	90	0	0	0	0	0	215	0
Total	0	501	0	0	501	0	0	0	0	0	0	391	0	0	391	0	0	0	0	0	892	0
16:00	0	86	0	0	86	0	0	0	0	0	0	71	0	0	71	0	0	0	0	0	157	0
16:15	0	85	0	0	85	0	0	0	0	0	0	80	0	0	80	0	0	0	0	0	165	0
16:30	0	96	0	0	96	0	0	0	0	0	0	82	0	0	82	0	0	0	0	0	178	0
16:45	0	67	0	0	67	0	0	0	0	0	0	66	0	0	66	0	0	0	0	0	133	0
Total	0	334	0	0	334	0	0	0	0	0	0	299	0	0	299	0	0	0	0	0	633	0
17:00	0	116	0	0	116	0	0	0	0	0	0	75	0	0	75	0	0	0	0	0	191	0
17:15	0	68	0	0	68	0	0	0	0	0	0	56	0	0	56	0	0	0	0	0	124	0
17:30	0	71	0	0	71	0	0	0	0	0	0	61	0	0	61	0	0	0	0	0	132	0
17:45	0	82	0	0	82	0	0	0	0	0	0	67	0	0	67	0	0	0	0	0	149	0
Total	0	337	0	0	337	0	0	0	0	0	0	259	0	0	259	0	0	0	0	0	596	0
Grand Total	0	1595	0	0	1595	0	0	0	0	0	0	1337	0	0	1337	0	0	0	0	0	2932	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	54.4%	0.0%		54.4%	0.0%	0.0%	0.0%		0.0%	0.0%	45.6%	0.0%		45.6%	0.0%	0.0%	0.0%		0.0%	100.0%	

AM PEAK HOUR	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:00 to 08:00																					
Peak Hour For Entire Intersection Begins at 07:00																					
7:00	0	112	0	0	112	0	0	0	0	0	0	90	0	0	90	0	0	0	0	0	202
7:15	0	100	0	0	100	0	0	0	0	0	0	107	0	0	107	0	0	0	0	0	207
7:30	0	102	0	0	102	0	0	0	0	0	0	79	0	0	79	0	0	0	0	0	181
7:45	0	109	0	0	109	0	0	0	0	0	0	112	0	0	112	0	0	0	0	0	221
Total Volume	0	423	0	0	423	0	0	0	0	0	0	388	0	0	388	0	0	0	0	0	811
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.944	.000		.944	.000	.000	.000		.000	.000	.866	.000		.866	.000	.000	.000		.000	.917

PM PEAK HOUR	Faith Home Rd Southbound					SR 99 SB Westbound					Faith Home Rd Northbound					SR 99 SB Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:15 to 17:15																					
Peak Hour For Entire Intersection Begins at 16:15																					
16:15	0	85	0	0	85	0	0	0	0	0	0	80	0	0	80	0	0	0	0	0	165
16:30	0	96	0	0	96	0	0	0	0	0	0	82	0	0	82	0	0	0	0	0	178
16:45	0	67	0	0	67	0	0	0	0	0	0	66	0	0	66	0	0	0	0	0	133
17:00	0	116	0	0	116	0	0	0	0	0	0	75	0	0	75	0	0	0	0	0	191
Total Volume	0	364	0	0	364	0	0	0	0	0	0	303	0	0	303	0	0	0	0	0	667
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.784	.000		.784	.000	.000	.000		.000	.000	.924	.000		.924	.000	.000	.000		.000	.873

Appendix B:
Intersection Operation Worksheets





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	221	5	37	338	56	10	57	27	93	28	55
Future Volume (veh/h)	42	221	5	37	338	56	10	57	27	93	28	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	240	4	40	367	58	11	62	29	101	30	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	65	580	10	62	528	83	17	95	45	195	152	45
Arrive On Green	0.04	0.37	0.37	0.04	0.36	0.36	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1541	1587	26	1654	1464	231	179	1008	471	1725	1338	401
Grp Volume(v), veh/h	46	0	244	40	0	425	102	0	0	101	0	39
Grp Sat Flow(s),veh/h/ln	1541	0	1614	1654	0	1695	1658	0	0	1725	0	1739
Q Serve(g_s), s	0.9	0.0	3.5	0.7	0.0	6.6	1.8	0.0	0.0	1.7	0.0	0.6
Cycle Q Clear(g_c), s	0.9	0.0	3.5	0.7	0.0	6.6	1.8	0.0	0.0	1.7	0.0	0.6
Prop In Lane	1.00		0.02	1.00		0.14	0.11		0.28	1.00		0.23
Lane Grp Cap(c), veh/h	65	0	590	62	0	612	157	0	0	195	0	197
V/C Ratio(X)	0.71	0.00	0.41	0.64	0.00	0.69	0.65	0.00	0.00	0.52	0.00	0.20
Avail Cap(c_a), veh/h	850	0	1675	912	0	1760	1721	0	0	1790	0	1805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	7.3	14.6	0.0	8.4	13.5	0.0	0.0	12.9	0.0	12.4
Incr Delay (d2), s/veh	13.1	0.0	0.5	10.5	0.0	1.4	4.5	0.0	0.0	2.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.7	0.4	0.0	1.5	0.7	0.0	0.0	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	7.8	25.2	0.0	9.8	18.0	0.0	0.0	15.0	0.0	12.9
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		290			465			102			140	
Approach Delay, s/veh		10.9			11.2			18.0			14.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.3	14.1		5.9	4.2	14.3		6.5				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	17.0	32.0		32.0	17.0	32.0		32.0				
Max Q Clear Time (g_c+I1), s	2.9	8.6		3.8	2.7	5.5		3.7				
Green Ext Time (p_c), s	0.1	2.5		0.5	0.0	1.3		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		12.2	
HCM 6th LOS		B	

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	359	6	20	458	2	26	0	20	2	1	0
Future Vol, veh/h	0	359	6	20	458	2	26	0	20	2	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	413	7	23	526	2	30	0	23	2	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	526	0	0	413	0	0	990	989	417	986	986	527
Stage 1	-	-	-	-	-	-	417	417	-	573	573	-
Stage 2	-	-	-	-	-	-	573	572	-	413	413	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	951	-	-	1094	-	-	225	247	636	174	193	443
Stage 1	-	-	-	-	-	-	613	591	-	407	413	-
Stage 2	-	-	-	-	-	-	505	504	-	506	496	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	951	-	-	1094	-	-	219	240	636	164	187	443
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	240	-	164	187	-
Stage 1	-	-	-	-	-	-	613	591	-	407	401	-
Stage 2	-	-	-	-	-	-	488	489	-	488	496	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	15.8	26.5
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	387	951	-	-	1094	-	-	171
HCM Lane V/C Ratio	0.137	-	-	-	0.021	-	-	0.02
HCM Control Delay (s)	15.8	0	-	-	8.4	0	-	26.5
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	188	193	241	428	0	0	0	0	92	0	52
Future Vol, veh/h	0	188	193	241	428	0	0	0	0	92	0	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	22	22	22
Mvmt Flow	0	204	210	262	465	0	0	0	0	100	0	57

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	414	0	0	1298	1403	465
Stage 1	-	-	-	-	-	-	989	989	-
Stage 2	-	-	-	-	-	-	309	414	-
Critical Hdwy	-	-	-	4.22	-	-	6.62	6.72	6.42
Critical Hdwy Stg 1	-	-	-	-	-	-	5.62	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.62	5.72	-
Follow-up Hdwy	-	-	-	2.308	-	-	3.698	4.198	3.498
Pot Cap-1 Maneuver	0	-	-	1093	-	0	162	127	558
Stage 1	0	-	-	-	-	0	331	300	-
Stage 2	0	-	-	-	-	0	701	560	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1093	-	-	123	0	558
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	0	-
Stage 1	-	-	-	-	-	-	252	0	-
Stage 2	-	-	-	-	-	-	701	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.4	102.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1093	-	171
HCM Lane V/C Ratio	-	-	0.24	-	0.915
HCM Control Delay (s)	-	-	9.3	-	102.1
HCM Lane LOS	-	-	A	-	F
HCM 95th %tile Q(veh)	-	-	0.9	-	6.8

Intersection	
Int Delay, s/veh	16

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	228	0	0	521	315	148	0	171	0	0	0
Future Vol, veh/h	52	228	0	0	521	315	148	0	171	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	22	22	22	9	9	9	18	18	18	2	2	2
Mvmt Flow	54	238	0	0	543	328	154	0	178	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	871	0	-	-	-	0	1053	1217	238
Stage 1	-	-	-	-	-	-	346	346	-
Stage 2	-	-	-	-	-	-	707	871	-
Critical Hdwy	4.32	-	-	-	-	-	6.58	6.68	6.38
Critical Hdwy Stg 1	-	-	-	-	-	-	5.58	5.68	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.58	5.68	-
Follow-up Hdwy	2.398	-	-	-	-	-	3.662	4.162	3.462
Pot Cap-1 Maneuver	696	-	0	0	-	-	234	168	763
Stage 1	-	-	0	0	-	-	682	608	-
Stage 2	-	-	0	0	-	-	461	347	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	696	-	-	-	-	-	216	0	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	0	-
Stage 1	-	-	-	-	-	-	629	0	-
Stage 2	-	-	-	-	-	-	461	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	70.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	351	696	-	-	-
HCM Lane V/C Ratio	0.947	0.078	-	-	-
HCM Control Delay (s)	70.4	10.6	-	-	-
HCM Lane LOS	F	B	-	-	-
HCM 95th %tile Q(veh)	10.1	0.3	-	-	-

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	15	76	95	37	29	88	98	29	21	179	12
Future Vol, veh/h	7	15	76	95	37	29	88	98	29	21	179	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	8	17	87	109	43	33	101	113	33	24	206	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	10.5	11.1	10.8
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	41%	7%	59%	10%
Vol Thru, %	46%	15%	23%	84%
Vol Right, %	13%	78%	18%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	215	98	161	212
LT Vol	88	7	95	21
Through Vol	98	15	37	179
RT Vol	29	76	29	12
Lane Flow Rate	247	113	185	244
Geometry Grp	1	1	1	1
Degree of Util (X)	0.356	0.163	0.278	0.346
Departure Headway (Hd)	5.181	5.221	5.411	5.108
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	694	687	664	704
Service Time	3.207	3.255	3.44	3.134
HCM Lane V/C Ratio	0.356	0.164	0.279	0.347
HCM Control Delay	11.1	9.3	10.5	10.8
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.6	0.6	1.1	1.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	238	80	40	420	4	219	130	73	7	146	197
Future Volume (veh/h)	81	238	80	40	420	4	219	130	73	7	146	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	84	248	76	42	438	4	228	135	62	7	152	174
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	104	409	125	55	532	5	316	215	99	434	191	219
Arrive On Green	0.07	0.34	0.34	0.03	0.31	0.31	0.19	0.19	0.19	0.25	0.25	0.25
Sat Flow, veh/h	1541	1189	364	1654	1718	16	1697	1155	531	1753	773	885
Grp Volume(v), veh/h	84	0	324	42	0	442	228	0	197	7	0	326
Grp Sat Flow(s),veh/h/ln	1541	0	1553	1654	0	1734	1697	0	1686	1753	0	1658
Q Serve(g_s), s	3.4	0.0	11.0	1.6	0.0	15.0	8.0	0.0	6.8	0.2	0.0	11.7
Cycle Q Clear(g_c), s	3.4	0.0	11.0	1.6	0.0	15.0	8.0	0.0	6.8	0.2	0.0	11.7
Prop In Lane	1.00		0.23	1.00		0.01	1.00		0.31	1.00		0.53
Lane Grp Cap(c), veh/h	104	0	534	55	0	537	316	0	314	434	0	410
V/C Ratio(X)	0.81	0.00	0.61	0.77	0.00	0.82	0.72	0.00	0.63	0.02	0.00	0.79
Avail Cap(c_a), veh/h	414	0	1030	444	0	1150	1125	0	1118	1163	0	1100
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	17.2	30.4	0.0	20.3	24.2	0.0	23.7	18.0	0.0	22.3
Incr Delay (d2), s/veh	13.7	0.0	1.1	19.9	0.0	3.2	3.1	0.0	2.1	0.0	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.5	0.9	0.0	5.7	3.2	0.0	2.6	0.1	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	0.0	18.3	50.3	0.0	23.5	27.3	0.0	25.8	18.0	0.0	25.9
LnGrp LOS	D	A	B	D	A	C	C	A	C	B	A	C
Approach Vol, veh/h		408			484			425			333	
Approach Delay, s/veh		23.4			25.8			26.6			25.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	22.6		14.8	5.1	24.8		18.7				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	17.0	42.0		42.0	17.0	42.0		42.0				
Max Q Clear Time (g_c+I1), s	5.4	17.0		10.0	3.6	13.0		13.7				
Green Ext Time (p_c), s	0.1	2.7		1.8	0.0	2.0		2.0				

Intersection Summary		
HCM 6th Ctrl Delay	25.4	
HCM 6th LOS	C	

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	20	57	58	54	107
Future Vol, veh/h	35	20	57	58	54	107
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	42	24	69	70	65	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	215	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	108	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1423	-	-	-	775	950
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	747	947
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	869
HCM Lane V/C Ratio	0.03	-	-	-	0.223
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	270	435	60	38	29
Future Vol, veh/h	48	270	435	60	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	50	281	453	63	40	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	453	0	-	0	834	453
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1010	-	-	0	341	611
Stage 1	-	-	-	0	645	-
Stage 2	-	-	-	0	695	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1010	-	-	-	324	611
Mov Cap-2 Maneuver	-	-	-	-	324	-
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	695	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1010	-	-	571
HCM Lane V/C Ratio	0.05	-	-	0.122
HCM Control Delay (s)	8.8	-	-	12.2
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	0.4

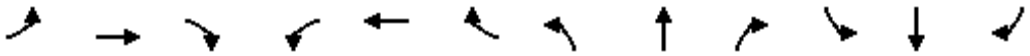
Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	9	356	1	7	165
Future Vol, veh/h	8	9	356	1	7	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	10	11	424	1	8	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	636	424	0	-	424	0
Stage 1	424	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	426	609	-	0	1119	-
Stage 1	639	-	-	0	-	-
Stage 2	800	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	423	609	-	-	1119	-
Mov Cap-2 Maneuver	423	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	505	1119	-
HCM Lane V/C Ratio	-	0.04	0.007	-
HCM Control Delay (s)	-	12.4	8.2	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.1	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	469	15	41	172	73	8	56	33	126	62	14
Future Volume (veh/h)	52	469	15	41	172	73	8	56	33	126	62	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	56	504	15	44	185	69	9	60	35	135	67	6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	84	688	20	68	472	176	14	93	54	229	218	19
Arrive On Green	0.05	0.39	0.39	0.04	0.38	0.38	0.09	0.09	0.09	0.13	0.13	0.13
Sat Flow, veh/h	1739	1764	52	1697	1237	461	153	1021	596	1753	1665	149
Grp Volume(v), veh/h	56	0	519	44	0	254	104	0	0	135	0	73
Grp Sat Flow(s),veh/h/ln	1739	0	1816	1697	0	1698	1770	0	0	1753	0	1814
Q Serve(g_s), s	1.1	0.0	8.4	0.9	0.0	3.7	2.0	0.0	0.0	2.5	0.0	1.3
Cycle Q Clear(g_c), s	1.1	0.0	8.4	0.9	0.0	3.7	2.0	0.0	0.0	2.5	0.0	1.3
Prop In Lane	1.00		0.03	1.00		0.27	0.09		0.34	1.00		0.08
Lane Grp Cap(c), veh/h	84	0	708	68	0	648	162	0	0	229	0	237
V/C Ratio(X)	0.67	0.00	0.73	0.65	0.00	0.39	0.64	0.00	0.00	0.59	0.00	0.31
Avail Cap(c_a), veh/h	858	0	1687	837	0	1577	1644	0	0	1628	0	1684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.1	0.0	9.0	16.3	0.0	7.8	15.1	0.0	0.0	14.1	0.0	13.6
Incr Delay (d2), s/veh	8.8	0.0	1.5	10.0	0.0	0.4	4.2	0.0	0.0	2.4	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.1	0.5	0.0	0.8	0.8	0.0	0.0	0.9	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	10.5	26.3	0.0	8.1	19.3	0.0	0.0	16.5	0.0	14.3
LnGrp LOS	C	A	B	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		575			298			104			208	
Approach Delay, s/veh		11.9			10.8			19.3			15.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	4.7	16.1		6.2	4.4	16.4				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		32.0	17.0	32.0		32.0	17.0	32.0				
Max Q Clear Time (g_c+I1), s		4.5	3.1	5.7		4.0	2.9	10.4				
Green Ext Time (p_c), s		0.7	0.1	1.4		0.5	0.1	3.1				

Intersection Summary												
HCM 6th Ctrl Delay			12.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	684	17	43	284	10	11	0	29	9	0	2
Future Vol, veh/h	1	684	17	43	284	10	11	0	29	9	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	1	743	18	47	309	11	12	0	32	10	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	309	0	0	743	0	0	1157	1157	752	1154	1154	315
Stage 1	-	-	-	-	-	-	754	754	-	409	409	-
Stage 2	-	-	-	-	-	-	403	403	-	745	745	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1240	-	-	829	-	-	171	194	405	169	191	709
Stage 1	-	-	-	-	-	-	397	413	-	606	584	-
Stage 2	-	-	-	-	-	-	618	595	-	395	411	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1240	-	-	829	-	-	161	180	405	148	178	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	180	-	148	178	-
Stage 1	-	-	-	-	-	-	397	413	-	605	544	-
Stage 2	-	-	-	-	-	-	574	554	-	364	411	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	12	26.3
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	559	1240	-	-	829	-	-	181
HCM Lane V/C Ratio	0.078	0.001	-	-	0.056	-	-	0.066
HCM Control Delay (s)	12	7.9	0	-	9.6	0	-	26.3
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2

Intersection	
Int Delay, s/veh	45.9

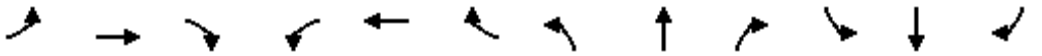
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	297	425	194	256	0	0	0	0	159	2	81
Future Vol, veh/h	0	297	425	194	256	0	0	0	0	159	2	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	9	9	9	2	2	2	9	9	9
Mvmt Flow	0	323	462	211	278	0	0	0	0	173	2	88

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	785	0	0	1254	1485	278
Stage 1	-	-	-	-	-	-	700	700	-
Stage 2	-	-	-	-	-	-	554	785	-
Critical Hdwy	-	-	-	4.19	-	-	6.49	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	5.49	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.49	5.59	-
Follow-up Hdwy	-	-	-	2.281	-	-	3.581	4.081	3.381
Pot Cap-1 Maneuver	0	-	-	803	-	0	183	120	744
Stage 1	0	-	-	-	-	0	480	431	-
Stage 2	0	-	-	-	-	0	562	394	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	803	-	-	~ 135	0	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 135	0	-
Stage 1	-	-	-	-	-	-	354	0	-
Stage 2	-	-	-	-	-	-	562	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.8	259.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	803	-	187
HCM Lane V/C Ratio	-	-	0.263	-	1.407
HCM Control Delay (s)	-	-	11.1	-	259.1
HCM Lane LOS	-	-	B	-	F
HCM 95th %tile Q(veh)	-	-	1.1	-	15.8

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	297	425	194	256	0	0	0	0	159	2	81
Future Volume (veh/h)	0	297	425	194	256	0	0	0	0	159	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	323	422	211	278	0				173	2	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	409	534	238	1334	0				192	2	81
Arrive On Green	0.00	0.58	0.58	0.14	0.76	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	709	927	1682	1767	0				1133	13	478
Grp Volume(v), veh/h	0	0	745	211	278	0				248	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1636	1682	1767	0				1624	0	0
Q Serve(g_s), s	0.0	0.0	42.5	14.8	5.5	0.0				18.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	42.5	14.8	5.5	0.0				18.0	0.0	0.0
Prop In Lane	0.00		0.57	1.00		0.00				0.70		0.29
Lane Grp Cap(c), veh/h	0	0	943	238	1334	0				275	0	0
V/C Ratio(X)	0.00	0.00	0.79	0.89	0.21	0.00				0.90	0.00	0.00
Avail Cap(c_a), veh/h	0	0	943	287	1334	0				315	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.84	0.84	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	19.8	50.6	4.3	0.0				48.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	6.7	20.7	0.3	0.0				25.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	16.5	7.5	1.7	0.0				9.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	26.5	71.3	4.6	0.0				74.0	0.0	0.0
LnGrp LOS	A	A	C	E	A	A				E	A	A
Approach Vol, veh/h		745			489						248	
Approach Delay, s/veh		26.5			33.4						74.0	
Approach LOS		C			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		95.1		24.9	21.5	73.7						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		87.7		23.3	20.5	62.7						
Max Q Clear Time (g_c+I1), s		7.5		20.0	16.8	44.5						
Green Ext Time (p_c), s		1.7		0.4	0.2	5.2						

Intersection Summary												
HCM 6th Ctrl Delay			36.7									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	15.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	407	0	0	331	142	119	0	247	0	0	0
Future Vol, veh/h	49	407	0	0	331	142	119	0	247	0	0	0
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	225	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	9	9	9	8	8	8	2	2	2
Mvmt Flow	52	428	0	0	348	149	125	0	260	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	499	0	-	-	-	0	955	1031	428
Stage 1	-	-	-	-	-	-	532	532	-
Stage 2	-	-	-	-	-	-	423	499	-
Critical Hdwy	4.17	-	-	-	-	-	6.48	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	5.48	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.48	5.58	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.572	4.072	3.372
Pot Cap-1 Maneuver	1040	-	0	0	-	-	280	228	614
Stage 1	-	-	0	0	-	-	577	516	-
Stage 2	-	-	0	0	-	-	648	534	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1040	-	-	-	-	-	266	0	614
Mov Cap-2 Maneuver	-	-	-	-	-	-	266	0	-
Stage 1	-	-	-	-	-	-	548	0	-
Stage 2	-	-	-	-	-	-	648	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	52.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	431	1040	-	-	-
HCM Lane V/C Ratio	0.894	0.05	-	-	-
HCM Control Delay (s)	52.2	8.6	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	9.5	0.2	-	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	20	73	59	13	12	38	110	19	6	92	4
Future Vol, veh/h	2	20	73	59	13	12	38	110	19	6	92	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	2	21	77	62	14	13	40	116	20	6	97	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	8.5	8.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	2%	70%	6%
Vol Thru, %	66%	21%	15%	90%
Vol Right, %	11%	77%	14%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	167	95	84	102
LT Vol	38	2	59	6
Through Vol	110	20	13	92
RT Vol	19	73	12	4
Lane Flow Rate	176	100	88	107
Geometry Grp	1	1	1	1
Degree of Util (X)	0.219	0.12	0.118	0.136
Departure Headway (Hd)	4.488	4.31	4.792	4.558
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	831	748	786
Service Time	2.514	2.338	2.821	2.587
HCM Lane V/C Ratio	0.22	0.12	0.118	0.136
HCM Control Delay	8.8	7.9	8.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.4	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	417	157	68	233	5	121	82	70	11	94	119
Future Volume (veh/h)	80	417	157	68	233	5	121	82	70	11	94	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	83	434	158	71	243	4	126	85	50	11	98	92
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	106	526	191	90	721	12	241	149	87	290	144	135
Arrive On Green	0.06	0.42	0.42	0.05	0.41	0.41	0.14	0.14	0.14	0.17	0.17	0.17
Sat Flow, veh/h	1711	1256	457	1711	1762	29	1725	1064	626	1753	869	816
Grp Volume(v), veh/h	83	0	592	71	0	247	126	0	135	11	0	190
Grp Sat Flow(s),veh/h/ln	1711	0	1713	1711	0	1791	1725	0	1690	1753	0	1685
Q Serve(g_s), s	2.6	0.0	16.4	2.2	0.0	5.1	3.6	0.0	4.0	0.3	0.0	5.7
Cycle Q Clear(g_c), s	2.6	0.0	16.4	2.2	0.0	5.1	3.6	0.0	4.0	0.3	0.0	5.7
Prop In Lane	1.00		0.27	1.00		0.02	1.00		0.37	1.00		0.48
Lane Grp Cap(c), veh/h	106	0	717	90	0	733	241	0	236	290	0	279
V/C Ratio(X)	0.78	0.00	0.83	0.79	0.00	0.34	0.52	0.00	0.57	0.04	0.00	0.68
Avail Cap(c_a), veh/h	543	0	1343	543	0	1404	1352	0	1325	1374	0	1321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.8	0.0	13.8	25.1	0.0	10.9	21.4	0.0	21.6	18.8	0.0	21.0
Incr Delay (d2), s/veh	11.7	0.0	2.5	14.4	0.0	0.3	1.8	0.0	2.2	0.1	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	5.3	1.2	0.0	1.6	1.4	0.0	1.5	0.1	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	0.0	16.3	39.5	0.0	11.1	23.2	0.0	23.7	18.8	0.0	24.0
LnGrp LOS	D	A	B	D	A	B	C	A	C	B	A	C
Approach Vol, veh/h		675			318			261			201	
Approach Delay, s/veh		18.8			17.5			23.5			23.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	11.9	6.3	24.9	10.5	5.8	25.4
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	42.0	17.0	42.0	42.0	17.0	42.0
Max Q Clear Time (g_c+I1), s	7.7	4.6	7.1	6.0	4.2	18.4
Green Ext Time (p_c), s	1.1	0.1	1.4	1.1	0.1	3.9

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	17	32	73	42	50
Future Vol, veh/h	28	17	32	73	42	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	33	20	37	85	49	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	166	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1478	-	-	-	827	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	808	983
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	895
HCM Lane V/C Ratio	0.022	-	-	-	0.12
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	445	268	49	36	38
Future Vol, veh/h	53	445	268	49	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	56	473	285	52	38	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	285	0	-	0	870	285
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	585	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1244	-	-	0	323	756
Stage 1	-	-	-	0	766	-
Stage 2	-	-	-	0	559	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1244	-	-	-	308	756
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1244	-	-	633
HCM Lane V/C Ratio	0.045	-	-	0.124
HCM Control Delay (s)	8	-	-	11.5
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.4

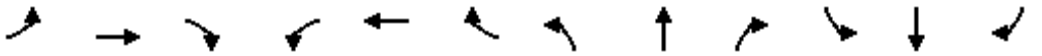
Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	175	5	6	274
Future Vol, veh/h	1	1	175	5	6	274
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	1	1	208	6	7	326

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	548	208	0	-	208	0
Stage 1	208	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	501	837	-	0	1363	-
Stage 1	832	-	-	0	-	-
Stage 2	725	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	498	837	-	-	1363	-
Mov Cap-2 Maneuver	498	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.2
HCM LOS	B		

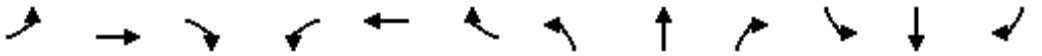
Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	624	1363	-
HCM Lane V/C Ratio	-	0.004	0.005	-
HCM Control Delay (s)	-	10.8	7.7	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	188	193	241	428	0	0	0	0	92	0	52
Future Volume (veh/h)	0	188	193	241	428	0	0	0	0	92	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	204	186	262	465	0				100	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	478	436	286	1441	0				121	0	10
Arrive On Green	0.00	0.62	0.62	0.35	1.00	0.00				0.09	0.00	0.09
Sat Flow, veh/h	0	765	698	1640	1722	0				1375	0	110
Grp Volume(v), veh/h	0	0	390	262	465	0				108	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1463	1640	1722	0				1485	0	0
Q Serve(g_s), s	0.0	0.0	16.4	18.3	0.0	0.0				8.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	16.4	18.3	0.0	0.0				8.6	0.0	0.0
Prop In Lane	0.00		0.48	1.00		0.00				0.93		0.07
Lane Grp Cap(c), veh/h	0	0	914	286	1441	0				131	0	0
V/C Ratio(X)	0.00	0.00	0.43	0.92	0.32	0.00				0.82	0.00	0.00
Avail Cap(c_a), veh/h	0	0	914	458	1441	0				254	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.46	0.46	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	11.5	38.2	0.0	0.0				53.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.5	8.4	0.3	0.0				12.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.3	6.5	0.1	0.0				3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.0	46.6	0.3	0.0				65.9	0.0	0.0
LnGrp LOS	A	A	B	D	A	A				E	A	A
Approach Vol, veh/h		390			727						108	
Approach Delay, s/veh		13.0			17.0						65.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		104.9		15.1	25.4	79.5						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		90.5		20.5	33.5	52.5						
Max Q Clear Time (g_c+I1), s		2.0		10.6	20.3	18.4						
Green Ext Time (p_c), s		3.1		0.3	0.6	2.6						

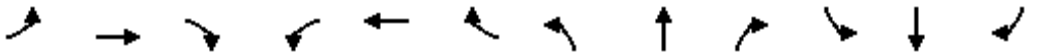
Intersection Summary												
HCM 6th Ctrl Delay			20.0									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	228	0	0	521	315	148	0	171	0	0	0
Future Volume (veh/h)	52	228	0	0	521	315	148	0	171	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	54	238	0	0	543	311	154	0	135			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	65	1119	0	0	664	380	168	0	147			
Arrive On Green	0.09	1.00	0.00	0.00	0.63	0.63	0.21	0.00	0.21			
Sat Flow, veh/h	1499	1574	0	0	1054	604	784	0	687			
Grp Volume(v), veh/h	54	238	0	0	0	854	289	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1658	1470	0	0			
Q Serve(g_s), s	4.3	0.0	0.0	0.0	0.0	47.2	23.1	0.0	0.0			
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.0	0.0	47.2	23.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.36	0.53		0.47			
Lane Grp Cap(c), veh/h	65	1119	0	0	0	1044	315	0	0			
V/C Ratio(X)	0.83	0.21	0.00	0.00	0.00	0.82	0.92	0.00	0.00			
Avail Cap(c_a), veh/h	81	1119	0	0	0	1044	361	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.00	0.61	1.00	0.00	0.00			
Uniform Delay (d), s/veh	54.3	0.0	0.0	0.0	0.0	17.0	46.1	0.0	0.0			
Incr Delay (d2), s/veh	37.1	0.4	0.0	0.0	0.0	4.5	25.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.2	0.1	0.0	0.0	0.0	17.2	10.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.4	0.4	0.0	0.0	0.0	21.4	71.8	0.0	0.0			
LnGrp LOS	F	A	A	A	A	C	E	A	A			
Approach Vol, veh/h		292			854			289				
Approach Delay, s/veh		17.2			21.4			71.8				
Approach LOS		B			C			E				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	9.7	80.1		30.2		89.8			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	6.5	70.5		29.5		81.5			
Max Q Clear Time (g_c+I1), s	6.3	49.2		25.1		2.0			
Green Ext Time (p_c), s	0.0	6.5		0.6		1.4			

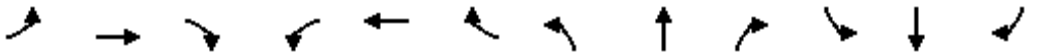
Intersection Summary			
HCM 6th Ctrl Delay		30.7	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	297	425	194	256	0	0	0	0	159	2	81
Future Volume (veh/h)	0	297	425	194	256	0	0	0	0	159	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	323	398	211	278	0				173	2	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	381	470	242	1270	0				197	2	75
Arrive On Green	0.00	0.52	0.52	0.29	1.00	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	735	905	1682	1767	0				1169	14	446
Grp Volume(v), veh/h	0	0	721	211	278	0				241	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1640	1682	1767	0				1628	0	0
Q Serve(g_s), s	0.0	0.0	30.2	9.5	0.0	0.0				11.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	30.2	9.5	0.0	0.0				11.6	0.0	0.0
Prop In Lane	0.00		0.55	1.00		0.00				0.72		0.27
Lane Grp Cap(c), veh/h	0	0	851	242	1270	0				275	0	0
V/C Ratio(X)	0.00	0.00	0.85	0.87	0.22	0.00				0.88	0.00	0.00
Avail Cap(c_a), veh/h	0	0	851	263	1270	0				275	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.83	0.83	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	16.5	27.8	0.0	0.0				32.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	10.2	21.3	0.3	0.0				25.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	11.9	4.5	0.1	0.0				6.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	26.7	49.1	0.3	0.0				58.3	0.0	0.0
LnGrp LOS	A	A	C	D	A	A				E	A	A
Approach Vol, veh/h		721			489						241	
Approach Delay, s/veh		26.7			21.4						58.3	
Approach LOS		C			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		62.0		18.0	16.0	46.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		57.5		13.5	12.5	40.5						
Max Q Clear Time (g_c+I1), s		2.0		13.6	11.5	32.2						
Green Ext Time (p_c), s		1.7		0.0	0.1	3.2						

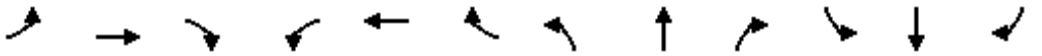
Intersection Summary												
HCM 6th Ctrl Delay			30.2									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	412	0	0	345	151	119	0	250	0	0	0
Future Volume (veh/h)	49	412	0	0	345	151	119	0	250	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	52	434	0	0	363	143	125	0	158			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	73	1219	0	0	698	275	147	0	185			
Arrive On Green	0.09	1.00	0.00	0.00	0.58	0.58	0.21	0.00	0.21			
Sat Flow, veh/h	1711	1796	0	0	1205	475	701	0	886			
Grp Volume(v), veh/h	52	434	0	0	0	506	283	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1680	1587	0	0			
Q Serve(g_s), s	2.4	0.0	0.0	0.0	0.0	14.5	13.7	0.0	0.0			
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.0	0.0	14.5	13.7	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.28	0.44		0.56			
Lane Grp Cap(c), veh/h	73	1219	0	0	0	973	332	0	0			
V/C Ratio(X)	0.71	0.36	0.00	0.00	0.00	0.52	0.85	0.00	0.00			
Avail Cap(c_a), veh/h	118	1219	0	0	0	973	486	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.38	0.38	0.00	0.00	0.00	0.92	1.00	0.00	0.00			
Uniform Delay (d), s/veh	36.1	0.0	0.0	0.0	0.0	10.1	30.4	0.0	0.0			
Incr Delay (d2), s/veh	4.8	0.3	0.0	0.0	0.0	1.8	9.5	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	0.1	0.0	0.0	0.0	4.8	5.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	0.3	0.0	0.0	0.0	12.0	39.9	0.0	0.0			
LnGrp LOS	D	A	A	A	A	B	D	A	A			
Approach Vol, veh/h		486			506			283				
Approach Delay, s/veh		4.6			12.0			39.9				
Approach LOS		A			B			D				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.9	50.8		21.2		58.8						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	5.5	36.5		24.5		46.5						
Max Q Clear Time (g_c+I1), s	4.4	16.5		15.7		2.0						
Green Ext Time (p_c), s	0.0	3.1		1.0		2.8						

Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	224	5	38	340	56	10	57	28	93	28	55
Future Volume (veh/h)	42	224	5	38	340	56	10	57	28	93	28	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	243	4	41	370	54	11	62	30	101	30	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	66	583	10	64	538	79	0	100	48	165	292	194
Arrive On Green	0.04	0.37	0.37	0.04	0.36	0.36	0.00	0.09	0.09	0.10	0.29	0.29
Sat Flow, veh/h	1541	1588	26	1654	1482	216	0	1115	540	1725	1014	676
Grp Volume(v), veh/h	46	0	247	41	0	424	0	0	92	101	0	50
Grp Sat Flow(s),veh/h/ln	1541	0	1614	1654	0	1698	0	0	1655	1725	0	1689
Q Serve(g_s), s	0.9	0.0	3.4	0.7	0.0	6.2	0.0	0.0	1.6	1.7	0.0	0.6
Cycle Q Clear(g_c), s	0.9	0.0	3.4	0.7	0.0	6.2	0.0	0.0	1.6	1.7	0.0	0.6
Prop In Lane	1.00		0.02	1.00		0.13	0.00		0.33	1.00		0.40
Lane Grp Cap(c), veh/h	66	0	592	64	0	617	0	0	149	165	0	486
V/C Ratio(X)	0.70	0.00	0.42	0.64	0.00	0.69	0.00	0.00	0.62	0.61	0.00	0.10
Avail Cap(c_a), veh/h	840	0	4012	620	0	3933	0	0	338	1351	0	1381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	6.9	13.9	0.0	7.9	0.0	0.0	12.9	12.8	0.0	7.7
Incr Delay (d2), s/veh	12.6	0.0	0.5	10.2	0.0	1.4	0.0	0.0	4.1	3.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.6	0.4	0.0	1.3	0.0	0.0	0.6	0.6	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	0.0	7.4	24.1	0.0	9.3	0.0	0.0	17.0	16.4	0.0	7.8
LnGrp LOS	C	A	A	C	A	A	A	A	B	B	A	A
Approach Vol, veh/h		293			465			92			151	
Approach Delay, s/veh		10.4			10.6			17.0			13.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	11.4	4.3	13.7	5.8	5.6	4.1	13.8
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	5.0	24.0	16.0	68.0	23.0	6.0	11.0	73.0
Max Q Clear Time (g_c+I1), s	0.0	2.6	2.9	8.2	3.7	3.6	2.7	5.4
Green Ext Time (p_c), s	0.0	0.2	0.1	2.8	0.2	0.1	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

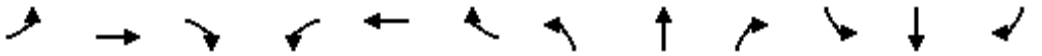
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	363	6	20	460	2	26	0	20	2	1	0
Future Vol, veh/h	0	363	6	20	460	2	26	0	20	2	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	417	7	23	529	2	30	0	23	2	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	529	0	0	417	0	0	997	996	421	993	993	530
Stage 1	-	-	-	-	-	-	421	421	-	576	576	-
Stage 2	-	-	-	-	-	-	576	575	-	417	417	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	948	-	-	1090	-	-	223	244	632	172	191	441
Stage 1	-	-	-	-	-	-	610	589	-	405	412	-
Stage 2	-	-	-	-	-	-	503	503	-	503	494	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	948	-	-	1090	-	-	217	237	632	162	185	441
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	237	-	162	185	-
Stage 1	-	-	-	-	-	-	610	589	-	405	400	-
Stage 2	-	-	-	-	-	-	487	488	-	485	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	15.9	26.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	384	948	-	-	1090	-	-	169
HCM Lane V/C Ratio	0.138	-	-	-	0.021	-	-	0.02
HCM Control Delay (s)	15.9	0	-	-	8.4	0	-	26.7
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	192	193	244	430	0	0	0	0	100	0	52
Future Volume (veh/h)	0	192	193	244	430	0	0	0	0	100	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	209	186	265	467	0				109	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	476	423	289	1425	0				134	0	11
Arrive On Green	0.00	0.61	0.61	0.35	1.00	0.00				0.10	0.00	0.10
Sat Flow, veh/h	0	775	690	1640	1722	0				1372	0	113
Grp Volume(v), veh/h	0	0	395	265	467	0				118	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1465	1640	1722	0				1485	0	0
Q Serve(g_s), s	0.0	0.0	17.1	18.6	0.0	0.0				9.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	17.1	18.6	0.0	0.0				9.3	0.0	0.0
Prop In Lane	0.00		0.47	1.00		0.00				0.92		0.08
Lane Grp Cap(c), veh/h	0	0	899	289	1425	0				145	0	0
V/C Ratio(X)	0.00	0.00	0.44	0.92	0.33	0.00				0.82	0.00	0.00
Avail Cap(c_a), veh/h	0	0	899	444	1425	0				266	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.44	0.44	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	12.2	38.0	0.0	0.0				53.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.6	9.0	0.3	0.0				10.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.5	6.6	0.1	0.0				3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.8	47.0	0.3	0.0				63.6	0.0	0.0
LnGrp LOS	A	A	B	D	A	A				E	A	A
Approach Vol, veh/h		395			732						118	
Approach Delay, s/veh		13.8			17.2						63.6	
Approach LOS		B			B						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		103.8		16.2	25.6	78.2						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		89.5		21.5	32.5	52.5						
Max Q Clear Time (g_c+I1), s		2.0		11.3	20.6	19.1						
Green Ext Time (p_c), s		3.1		0.3	0.6	2.6						

Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	240	0	0	526	318	148	0	178	0	0	0
Future Volume (veh/h)	52	240	0	0	526	318	148	0	178	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	54	250	0	0	548	314	154	0	142			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	66	1112	0	0	659	377	167	0	154			
Arrive On Green	0.03	0.47	0.00	0.00	0.62	0.62	0.22	0.00	0.22			
Sat Flow, veh/h	1499	1574	0	0	1054	604	764	0	704			
Grp Volume(v), veh/h	54	250	0	0	0	862	296	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1658	1468	0	0			
Q Serve(g_s), s	4.3	11.2	0.0	0.0	0.0	48.8	23.7	0.0	0.0			
Cycle Q Clear(g_c), s	4.3	11.2	0.0	0.0	0.0	48.8	23.7	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.36	0.52		0.48			
Lane Grp Cap(c), veh/h	66	1112	0	0	0	1036	321	0	0			
V/C Ratio(X)	0.82	0.22	0.00	0.00	0.00	0.83	0.92	0.00	0.00			
Avail Cap(c_a), veh/h	81	1112	0	0	0	1036	361	0	0			
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	0.00	0.58	1.00	0.00	0.00			
Uniform Delay (d), s/veh	57.8	12.2	0.0	0.0	0.0	17.6	45.9	0.0	0.0			
Incr Delay (d2), s/veh	35.7	0.4	0.0	0.0	0.0	4.7	26.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.3	4.2	0.0	0.0	0.0	17.9	10.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.5	12.7	0.0	0.0	0.0	22.3	72.7	0.0	0.0			
LnGrp LOS	F	B	A	A	A	C	E	A	A			
Approach Vol, veh/h		304			862			296				
Approach Delay, s/veh		27.0			22.3			72.7				
Approach LOS		C			C			E				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	9.8	79.5		30.8		89.2			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	6.5	70.5		29.5		81.5			
Max Q Clear Time (g_c+I1), s	6.3	50.8		25.7		13.2			
Green Ext Time (p_c), s	0.0	6.4		0.6		1.5			

Intersection Summary		
HCM 6th Ctrl Delay		33.5
HCM 6th LOS		C

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	15	76	95	37	29	88	99	29	21	180	12
Future Vol, veh/h	7	15	76	95	37	29	88	99	29	21	180	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	8	17	87	109	43	33	101	114	33	24	207	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	10.5	11.1	10.9
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	41%	7%	59%	10%
Vol Thru, %	46%	15%	23%	85%
Vol Right, %	13%	78%	18%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	216	98	161	213
LT Vol	88	7	95	21
Through Vol	99	15	37	180
RT Vol	29	76	29	12
Lane Flow Rate	248	113	185	245
Geometry Grp	1	1	1	1
Degree of Util (X)	0.358	0.164	0.279	0.348
Departure Headway (Hd)	5.185	5.23	5.418	5.112
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	695	686	664	705
Service Time	3.213	3.264	3.449	3.14
HCM Lane V/C Ratio	0.357	0.165	0.279	0.348
HCM Control Delay	11.1	9.3	10.5	10.9
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.6	0.6	1.1	1.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	238	99	45	420	4	227	131	76	7	147	197
Future Volume (veh/h)	81	238	99	45	420	4	227	131	76	7	147	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	84	248	93	47	438	4	236	136	69	7	153	174
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	103	387	145	60	539	5	294	461	234	16	194	220
Arrive On Green	0.07	0.34	0.34	0.04	0.31	0.31	0.17	0.41	0.41	0.01	0.25	0.25
Sat Flow, veh/h	1541	1122	421	1654	1718	16	1697	1114	565	1753	776	883
Grp Volume(v), veh/h	84	0	341	47	0	442	236	0	205	7	0	327
Grp Sat Flow(s),veh/h/ln	1541	0	1543	1654	0	1734	1697	0	1680	1753	0	1659
Q Serve(g_s), s	3.3	0.0	11.4	1.7	0.0	14.4	8.2	0.0	5.0	0.2	0.0	11.3
Cycle Q Clear(g_c), s	3.3	0.0	11.4	1.7	0.0	14.4	8.2	0.0	5.0	0.2	0.0	11.3
Prop In Lane	1.00		0.27	1.00		0.01	1.00		0.34	1.00		0.53
Lane Grp Cap(c), veh/h	103	0	531	60	0	543	294	0	695	16	0	414
V/C Ratio(X)	0.81	0.00	0.64	0.79	0.00	0.81	0.80	0.00	0.29	0.44	0.00	0.79
Avail Cap(c_a), veh/h	378	0	1438	271	0	1475	888	0	1264	860	0	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	16.9	29.2	0.0	19.3	24.3	0.0	12.0	30.1	0.0	21.4
Incr Delay (d2), s/veh	14.0	0.0	1.3	20.2	0.0	3.0	5.1	0.0	0.2	17.5	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	3.6	1.0	0.0	5.4	3.3	0.0	1.6	0.2	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	18.2	49.4	0.0	22.3	29.3	0.0	12.2	47.6	0.0	24.8
LnGrp LOS	D	A	B	D	A	C	C	A	B	D	A	C
Approach Vol, veh/h		425			489			441			334	
Approach Delay, s/veh		22.9			25.0			21.4			25.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	18.3	7.1	22.2	3.6	28.3	5.2	24.1
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	32.0	44.0	15.0	52.0	30.0	46.0	10.0	57.0
Max Q Clear Time (g_c+I1), s	10.2	13.3	5.3	16.4	2.2	7.0	3.7	13.4
Green Ext Time (p_c), s	0.6	2.1	0.1	2.8	0.0	1.2	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	20	57	58	54	107
Future Vol, veh/h	35	20	57	58	54	107
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	42	24	69	70	65	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	215	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	108	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1423	-	-	-	775	950
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	747	947
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	869
HCM Lane V/C Ratio	0.03	-	-	-	0.223
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	273	440	60	38	29
Future Vol, veh/h	48	273	440	60	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	50	284	458	63	40	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	458	0	-	0	842	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1005	-	-	0	337	607
Stage 1	-	-	-	0	641	-
Stage 2	-	-	-	0	693	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1005	-	-	-	320	607
Mov Cap-2 Maneuver	-	-	-	-	320	-
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	693	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1005	-	-	564
HCM Lane V/C Ratio	0.05	-	-	0.124
HCM Control Delay (s)	8.8	-	-	12.3
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	9	357	1	7	166
Future Vol, veh/h	8	9	357	1	7	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	10	11	425	1	8	198

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	639	425	0	-	425	0
Stage 1	425	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	425	608	-	0	1118	-
Stage 1	639	-	-	0	-	-
Stage 2	798	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	422	608	-	-	1118	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	504	1118	-
HCM Lane V/C Ratio	-	0.04	0.007	-
HCM Control Delay (s)	-	12.4	8.2	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.1	0	-

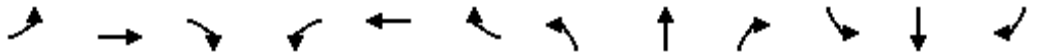
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	422	266	25
Future Vol, veh/h	12	1	1	422	266	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	1	1	459	289	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	764	303	316	0	-	0
Stage 1	303	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	372	737	1244	-	-	-
Stage 1	749	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	372	737	1244	-	-	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	635	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1244	-	387	-	-
HCM Lane V/C Ratio	0.001	-	0.037	-	-
HCM Control Delay (s)	7.9	-	14.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	471	15	42	176	74	8	56	34	126	62	14
Future Volume (veh/h)	52	471	15	42	176	74	8	56	34	126	62	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	56	506	15	45	189	67	9	60	37	135	67	9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	83	700	21	69	489	173	14	92	57	227	206	28
Arrive On Green	0.05	0.40	0.40	0.04	0.39	0.39	0.09	0.09	0.09	0.13	0.13	0.13
Sat Flow, veh/h	1739	1764	52	1697	1256	445	150	1000	617	1753	1589	213
Grp Volume(v), veh/h	56	0	521	45	0	256	106	0	0	135	0	76
Grp Sat Flow(s),veh/h/ln	1739	0	1816	1697	0	1701	1767	0	0	1753	0	1802
Q Serve(g_s), s	1.1	0.0	8.5	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.3
Cycle Q Clear(g_c), s	1.1	0.0	8.5	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.3
Prop In Lane	1.00		0.03	1.00		0.26	0.08		0.35	1.00		0.12
Lane Grp Cap(c), veh/h	83	0	721	69	0	663	162	0	0	227	0	234
V/C Ratio(X)	0.67	0.00	0.72	0.66	0.00	0.39	0.65	0.00	0.00	0.59	0.00	0.33
Avail Cap(c_a), veh/h	544	0	3099	531	0	2903	904	0	0	1196	0	1230
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	9.0	16.6	0.0	7.7	15.4	0.0	0.0	14.4	0.0	13.9
Incr Delay (d2), s/veh	9.0	0.0	1.4	10.1	0.0	0.4	4.4	0.0	0.0	2.5	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	2.2	0.5	0.0	0.9	0.8	0.0	0.0	0.9	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	0.0	10.4	26.8	0.0	8.1	19.9	0.0	0.0	16.9	0.0	14.7
LnGrp LOS	C	A	B	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		577			301			106			211	
Approach Delay, s/veh		11.8			10.9			19.9			16.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.6	4.7	16.7		6.2	4.4	17.0				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		24.0	11.0	60.0		18.0	11.0	60.0				
Max Q Clear Time (g_c+I1), s		4.6	3.1	5.8		4.0	2.9	10.5				
Green Ext Time (p_c), s		0.7	0.0	1.6		0.4	0.0	3.5				

Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									

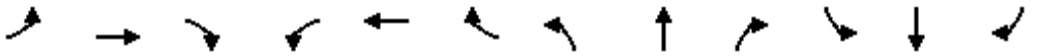
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	686	17	43	290	10	11	0	29	9	0	2
Future Vol, veh/h	1	686	17	43	290	10	11	0	29	9	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	1	746	18	47	315	11	12	0	32	10	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	315	0	0	746	0	0	1166	1166	755	1163	1163	321
Stage 1	-	-	-	-	-	-	757	757	-	415	415	-
Stage 2	-	-	-	-	-	-	409	409	-	748	748	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1234	-	-	827	-	-	169	191	404	166	189	704
Stage 1	-	-	-	-	-	-	395	411	-	601	581	-
Stage 2	-	-	-	-	-	-	613	591	-	394	410	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1234	-	-	827	-	-	159	177	404	145	176	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	177	-	145	176	-
Stage 1	-	-	-	-	-	-	395	411	-	600	540	-
Stage 2	-	-	-	-	-	-	568	550	-	363	410	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	12	26.8
HCM LOS			B	D

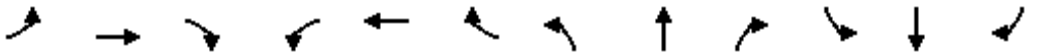
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	557	1234	-	-	827	-	-	177
HCM Lane V/C Ratio	0.078	0.001	-	-	0.057	-	-	0.068
HCM Control Delay (s)	12	7.9	0	-	9.6	0	-	26.8
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	299	425	202	262	0	0	0	0	162	2	81
Future Volume (veh/h)	0	299	425	202	262	0	0	0	0	162	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	325	398	220	285	0				176	2	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	379	464	250	1270	0				198	2	74
Arrive On Green	0.00	0.51	0.51	0.30	1.00	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	738	903	1682	1767	0				1175	13	441
Grp Volume(v), veh/h	0	0	723	220	285	0				244	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1641	1682	1767	0				1629	0	0
Q Serve(g_s), s	0.0	0.0	30.6	10.0	0.0	0.0				11.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	30.6	10.0	0.0	0.0				11.7	0.0	0.0
Prop In Lane	0.00		0.55	1.00		0.00				0.72		0.27
Lane Grp Cap(c), veh/h	0	0	843	250	1270	0				275	0	0
V/C Ratio(X)	0.00	0.00	0.86	0.88	0.22	0.00				0.89	0.00	0.00
Avail Cap(c_a), veh/h	0	0	843	263	1270	0				275	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.83	0.83	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	16.9	27.4	0.0	0.0				32.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	11.0	22.8	0.3	0.0				27.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	12.2	4.8	0.1	0.0				6.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	27.9	50.2	0.3	0.0				60.1	0.0	0.0
LnGrp LOS	A	A	C	D	A	A				E	A	A
Approach Vol, veh/h		723			505						244	
Approach Delay, s/veh		27.9			22.1						60.1	
Approach LOS		C			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		62.0		18.0	16.4	45.6						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		57.5		13.5	12.5	40.5						
Max Q Clear Time (g_c+I1), s		2.0		13.7	12.0	32.6						
Green Ext Time (p_c), s		1.7		0.0	0.0	3.1						

Intersection Summary												
HCM 6th Ctrl Delay			31.2									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	412	0	0	345	151	119	0	250	0	0	0
Future Volume (veh/h)	49	412	0	0	345	151	119	0	250	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	52	434	0	0	363	143	125	0	158			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	73	1219	0	0	698	275	147	0	185			
Arrive On Green	0.09	1.00	0.00	0.00	0.58	0.58	0.21	0.00	0.21			
Sat Flow, veh/h	1711	1796	0	0	1205	475	701	0	886			
Grp Volume(v), veh/h	52	434	0	0	0	506	283	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1680	1587	0	0			
Q Serve(g_s), s	2.4	0.0	0.0	0.0	0.0	14.5	13.7	0.0	0.0			
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.0	0.0	14.5	13.7	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.28	0.44		0.56			
Lane Grp Cap(c), veh/h	73	1219	0	0	0	973	332	0	0			
V/C Ratio(X)	0.71	0.36	0.00	0.00	0.00	0.52	0.85	0.00	0.00			
Avail Cap(c_a), veh/h	118	1219	0	0	0	973	486	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.37	0.37	0.00	0.00	0.00	0.92	1.00	0.00	0.00			
Uniform Delay (d), s/veh	36.1	0.0	0.0	0.0	0.0	10.1	30.4	0.0	0.0			
Incr Delay (d2), s/veh	4.6	0.3	0.0	0.0	0.0	1.8	9.5	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	0.1	0.0	0.0	0.0	4.8	5.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	0.3	0.0	0.0	0.0	12.0	39.9	0.0	0.0			
LnGrp LOS	D	A	A	A	A	B	D	A	A			
Approach Vol, veh/h		486			506			283				
Approach Delay, s/veh		4.6			12.0			39.9				
Approach LOS		A			B			D				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.9	50.8		21.2		58.8						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	5.5	36.5		24.5		46.5						
Max Q Clear Time (g_c+I1), s	4.4	16.5		15.7		2.0						
Green Ext Time (p_c), s	0.0	3.1		1.0		2.8						

Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	20	73	59	13	12	38	112	19	6	93	4
Future Vol, veh/h	2	20	73	59	13	12	38	112	19	6	93	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	2	21	77	62	14	13	40	118	20	6	98	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	8.5	8.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	2%	70%	6%
Vol Thru, %	66%	21%	15%	90%
Vol Right, %	11%	77%	14%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	95	84	103
LT Vol	38	2	59	6
Through Vol	112	20	13	93
RT Vol	19	73	12	4
Lane Flow Rate	178	100	88	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.222	0.12	0.118	0.137
Departure Headway (Hd)	4.489	4.317	4.799	4.561
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	801	830	747	786
Service Time	2.516	2.345	2.829	2.59
HCM Lane V/C Ratio	0.222	0.12	0.118	0.137
HCM Control Delay	8.8	7.9	8.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.4	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	417	165	70	233	5	144	84	77	11	95	119
Future Volume (veh/h)	80	417	165	70	233	5	144	84	77	11	95	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	83	434	163	73	243	4	150	88	58	11	99	95
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	106	527	198	92	731	12	251	148	97	290	142	136
Arrive On Green	0.06	0.42	0.42	0.05	0.42	0.42	0.15	0.15	0.15	0.17	0.17	0.17
Sat Flow, veh/h	1711	1244	467	1711	1762	29	1725	1014	668	1753	859	824
Grp Volume(v), veh/h	83	0	597	73	0	247	150	0	146	11	0	194
Grp Sat Flow(s),veh/h/ln	1711	0	1711	1711	0	1791	1725	0	1683	1753	0	1683
Q Serve(g_s), s	2.7	0.0	17.5	2.4	0.0	5.3	4.6	0.0	4.6	0.3	0.0	6.2
Cycle Q Clear(g_c), s	2.7	0.0	17.5	2.4	0.0	5.3	4.6	0.0	4.6	0.3	0.0	6.2
Prop In Lane	1.00		0.27	1.00		0.02	1.00		0.40	1.00		0.49
Lane Grp Cap(c), veh/h	106	0	725	92	0	743	251	0	245	290	0	278
V/C Ratio(X)	0.78	0.00	0.82	0.79	0.00	0.33	0.60	0.00	0.60	0.04	0.00	0.70
Avail Cap(c_a), veh/h	454	0	2118	333	0	2090	915	0	892	992	0	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	14.4	26.5	0.0	11.2	22.6	0.0	22.6	19.8	0.0	22.3
Incr Delay (d2), s/veh	11.8	0.0	2.4	14.2	0.0	0.3	2.3	0.0	2.3	0.1	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	5.7	1.2	0.0	1.7	1.8	0.0	1.8	0.1	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	16.9	40.7	0.0	11.5	24.9	0.0	24.9	19.9	0.0	25.4
LnGrp LOS	D	A	B	D	A	B	C	A	C	B	A	C
Approach Vol, veh/h		680			320			296			205	
Approach Delay, s/veh		19.4			18.1			24.9			25.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	12.3	6.5	26.5	11.2	6.0	27.0
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	32.0	15.0	66.0	30.0	11.0	70.0
Max Q Clear Time (g_c+I1), s	8.2	4.7	7.3	6.6	4.4	19.5
Green Ext Time (p_c), s	1.1	0.1	1.5	1.2	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	17	32	73	42	50
Future Vol, veh/h	28	17	32	73	42	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	33	20	37	85	49	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	166	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1478	-	-	-	827	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	808	983
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	895
HCM Lane V/C Ratio	0.022	-	-	-	0.12
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	452	270	49	36	38
Future Vol, veh/h	53	452	270	49	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	56	481	287	52	38	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	287	0	-	0	880	287
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	593	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1241	-	-	0	319	754
Stage 1	-	-	-	0	764	-
Stage 2	-	-	-	0	554	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1241	-	-	-	305	754
Mov Cap-2 Maneuver	-	-	-	-	305	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1241	-	-	627
HCM Lane V/C Ratio	0.045	-	-	0.126
HCM Control Delay (s)	8	-	-	11.6
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	176	5	6	276
Future Vol, veh/h	1	1	176	5	6	276
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	1	1	210	6	7	329

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	553	210	0	-	210	0
Stage 1	210	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	498	835	-	0	1361	-
Stage 1	830	-	-	0	-	-
Stage 2	723	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	496	835	-	-	1361	-
Mov Cap-2 Maneuver	496	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	622	1361	-
HCM Lane V/C Ratio	-	0.004	0.005	-
HCM Control Delay (s)	-	10.8	7.7	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0	0	-

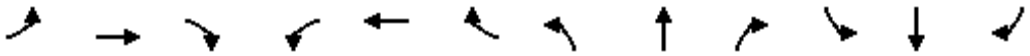
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	2	1	273	319	11
Future Vol, veh/h	31	2	1	273	319	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	1	297	347	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	652	353	359	0	-	0
Stage 1	353	-	-	-	-	-
Stage 2	299	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	433	691	1200	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	433	691	1200	-	-	-
Mov Cap-2 Maneuver	433	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	752	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	443	-	-
HCM Lane V/C Ratio	0.001	-	0.081	-	-
HCM Control Delay (s)	8	-	13.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	231	5	39	348	57	10	57	29	94	28	55
Future Volume (veh/h)	42	231	5	39	348	57	10	57	29	94	28	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	251	4	42	378	57	11	62	32	102	30	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	65	586	9	65	539	81	17	93	48	195	151	45
Arrive On Green	0.04	0.37	0.37	0.04	0.37	0.37	0.10	0.10	0.10	0.11	0.11	0.11
Sat Flow, veh/h	1541	1589	25	1654	1475	222	173	976	504	1725	1338	401
Grp Volume(v), veh/h	46	0	255	42	0	435	105	0	0	102	0	39
Grp Sat Flow(s),veh/h/ln	1541	0	1614	1654	0	1697	1652	0	0	1725	0	1739
Q Serve(g_s), s	0.9	0.0	3.7	0.8	0.0	6.8	1.9	0.0	0.0	1.7	0.0	0.6
Cycle Q Clear(g_c), s	0.9	0.0	3.7	0.8	0.0	6.8	1.9	0.0	0.0	1.7	0.0	0.6
Prop In Lane	1.00		0.02	1.00		0.13	0.10		0.30	1.00		0.23
Lane Grp Cap(c), veh/h	65	0	595	65	0	621	158	0	0	195	0	196
V/C Ratio(X)	0.71	0.00	0.43	0.65	0.00	0.70	0.66	0.00	0.00	0.52	0.00	0.20
Avail Cap(c_a), veh/h	591	0	3147	476	0	3147	1268	0	0	1048	0	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	7.4	14.8	0.0	8.5	13.7	0.0	0.0	13.1	0.0	12.6
Incr Delay (d2), s/veh	13.2	0.0	0.5	10.4	0.0	1.5	4.7	0.0	0.0	2.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.7	0.4	0.0	1.5	0.7	0.0	0.0	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	7.9	25.3	0.0	9.9	18.4	0.0	0.0	15.3	0.0	13.1
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		301			477			105			141	
Approach Delay, s/veh		11.0			11.3			18.4			14.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.5	4.3	14.4		6.0	4.2	14.5				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		19.0	12.0	58.0		24.0	9.0	61.0				
Max Q Clear Time (g_c+I1), s		3.7	2.9	8.8		3.9	2.8	5.7				
Green Ext Time (p_c), s		0.3	0.0	2.9		0.4	0.0	1.5				

Intersection Summary												
HCM 6th Ctrl Delay			12.4									
HCM 6th LOS			B									

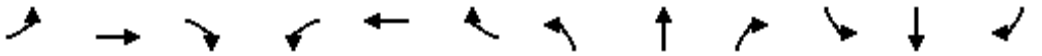
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	372	6	20	471	2	26	0	20	2	1	0
Future Vol, veh/h	0	372	6	20	471	2	26	0	20	2	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	428	7	23	541	2	30	0	23	2	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	541	0	0	428	0	0	1020	1019	432	1016	1016	542
Stage 1	-	-	-	-	-	-	432	432	-	588	588	-
Stage 2	-	-	-	-	-	-	588	587	-	428	428	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	938	-	-	1080	-	-	215	237	624	165	185	434
Stage 1	-	-	-	-	-	-	602	582	-	398	406	-
Stage 2	-	-	-	-	-	-	495	497	-	496	488	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	938	-	-	1080	-	-	209	230	624	155	179	434
Mov Cap-2 Maneuver	-	-	-	-	-	-	209	230	-	155	179	-
Stage 1	-	-	-	-	-	-	602	582	-	398	393	-
Stage 2	-	-	-	-	-	-	478	482	-	478	488	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	16.3	27.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	370	938	-	-	1080	-	-	162
HCM Lane V/C Ratio	0.143	-	-	-	0.021	-	-	0.021
HCM Control Delay (s)	16.3	0	-	-	8.4	0	-	27.7
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	201	193	347	441	0	0	0	0	202	0	52
Future Volume (veh/h)	0	201	193	347	441	0	0	0	0	202	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	218	184	377	479	0				220	0	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	375	317	397	1294	0				245	0	13
Arrive On Green	0.00	0.47	0.47	0.48	1.00	0.00				0.17	0.00	0.17
Sat Flow, veh/h	0	796	672	1640	1722	0				1412	0	77
Grp Volume(v), veh/h	0	0	402	377	479	0				232	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1468	1640	1722	0				1489	0	0
Q Serve(g_s), s	0.0	0.0	23.9	26.3	0.0	0.0				18.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	23.9	26.3	0.0	0.0				18.3	0.0	0.0
Prop In Lane	0.00		0.46	1.00		0.00				0.95		0.05
Lane Grp Cap(c), veh/h	0	0	692	397	1294	0				258	0	0
V/C Ratio(X)	0.00	0.00	0.58	0.95	0.37	0.00				0.90	0.00	0.00
Avail Cap(c_a), veh/h	0	0	692	499	1294	0				317	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	23.1	30.2	0.0	0.0				48.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.5	4.0	0.1	0.0				23.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	8.6	7.8	0.0	0.0				8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	26.6	34.2	0.1	0.0				72.1	0.0	0.0
LnGrp LOS	A	A	C	C	A	A				E	A	A
Approach Vol, veh/h		402			856						232	
Approach Delay, s/veh		26.6			15.1						72.1	
Approach LOS		C			B						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		94.7		25.3	33.6	61.1						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		85.5		25.5	36.5	44.5						
Max Q Clear Time (g_c+I1), s		2.0		20.3	28.3	25.9						
Green Ext Time (p_c), s		3.2		0.5	0.8	2.3						

Intersection Summary												
HCM 6th Ctrl Delay			27.1									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	351	0	0	640	425	148	0	277	0	0	0
Future Volume (veh/h)	52	351	0	0	640	425	148	0	277	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	54	366	0	0	667	424	154	0	233			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	62	1082	0	0	614	390	137	0	207			
Arrive On Green	0.01	0.23	0.00	0.00	0.61	0.61	0.24	0.00	0.24			
Sat Flow, veh/h	1499	1574	0	0	1009	642	576	0	872			
Grp Volume(v), veh/h	54	366	0	0	0	1091	387	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1651	1448	0	0			
Q Serve(g_s), s	4.3	23.4	0.0	0.0	0.0	73.0	28.5	0.0	0.0			
Cycle Q Clear(g_c), s	4.3	23.4	0.0	0.0	0.0	73.0	28.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.39	0.40		0.60			
Lane Grp Cap(c), veh/h	62	1082	0	0	0	1004	344	0	0			
V/C Ratio(X)	0.86	0.34	0.00	0.00	0.00	1.09	1.13	0.00	0.00			
Avail Cap(c_a), veh/h	62	1082	0	0	0	1004	344	0	0			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	0.00	0.09	1.00	0.00	0.00			
Uniform Delay (d), s/veh	58.8	23.5	0.0	0.0	0.0	23.5	45.8	0.0	0.0			
Incr Delay (d2), s/veh	54.9	0.6	0.0	0.0	0.0	40.7	87.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.6	10.0	0.0	0.0	0.0	36.2	18.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	113.7	24.1	0.0	0.0	0.0	64.2	132.8	0.0	0.0			
LnGrp LOS	F	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		420			1091			387				
Approach Delay, s/veh		35.7			64.2			132.8				
Approach LOS		D			E			F				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	9.5	77.5		33.0		87.0			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.0	73.0		28.5		82.5			
Max Q Clear Time (g_c+I1), s	6.3	75.0		30.5		25.4			
Green Ext Time (p_c), s	0.0	0.0		0.0		2.3			

Intersection Summary		
HCM 6th Ctrl Delay		71.9
HCM 6th LOS		E

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	15	77	96	37	29	89	100	30	21	181	12
Future Vol, veh/h	7	15	77	96	37	29	89	100	30	21	181	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	8	17	89	110	43	33	102	115	34	24	208	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	10.6	11.2	10.9
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	41%	7%	59%	10%
Vol Thru, %	46%	15%	23%	85%
Vol Right, %	14%	78%	18%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	99	162	214
LT Vol	89	7	96	21
Through Vol	100	15	37	181
RT Vol	30	77	29	12
Lane Flow Rate	252	114	186	246
Geometry Grp	1	1	1	1
Degree of Util (X)	0.363	0.166	0.281	0.35
Departure Headway (Hd)	5.194	5.244	5.435	5.125
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	692	684	661	703
Service Time	3.222	3.278	3.466	3.153
HCM Lane V/C Ratio	0.364	0.167	0.281	0.35
HCM Control Delay	11.2	9.3	10.6	10.9
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.7	0.6	1.2	1.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	206	80	40	371	69	219	134	73	55	150	475
Future Volume (veh/h)	342	206	80	40	371	69	219	134	73	55	150	475
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	356	215	75	42	386	67	228	140	64	57	156	423
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	310	472	165	53	350	61	263	179	82	559	137	373
Arrive On Green	0.20	0.41	0.41	0.03	0.24	0.24	0.15	0.15	0.15	0.32	0.32	0.32
Sat Flow, veh/h	1541	1146	400	1654	1442	250	1697	1157	529	1753	431	1169
Grp Volume(v), veh/h	356	0	290	42	0	453	228	0	204	57	0	579
Grp Sat Flow(s),veh/h/ln	1541	0	1546	1654	0	1692	1697	0	1686	1753	0	1600
Q Serve(g_s), s	29.0	0.0	19.6	3.6	0.0	35.0	18.9	0.0	16.8	3.3	0.0	46.0
Cycle Q Clear(g_c), s	29.0	0.0	19.6	3.6	0.0	35.0	18.9	0.0	16.8	3.3	0.0	46.0
Prop In Lane	1.00		0.26	1.00		0.15	1.00		0.31	1.00		0.73
Lane Grp Cap(c), veh/h	310	0	636	53	0	410	263	0	261	559	0	510
V/C Ratio(X)	1.15	0.00	0.46	0.80	0.00	1.10	0.87	0.00	0.78	0.10	0.00	1.14
Avail Cap(c_a), veh/h	310	0	636	115	0	410	388	0	385	559	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.7	0.0	30.8	69.4	0.0	54.7	59.6	0.0	58.6	34.6	0.0	49.2
Incr Delay (d2), s/veh	98.1	0.0	0.5	22.9	0.0	75.7	13.0	0.0	6.1	0.1	0.0	82.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	0.0	7.3	1.9	0.0	23.3	9.0	0.0	7.5	1.4	0.0	29.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	155.8	0.0	31.3	92.3	0.0	130.4	72.6	0.0	64.7	34.7	0.0	131.9
LnGrp LOS	F	A	C	F	A	F	E	A	E	C	A	F
Approach Vol, veh/h		646			495			432			636	
Approach Delay, s/veh		99.9			127.2			68.9			123.2	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	49.0	32.0	38.0	25.4	7.6	62.4
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	46.0	29.0	35.0	33.0	10.0	54.0
Max Q Clear Time (g_c+I1), s	48.0	31.0	37.0	20.9	5.6	21.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	106.6
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	20	57	58	54	108
Future Vol, veh/h	36	20	57	58	54	108
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	43	24	69	70	65	130

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	217	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1423	-	-	-	773	950
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	744	947
Mov Cap-2 Maneuver	-	-	-	-	744	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	868
HCM Lane V/C Ratio	0.031	-	-	-	0.225
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	286	451	60	38	29
Future Vol, veh/h	48	286	451	60	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	50	298	470	63	40	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	470	0	-	0	868	470
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	398	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	995	-	-	0	325	598
Stage 1	-	-	-	0	633	-
Stage 2	-	-	-	0	683	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	995	-	-	-	309	598
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	683	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	995	-	-	545
HCM Lane V/C Ratio	0.05	-	-	0.128
HCM Control Delay (s)	8.8	-	-	12.6
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	359	1	8	168
Future Vol, veh/h	8	10	359	1	8	168
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	10	12	427	1	10	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	647	427	0	-	427	0
Stage 1	427	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	420	607	-	0	1116	-
Stage 1	637	-	-	0	-	-
Stage 2	793	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	416	607	-	-	1116	-
Mov Cap-2 Maneuver	416	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	504	1116	-
HCM Lane V/C Ratio	-	0.043	0.009	-
HCM Control Delay (s)	-	12.5	8.3	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	2	217	34	2	352
Future Vol, veh/h	34	2	217	34	2	352
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	2	236	37	2	383

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	642	255	0	0	273	0
Stage 1	255	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	438	784	-	-	1290	-
Stage 1	788	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	437	784	-	-	1290	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	686	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	448	1290	-
HCM Lane V/C Ratio	-	-	0.087	0.002	-
HCM Control Delay (s)	-	-	13.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	37.2

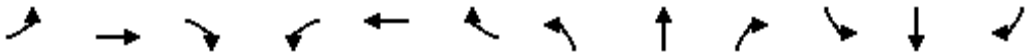
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	320	26	225	320	26	360
Future Vol, veh/h	320	26	225	320	26	360
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	348	28	245	348	28	391

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	866	419	0	0	593	0
Stage 1	419	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 324	634	-	-	983	-
Stage 1	664	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 312	634	-	-	983	-
Mov Cap-2 Maneuver	~ 312	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	621	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	136.6	0	0.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	983	-
HCM Lane V/C Ratio	-	-	1.161	0.029	-
HCM Control Delay (s)	-	-	136.6	8.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	15.6	0.1	-

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	474	15	42	177	73	8	56	34	126	62	14
Future Volume (veh/h)	52	474	15	42	177	73	8	56	34	126	62	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	56	510	15	45	190	65	9	60	37	135	67	9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	83	705	21	69	498	170	14	92	56	225	204	27
Arrive On Green	0.05	0.40	0.40	0.04	0.39	0.39	0.09	0.09	0.09	0.13	0.13	0.13
Sat Flow, veh/h	1739	1765	52	1697	1269	434	150	1000	617	1753	1589	213
Grp Volume(v), veh/h	56	0	525	45	0	255	106	0	0	135	0	76
Grp Sat Flow(s),veh/h/ln	1739	0	1817	1697	0	1703	1767	0	0	1753	0	1802
Q Serve(g_s), s	1.1	0.0	8.6	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.4
Cycle Q Clear(g_c), s	1.1	0.0	8.6	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.4
Prop In Lane	1.00		0.03	1.00		0.25	0.08		0.35	1.00		0.12
Lane Grp Cap(c), veh/h	83	0	726	69	0	668	162	0	0	225	0	231
V/C Ratio(X)	0.67	0.00	0.72	0.66	0.00	0.38	0.66	0.00	0.00	0.60	0.00	0.33
Avail Cap(c_a), veh/h	542	0	3245	433	0	2946	1052	0	0	994	0	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	8.9	16.7	0.0	7.7	15.5	0.0	0.0	14.5	0.0	14.0
Incr Delay (d2), s/veh	9.0	0.0	1.4	10.1	0.0	0.4	4.4	0.0	0.0	2.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	2.2	0.5	0.0	0.9	0.8	0.0	0.0	0.9	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	0.0	10.3	26.8	0.0	8.0	19.9	0.0	0.0	17.1	0.0	14.8
LnGrp LOS	C	A	B	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		581			300			106			211	
Approach Delay, s/veh		11.8			10.8			19.9			16.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	4.7	16.8		6.2	4.4	17.1				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		20.0	11.0	61.0		21.0	9.0	63.0				
Max Q Clear Time (g_c+I1), s		4.6	3.1	5.8		4.0	2.9	10.6				
Green Ext Time (p_c), s		0.6	0.0	1.6		0.4	0.0	3.6				

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

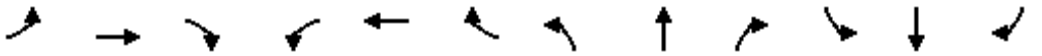
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	690	17	43	290	10	11	0	29	9	0	2
Future Vol, veh/h	1	690	17	43	290	10	11	0	29	9	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	1	750	18	47	315	11	12	0	32	10	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	315	0	0	750	0	0	1170	1170	759	1167	1167	321
Stage 1	-	-	-	-	-	-	761	761	-	415	415	-
Stage 2	-	-	-	-	-	-	409	409	-	752	752	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1234	-	-	824	-	-	167	190	402	165	188	704
Stage 1	-	-	-	-	-	-	393	410	-	601	581	-
Stage 2	-	-	-	-	-	-	613	591	-	392	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1234	-	-	824	-	-	157	177	402	144	175	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	157	177	-	144	175	-
Stage 1	-	-	-	-	-	-	393	410	-	600	540	-
Stage 2	-	-	-	-	-	-	568	550	-	361	408	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	12.1	26.9
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	554	1234	-	-	824	-	-	176
HCM Lane V/C Ratio	0.078	0.001	-	-	0.057	-	-	0.068
HCM Control Delay (s)	12.1	7.9	0	-	9.6	0	-	26.9
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	303	425	303	262	0	0	0	0	273	2	81
Future Volume (veh/h)	0	303	425	303	262	0	0	0	0	273	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	329	420	329	285	0				297	2	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	339	432	315	1229	0				295	2	79
Arrive On Green	0.00	0.47	0.47	0.31	1.00	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	719	918	1682	1767	0				1285	9	346
Grp Volume(v), veh/h	0	0	749	329	285	0				379	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1638	1682	1767	0				1640	0	0
Q Serve(g_s), s	0.0	0.0	53.5	22.5	0.0	0.0				27.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	53.5	22.5	0.0	0.0				27.5	0.0	0.0
Prop In Lane	0.00		0.56	1.00		0.00				0.78		0.21
Lane Grp Cap(c), veh/h	0	0	771	315	1229	0				376	0	0
V/C Ratio(X)	0.00	0.00	0.97	1.04	0.23	0.00				1.01	0.00	0.00
Avail Cap(c_a), veh/h	0	0	771	315	1229	0				376	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.53	0.53	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	31.0	41.2	0.0	0.0				46.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	26.2	48.5	0.2	0.0				48.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	25.3	12.2	0.1	0.0				16.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	57.1	89.8	0.2	0.0				94.8	0.0	0.0
LnGrp LOS	A	A	E	F	A	A				F	A	A
Approach Vol, veh/h		749			614						379	
Approach Delay, s/veh		57.1			48.2						94.8	
Approach LOS		E			D						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		88.0		32.0	27.0	61.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		83.5		27.5	22.5	56.5						
Max Q Clear Time (g_c+I1), s		2.0		29.5	24.5	55.5						
Green Ext Time (p_c), s		1.7		0.0	0.0	0.5						

Intersection Summary												
HCM 6th Ctrl Delay			62.2									
HCM 6th LOS			E									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	527	0	0	446	253	119	0	359	0	0	0
Future Volume (veh/h)	49	527	0	0	446	253	119	0	359	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	52	555	0	0	469	250	125	0	283			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	66	1155	0	0	614	327	135	0	306			
Arrive On Green	0.01	0.21	0.00	0.00	0.57	0.57	0.28	0.00	0.28			
Sat Flow, veh/h	1711	1796	0	0	1084	578	479	0	1084			
Grp Volume(v), veh/h	52	555	0	0	0	719	408	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1661	1562	0	0			
Q Serve(g_s), s	3.6	32.5	0.0	0.0	0.0	39.7	30.4	0.0	0.0			
Cycle Q Clear(g_c), s	3.6	32.5	0.0	0.0	0.0	39.7	30.4	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.35	0.31		0.69			
Lane Grp Cap(c), veh/h	66	1155	0	0	0	941	441	0	0			
V/C Ratio(X)	0.79	0.48	0.00	0.00	0.00	0.76	0.93	0.00	0.00			
Avail Cap(c_a), veh/h	93	1155	0	0	0	941	514	0	0			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.14	0.14	0.00	0.00	0.00	0.68	1.00	0.00	0.00			
Uniform Delay (d), s/veh	58.7	29.7	0.0	0.0	0.0	19.9	41.8	0.0	0.0			
Incr Delay (d2), s/veh	4.2	0.2	0.0	0.0	0.0	4.1	21.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	15.6	0.0	0.0	0.0	15.1	14.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.9	29.9	0.0	0.0	0.0	23.9	62.8	0.0	0.0			
LnGrp LOS	E	C	A	A	A	C	E	A	A			
Approach Vol, veh/h		607			719			408				
Approach Delay, s/veh		32.7			23.9			62.8				
Approach LOS		C			C			E				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.1	72.5		38.4		81.6						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	6.5	60.5		39.5		71.5						
Max Q Clear Time (g_c+I1), s	5.6	41.7		32.4		34.5						
Green Ext Time (p_c), s	0.0	4.8		1.4		3.8						

Intersection Summary		
HCM 6th Ctrl Delay		36.2
HCM 6th LOS		D

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	20	73	59	13	12	38	111	19	6	93	4
Future Vol, veh/h	2	20	73	59	13	12	38	111	19	6	93	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	2	21	77	62	14	13	40	117	20	6	98	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	8.5	8.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	2%	70%	6%
Vol Thru, %	66%	21%	15%	90%
Vol Right, %	11%	77%	14%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	95	84	103
LT Vol	38	2	59	6
Through Vol	111	20	13	93
RT Vol	19	73	12	4
Lane Flow Rate	177	100	88	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.221	0.12	0.118	0.137
Departure Headway (Hd)	4.489	4.314	4.796	4.56
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	799	830	747	786
Service Time	2.515	2.343	2.827	2.589
HCM Lane V/C Ratio	0.222	0.12	0.118	0.137
HCM Control Delay	8.8	7.9	8.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.4	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	341	388	157	68	214	32	121	84	70	48	96	364
Future Volume (veh/h)	341	388	157	68	214	32	121	84	70	48	96	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	355	404	155	71	223	30	126	88	52	50	100	294
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	407	467	179	90	298	40	218	134	79	509	119	350
Arrive On Green	0.24	0.38	0.38	0.05	0.19	0.19	0.13	0.13	0.13	0.29	0.29	0.29
Sat Flow, veh/h	1711	1236	474	1711	1550	208	1725	1062	627	1753	410	1206
Grp Volume(v), veh/h	355	0	559	71	0	253	126	0	140	50	0	394
Grp Sat Flow(s),veh/h/ln	1711	0	1710	1711	0	1758	1725	0	1689	1753	0	1616
Q Serve(g_s), s	15.7	0.0	23.7	3.2	0.0	10.7	5.4	0.0	6.2	1.6	0.0	18.0
Cycle Q Clear(g_c), s	15.7	0.0	23.7	3.2	0.0	10.7	5.4	0.0	6.2	1.6	0.0	18.0
Prop In Lane	1.00		0.28	1.00		0.12	1.00		0.37	1.00		0.75
Lane Grp Cap(c), veh/h	407	0	646	90	0	339	218	0	213	509	0	469
V/C Ratio(X)	0.87	0.00	0.86	0.79	0.00	0.75	0.58	0.00	0.66	0.10	0.00	0.84
Avail Cap(c_a), veh/h	872	0	1350	174	0	672	681	0	667	938	0	865
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	22.6	36.8	0.0	29.9	32.3	0.0	32.7	20.4	0.0	26.1
Incr Delay (d2), s/veh	5.9	0.0	3.6	14.0	0.0	3.3	2.4	0.0	3.4	0.1	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	9.1	1.6	0.0	4.5	2.3	0.0	2.6	0.6	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	0.0	26.2	50.8	0.0	33.2	34.8	0.0	36.1	20.4	0.0	30.3
LnGrp LOS	C	A	C	D	A	C	C	A	D	C	A	C
Approach Vol, veh/h		914			324			266			444	
Approach Delay, s/veh		29.5			37.0			35.5			29.1	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	25.8	21.7	18.1	12.9	7.1	32.7
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	42.0	40.0	30.0	31.0	8.0	62.0
Max Q Clear Time (g_c+I1), s	20.0	17.7	12.7	8.2	5.2	25.7
Green Ext Time (p_c), s	2.6	1.0	1.2	1.1	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	17	32	73	42	50
Future Vol, veh/h	28	17	32	73	42	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	33	20	37	85	49	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	166	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1478	-	-	-	827	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	808	983
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	895
HCM Lane V/C Ratio	0.022	-	-	-	0.12
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	453	276	49	36	38
Future Vol, veh/h	53	453	276	49	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	56	482	294	52	38	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	294	0	-	0	888	294
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	594	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1234	-	-	0	315	748
Stage 1	-	-	-	0	759	-
Stage 2	-	-	-	0	554	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1234	-	-	-	301	748
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1234	-	-	619
HCM Lane V/C Ratio	0.046	-	-	0.127
HCM Control Delay (s)	8.1	-	-	11.7
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	177	5	7	276
Future Vol, veh/h	1	2	177	5	7	276
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	1	2	211	6	8	329

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	556	211	0	-	211	0
Stage 1	211	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	496	834	-	0	1360	-
Stage 1	829	-	-	0	-	-
Stage 2	722	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	493	834	-	-	1360	-
Mov Cap-2 Maneuver	493	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	678	1360	-
HCM Lane V/C Ratio	-	0.005	0.006	-
HCM Control Delay (s)	-	10.3	7.7	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	1	167	40	1	224
Future Vol, veh/h	40	1	167	40	1	224
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	1	182	43	1	243

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	449	204	0	0	225	0
Stage 1	204	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	568	837	-	-	1344	-
Stage 1	830	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	567	837	-	-	1344	-
Mov Cap-2 Maneuver	567	-	-	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	571	1344	-
HCM Lane V/C Ratio	-	-	0.078	0.001	-
HCM Control Delay (s)	-	-	11.8	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

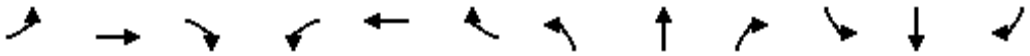
Intersection	
Int Delay, s/veh	7.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	256	12	195	262	12	252
Future Vol, veh/h	256	12	195	262	12	252
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	278	13	212	285	13	274

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	655	355	0	0	497	0
Stage 1	355	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	431	689	-	-	1067	-
Stage 1	710	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	425	689	-	-	1067	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.9	0	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	432	1067	-
HCM Lane V/C Ratio	-	-	0.674	0.012	-
HCM Control Delay (s)	-	-	28.9	8.4	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	4.9	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	231	5	39	348	57	10	57	29	94	28	55
Future Volume (veh/h)	42	231	5	39	348	57	10	57	29	94	28	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	251	4	42	378	57	11	62	32	102	30	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	65	586	9	65	539	81	17	93	48	195	151	45
Arrive On Green	0.04	0.37	0.37	0.04	0.37	0.37	0.10	0.10	0.10	0.11	0.11	0.11
Sat Flow, veh/h	1541	1589	25	1654	1475	222	173	976	504	1725	1338	401
Grp Volume(v), veh/h	46	0	255	42	0	435	105	0	0	102	0	39
Grp Sat Flow(s),veh/h/ln	1541	0	1614	1654	0	1697	1652	0	0	1725	0	1739
Q Serve(g_s), s	0.9	0.0	3.7	0.8	0.0	6.8	1.9	0.0	0.0	1.7	0.0	0.6
Cycle Q Clear(g_c), s	0.9	0.0	3.7	0.8	0.0	6.8	1.9	0.0	0.0	1.7	0.0	0.6
Prop In Lane	1.00		0.02	1.00		0.13	0.10		0.30	1.00		0.23
Lane Grp Cap(c), veh/h	65	0	595	65	0	621	158	0	0	195	0	196
V/C Ratio(X)	0.71	0.00	0.43	0.65	0.00	0.70	0.66	0.00	0.00	0.52	0.00	0.20
Avail Cap(c_a), veh/h	591	0	3147	476	0	3147	1268	0	0	1048	0	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	7.4	14.8	0.0	8.5	13.7	0.0	0.0	13.1	0.0	12.6
Incr Delay (d2), s/veh	13.2	0.0	0.5	10.4	0.0	1.5	4.7	0.0	0.0	2.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.7	0.4	0.0	1.5	0.7	0.0	0.0	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	7.9	25.3	0.0	9.9	18.4	0.0	0.0	15.3	0.0	13.1
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		301			477			105			141	
Approach Delay, s/veh		11.0			11.3			18.4			14.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.5	4.3	14.4		6.0	4.2	14.5				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		19.0	12.0	58.0		24.0	9.0	61.0				
Max Q Clear Time (g_c+I1), s		3.7	2.9	8.8		3.9	2.8	5.7				
Green Ext Time (p_c), s		0.3	0.0	2.9		0.4	0.0	1.5				

Intersection Summary												
HCM 6th Ctrl Delay			12.4									
HCM 6th LOS			B									

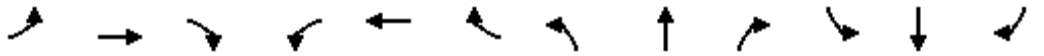
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	371	6	20	469	2	26	0	20	2	1	0
Future Vol, veh/h	0	371	6	20	469	2	26	0	20	2	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	426	7	23	539	2	30	0	23	2	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	539	0	0	426	0	0	1016	1015	430	1012	1012	540
Stage 1	-	-	-	-	-	-	430	430	-	586	586	-
Stage 2	-	-	-	-	-	-	586	585	-	426	426	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	940	-	-	1082	-	-	216	238	625	166	186	435
Stage 1	-	-	-	-	-	-	603	583	-	400	407	-
Stage 2	-	-	-	-	-	-	496	498	-	497	489	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	940	-	-	1082	-	-	210	231	625	156	180	435
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	231	-	156	180	-
Stage 1	-	-	-	-	-	-	603	583	-	400	395	-
Stage 2	-	-	-	-	-	-	480	483	-	479	489	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	16.3	27.6
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	372	940	-	-	1082	-	-	163
HCM Lane V/C Ratio	0.142	-	-	-	0.021	-	-	0.021
HCM Control Delay (s)	16.3	0	-	-	8.4	0	-	27.6
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	200	193	322	439	0	0	0	0	180	0	52
Future Volume (veh/h)	0	200	193	322	439	0	0	0	0	180	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	217	185	350	477	0				196	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	400	341	371	1325	0				222	0	10
Arrive On Green	0.00	0.51	0.51	0.45	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	792	675	1640	1722	0				1425	0	65
Grp Volume(v), veh/h	0	0	402	350	477	0				205	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1467	1640	1722	0				1491	0	0
Q Serve(g_s), s	0.0	0.0	22.4	24.4	0.0	0.0				16.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	22.4	24.4	0.0	0.0				16.2	0.0	0.0
Prop In Lane	0.00		0.46	1.00		0.00				0.96		0.04
Lane Grp Cap(c), veh/h	0	0	742	371	1325	0				232	0	0
V/C Ratio(X)	0.00	0.00	0.54	0.94	0.36	0.00				0.88	0.00	0.00
Avail Cap(c_a), veh/h	0	0	742	485	1325	0				304	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	20.2	32.1	0.0	0.0				49.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.8	3.5	0.1	0.0				20.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	7.9	7.4	0.0	0.0				7.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	23.0	35.6	0.1	0.0				70.4	0.0	0.0
LnGrp LOS	A	A	C	D	A	A				E	A	A
Approach Vol, veh/h		402			827						205	
Approach Delay, s/veh		23.0			15.1						70.4	
Approach LOS		C			B						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		96.8		23.2	31.7	65.2						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		86.5		24.5	35.5	46.5						
Max Q Clear Time (g_c+I1), s		2.0		18.2	26.4	24.4						
Green Ext Time (p_c), s		3.2		0.5	0.7	2.5						

Intersection Summary												
HCM 6th Ctrl Delay			25.2									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	328	0	0	613	400	148	0	256	0	0	0
Future Volume (veh/h)	52	328	0	0	613	400	148	0	256	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	54	342	0	0	639	399	154	0	215			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	66	1069	0	0	608	380	149	0	208			
Arrive On Green	0.01	0.22	0.00	0.00	0.60	0.60	0.25	0.00	0.25			
Sat Flow, veh/h	1499	1574	0	0	1017	635	605	0	845			
Grp Volume(v), veh/h	54	342	0	0	0	1038	369	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1652	1451	0	0			
Q Serve(g_s), s	4.3	21.8	0.0	0.0	0.0	71.7	29.5	0.0	0.0			
Cycle Q Clear(g_c), s	4.3	21.8	0.0	0.0	0.0	71.7	29.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.38	0.42		0.58			
Lane Grp Cap(c), veh/h	66	1069	0	0	0	988	357	0	0			
V/C Ratio(X)	0.82	0.32	0.00	0.00	0.00	1.05	1.03	0.00	0.00			
Avail Cap(c_a), veh/h	69	1069	0	0	0	988	357	0	0			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.76	0.76	0.00	0.00	0.00	0.11	1.00	0.00	0.00			
Uniform Delay (d), s/veh	58.7	23.4	0.0	0.0	0.0	24.1	45.3	0.0	0.0			
Incr Delay (d2), s/veh	41.7	0.6	0.0	0.0	0.0	26.5	56.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.4	9.3	0.0	0.0	0.0	32.0	15.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.3	24.0	0.0	0.0	0.0	50.6	102.1	0.0	0.0			
LnGrp LOS	F	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		396			1038			369				
Approach Delay, s/veh		34.4			50.6			102.1				
Approach LOS		C			D			F				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.8	76.2		34.0		86.0						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	5.5	71.5		29.5		81.5						
Max Q Clear Time (g_c+I1), s	6.3	73.7		31.5		23.8						
Green Ext Time (p_c), s	0.0	0.0		0.0		2.1						

Intersection Summary	
HCM 6th Ctrl Delay	57.6
HCM 6th LOS	E

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	15	77	96	37	29	89	99	30	21	181	12
Future Vol, veh/h	7	15	77	96	37	29	89	99	30	21	181	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	8	17	89	110	43	33	102	114	34	24	208	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	10.6	11.2	10.9
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	41%	7%	59%	10%
Vol Thru, %	45%	15%	23%	85%
Vol Right, %	14%	78%	18%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	218	99	162	214
LT Vol	89	7	96	21
Through Vol	99	15	37	181
RT Vol	30	77	29	12
Lane Flow Rate	251	114	186	246
Geometry Grp	1	1	1	1
Degree of Util (X)	0.362	0.166	0.281	0.35
Departure Headway (Hd)	5.194	5.24	5.431	5.123
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	694	684	661	703
Service Time	3.222	3.277	3.464	3.152
HCM Lane V/C Ratio	0.362	0.167	0.281	0.35
HCM Control Delay	11.2	9.3	10.6	10.9
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.7	0.6	1.2	1.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	209	80	40	377	61	219	134	73	50	149	417
Future Volume (veh/h)	295	209	80	40	377	61	219	134	73	50	149	417
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	307	218	75	42	393	60	228	140	64	52	155	369
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	307	486	167	53	374	57	262	179	82	542	147	350
Arrive On Green	0.20	0.42	0.42	0.03	0.25	0.25	0.15	0.15	0.15	0.31	0.31	0.31
Sat Flow, veh/h	1541	1151	396	1654	1472	225	1697	1157	529	1753	476	1132
Grp Volume(v), veh/h	307	0	293	42	0	453	228	0	204	52	0	524
Grp Sat Flow(s),veh/h/ln	1541	0	1547	1654	0	1697	1697	0	1686	1753	0	1608
Q Serve(g_s), s	29.0	0.0	19.6	3.7	0.0	37.0	19.1	0.0	16.9	3.1	0.0	45.0
Cycle Q Clear(g_c), s	29.0	0.0	19.6	3.7	0.0	37.0	19.1	0.0	16.9	3.1	0.0	45.0
Prop In Lane	1.00		0.26	1.00		0.13	1.00		0.31	1.00		0.70
Lane Grp Cap(c), veh/h	307	0	653	53	0	432	262	0	260	542	0	497
V/C Ratio(X)	1.00	0.00	0.45	0.80	0.00	1.05	0.87	0.00	0.78	0.10	0.00	1.05
Avail Cap(c_a), veh/h	307	0	653	114	0	432	373	0	371	542	0	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.2	0.0	30.0	69.9	0.0	54.2	60.1	0.0	59.2	35.7	0.0	50.2
Incr Delay (d2), s/veh	51.0	0.0	0.5	22.9	0.0	57.0	14.4	0.0	6.9	0.1	0.0	55.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	0.0	7.3	1.9	0.0	22.3	9.2	0.0	7.6	1.3	0.0	25.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.3	0.0	30.5	92.8	0.0	111.2	74.5	0.0	66.1	35.8	0.0	105.3
LnGrp LOS	F	A	C	F	A	F	E	A	E	D	A	F
Approach Vol, veh/h		600			495			432			576	
Approach Delay, s/veh		70.8			109.6			70.5			99.1	
Approach LOS		E			F			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	48.0	32.0	40.0	25.5	7.6	64.4
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	45.0	29.0	37.0	32.0	10.0	56.0
Max Q Clear Time (g_c+I1), s	47.0	31.0	39.0	21.1	5.7	21.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	87.6
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	20	57	58	54	107
Future Vol, veh/h	35	20	57	58	54	107
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	42	24	69	70	65	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	215	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	108	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1423	-	-	-	775	950
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	747	947
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	869
HCM Lane V/C Ratio	0.03	-	-	-	0.223
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	284	449	60	38	29
Future Vol, veh/h	48	284	449	60	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	50	296	468	63	40	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	468	0	-	0	864	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	396	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	997	-	-	0	327	599
Stage 1	-	-	-	0	634	-
Stage 2	-	-	-	0	684	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	997	-	-	-	311	599
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	997	-	-	548
HCM Lane V/C Ratio	0.05	-	-	0.127
HCM Control Delay (s)	8.8	-	-	12.5
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	0.4

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	359	1	8	167
Future Vol, veh/h	8	10	359	1	8	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	10	12	427	1	10	199

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	646	427	0	-	427	0
Stage 1	427	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	421	607	-	0	1116	-
Stage 1	637	-	-	0	-	-
Stage 2	794	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	417	607	-	-	1116	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	794	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	505	1116	-
HCM Lane V/C Ratio	-	0.042	0.009	-
HCM Control Delay (s)	-	12.4	8.3	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	30	217	352	2
Future Vol, veh/h	1	0	30	217	352	2
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	33	236	383	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	686	384	385	0	-	0
Stage 1	384	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	413	664	1173	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	400	664	1173	-	-	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	400	-	-
HCM Lane V/C Ratio	0.028	-	0.003	-	-
HCM Control Delay (s)	8.2	0	14	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	35	0	246	352	0
Future Vol, veh/h	1	35	0	246	352	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	0	267	383	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	650	383	383	0	-	0
Stage 1	383	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	434	664	1175	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	434	664	1175	-	-	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	778	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	654	-	-
HCM Lane V/C Ratio	-	-	0.06	-	-
HCM Control Delay (s)	0	-	10.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

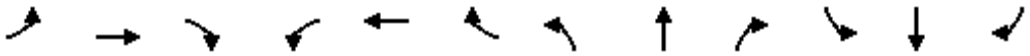
Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	252	265	225	364	23
Future Vol, veh/h	21	252	265	225	364	23
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	274	288	245	396	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1230	409	421	0	-	0
Stage 1	409	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	196	642	1138	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	139	642	1138	-	-	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	474	-	-	-	-	-
Stage 2	432	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22	5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1138	-	502	-	-
HCM Lane V/C Ratio	0.253	-	0.591	-	-
HCM Control Delay (s)	9.2	0	22	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	1	-	3.8	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	475	15	42	178	73	8	56	34	126	62	14
Future Volume (veh/h)	52	475	15	42	178	73	8	56	34	126	62	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	56	511	15	45	191	65	9	60	37	135	67	9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	83	706	21	69	499	170	14	92	56	225	204	27
Arrive On Green	0.05	0.40	0.40	0.04	0.39	0.39	0.09	0.09	0.09	0.13	0.13	0.13
Sat Flow, veh/h	1739	1765	52	1697	1271	433	150	1000	617	1753	1589	213
Grp Volume(v), veh/h	56	0	526	45	0	256	106	0	0	135	0	76
Grp Sat Flow(s),veh/h/ln	1739	0	1817	1697	0	1704	1767	0	0	1753	0	1802
Q Serve(g_s), s	1.1	0.0	8.6	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.4
Cycle Q Clear(g_c), s	1.1	0.0	8.6	0.9	0.0	3.8	2.0	0.0	0.0	2.6	0.0	1.4
Prop In Lane	1.00		0.03	1.00		0.25	0.08		0.35	1.00		0.12
Lane Grp Cap(c), veh/h	83	0	727	69	0	669	162	0	0	225	0	231
V/C Ratio(X)	0.67	0.00	0.72	0.66	0.00	0.38	0.66	0.00	0.00	0.60	0.00	0.33
Avail Cap(c_a), veh/h	542	0	3241	432	0	2943	1051	0	0	993	0	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	8.9	16.7	0.0	7.7	15.5	0.0	0.0	14.5	0.0	14.0
Incr Delay (d2), s/veh	9.0	0.0	1.4	10.2	0.0	0.4	4.4	0.0	0.0	2.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	2.2	0.5	0.0	0.8	0.8	0.0	0.0	0.9	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	0.0	10.3	26.9	0.0	8.0	19.9	0.0	0.0	17.1	0.0	14.8
LnGrp LOS	C	A	B	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		582			301			106			211	
Approach Delay, s/veh		11.8			10.8			19.9			16.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.5	4.7	16.9		6.2	4.4	17.1				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		20.0	11.0	61.0		21.0	9.0	63.0				
Max Q Clear Time (g_c+I1), s		4.6	3.1	5.8		4.0	2.9	10.6				
Green Ext Time (p_c), s		0.6	0.0	1.6		0.4	0.0	3.6				

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

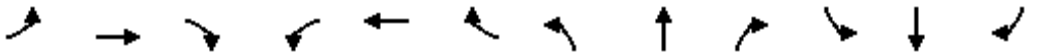
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	691	17	43	291	10	11	0	29	9	0	2
Future Vol, veh/h	1	691	17	43	291	10	11	0	29	9	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	1	751	18	47	316	11	12	0	32	10	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	316	0	0	751	0	0	1172	1172	760	1169	1169	322
Stage 1	-	-	-	-	-	-	762	762	-	416	416	-
Stage 2	-	-	-	-	-	-	410	410	-	753	753	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1233	-	-	823	-	-	167	190	401	165	187	703
Stage 1	-	-	-	-	-	-	393	409	-	600	580	-
Stage 2	-	-	-	-	-	-	613	590	-	391	407	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1233	-	-	823	-	-	157	177	401	144	174	703
Mov Cap-2 Maneuver	-	-	-	-	-	-	157	177	-	144	174	-
Stage 1	-	-	-	-	-	-	393	409	-	599	539	-
Stage 2	-	-	-	-	-	-	568	549	-	360	407	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	12.1	26.9
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	553	1233	-	-	823	-	-	176
HCM Lane V/C Ratio	0.079	0.001	-	-	0.057	-	-	0.068
HCM Control Delay (s)	12.1	7.9	0	-	9.6	0	-	26.9
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	304	425	285	263	0	0	0	0	255	2	81
Future Volume (veh/h)	0	304	425	285	263	0	0	0	0	255	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	330	421	310	286	0				277	2	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	340	434	315	1232	0				289	2	81
Arrive On Green	0.00	0.47	0.47	0.06	0.23	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	720	918	1682	1767	0				1271	9	358
Grp Volume(v), veh/h	0	0	751	310	286	0				357	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1638	1682	1767	0				1639	0	0
Q Serve(g_s), s	0.0	0.0	53.6	22.1	15.8	0.0				25.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	53.6	22.1	15.8	0.0				25.8	0.0	0.0
Prop In Lane	0.00		0.56	1.00		0.00				0.78		0.22
Lane Grp Cap(c), veh/h	0	0	774	315	1232	0				373	0	0
V/C Ratio(X)	0.00	0.00	0.97	0.98	0.23	0.00				0.96	0.00	0.00
Avail Cap(c_a), veh/h	0	0	774	315	1232	0				373	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.58	0.58	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	30.8	56.1	20.1	0.0				45.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	25.9	34.0	0.3	0.0				35.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	25.3	12.9	7.5	0.0				13.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	56.8	90.1	20.3	0.0				81.3	0.0	0.0
LnGrp LOS	A	A	E	F	C	A				F	A	A
Approach Vol, veh/h		751			596						357	
Approach Delay, s/veh		56.8			56.6						81.3	
Approach LOS		E			E						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		88.2		31.8	27.0	61.2						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		83.7		27.3	22.5	56.7						
Max Q Clear Time (g_c+I1), s		17.8		27.8	24.1	55.6						
Green Ext Time (p_c), s		1.7		0.0	0.0	0.6						

Intersection Summary												
HCM 6th Ctrl Delay			61.9									
HCM 6th LOS			E									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	510	0	0	429	235	119	0	341	0	0	0
Future Volume (veh/h)	49	510	0	0	429	235	119	0	341	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	52	537	0	0	452	232	125	0	267			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	66	1170	0	0	633	325	136	0	291			
Arrive On Green	0.05	0.87	0.00	0.00	0.58	0.58	0.27	0.00	0.27			
Sat Flow, veh/h	1711	1796	0	0	1100	564	499	0	1066			
Grp Volume(v), veh/h	52	537	0	0	0	684	392	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1664	1565	0	0			
Q Serve(g_s), s	3.6	7.9	0.0	0.0	0.0	35.6	29.1	0.0	0.0			
Cycle Q Clear(g_c), s	3.6	7.9	0.0	0.0	0.0	35.6	29.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.34	0.32		0.68			
Lane Grp Cap(c), veh/h	66	1170	0	0	0	958	428	0	0			
V/C Ratio(X)	0.79	0.46	0.00	0.00	0.00	0.71	0.92	0.00	0.00			
Avail Cap(c_a), veh/h	110	1170	0	0	0	958	531	0	0			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.17	0.17	0.00	0.00	0.00	0.74	1.00	0.00	0.00			
Uniform Delay (d), s/veh	56.4	3.3	0.0	0.0	0.0	18.4	42.3	0.0	0.0			
Incr Delay (d2), s/veh	3.6	0.2	0.0	0.0	0.0	3.4	18.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	2.0	0.0	0.0	0.0	13.5	13.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	3.5	0.0	0.0	0.0	21.7	60.6	0.0	0.0			
LnGrp LOS	E	A	A	A	A	C	E	A	A			
Approach Vol, veh/h		589			684			392				
Approach Delay, s/veh		8.5			21.7			60.6				
Approach LOS		A			C			E				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.1	73.6		37.3		82.7						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	7.3	58.1		40.7		70.3						
Max Q Clear Time (g_c+I1), s	5.6	37.6		31.1		9.9						
Green Ext Time (p_c), s	0.0	4.7		1.7		3.7						

Intersection Summary												
HCM 6th Ctrl Delay			26.2									
HCM 6th LOS			C									

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	20	73	59	13	12	38	111	19	6	93	4
Future Vol, veh/h	2	20	73	59	13	12	38	111	19	6	93	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	2	21	77	62	14	13	40	117	20	6	98	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	8.5	8.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	2%	70%	6%
Vol Thru, %	66%	21%	15%	90%
Vol Right, %	11%	77%	14%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	95	84	103
LT Vol	38	2	59	6
Through Vol	111	20	13	93
RT Vol	19	73	12	4
Lane Flow Rate	177	100	88	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.221	0.12	0.118	0.137
Departure Headway (Hd)	4.489	4.314	4.796	4.56
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	799	830	747	786
Service Time	2.515	2.343	2.827	2.589
HCM Lane V/C Ratio	0.222	0.12	0.118	0.137
HCM Control Delay	8.8	7.9	8.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.4	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	391	157	68	216	31	121	84	70	46	96	327
Future Volume (veh/h)	303	391	157	68	216	31	121	84	70	46	96	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	316	407	155	71	225	29	126	88	52	48	100	265
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	370	475	181	90	342	44	222	137	81	480	122	322
Arrive On Green	0.22	0.38	0.38	0.05	0.22	0.22	0.13	0.13	0.13	0.27	0.27	0.27
Sat Flow, veh/h	1711	1239	472	1711	1559	201	1725	1062	627	1753	444	1177
Grp Volume(v), veh/h	316	0	562	71	0	254	126	0	140	48	0	365
Grp Sat Flow(s),veh/h/ln	1711	0	1711	1711	0	1760	1725	0	1689	1753	0	1621
Q Serve(g_s), s	13.2	0.0	22.4	3.0	0.0	9.8	5.1	0.0	5.8	1.5	0.0	15.6
Cycle Q Clear(g_c), s	13.2	0.0	22.4	3.0	0.0	9.8	5.1	0.0	5.8	1.5	0.0	15.6
Prop In Lane	1.00		0.28	1.00		0.11	1.00		0.37	1.00		0.73
Lane Grp Cap(c), veh/h	370	0	655	90	0	386	222	0	217	480	0	444
V/C Ratio(X)	0.85	0.00	0.86	0.79	0.00	0.66	0.57	0.00	0.64	0.10	0.00	0.82
Avail Cap(c_a), veh/h	877	0	1454	185	0	784	768	0	752	923	0	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	21.0	34.7	0.0	26.4	30.3	0.0	30.7	20.1	0.0	25.2
Incr Delay (d2), s/veh	5.6	0.0	3.4	14.1	0.0	1.9	2.3	0.0	3.2	0.1	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	8.5	1.6	0.0	4.0	2.1	0.0	2.4	0.6	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	24.4	48.8	0.0	28.3	32.6	0.0	33.9	20.2	0.0	29.1
LnGrp LOS	C	A	C	D	A	C	C	A	C	C	A	C
Approach Vol, veh/h		878			325			266			413	
Approach Delay, s/veh		27.7			32.8			33.3			28.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	23.3	19.0	19.3	12.5	6.9	31.4
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	39.0	38.0	33.0	33.0	8.0	63.0
Max Q Clear Time (g_c+I1), s	17.6	15.2	11.8	7.8	5.0	24.4
Green Ext Time (p_c), s	2.3	0.9	1.3	1.1	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	17	32	73	42	50
Future Vol, veh/h	28	17	32	73	42	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	33	20	37	85	49	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	166	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1478	-	-	-	827	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	808	983
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	895
HCM Lane V/C Ratio	0.022	-	-	-	0.12
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	454	277	49	36	38
Future Vol, veh/h	53	454	277	49	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	56	483	295	52	38	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	295	0	-	0	890	295
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1233	-	-	0	315	747
Stage 1	-	-	-	0	758	-
Stage 2	-	-	-	0	553	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1233	-	-	-	301	747
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1233	-	-	619
HCM Lane V/C Ratio	0.046	-	-	0.127
HCM Control Delay (s)	8.1	-	-	11.7
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	178	5	6	276
Future Vol, veh/h	1	1	178	5	6	276
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	1	1	212	6	7	329

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	555	212	0	-	212	0
Stage 1	212	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	496	833	-	0	1358	-
Stage 1	828	-	-	0	-	-
Stage 2	723	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	494	833	-	-	1358	-
Mov Cap-2 Maneuver	494	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	620	1358	-
HCM Lane V/C Ratio	-	0.004	0.005	-
HCM Control Delay (s)	-	10.8	7.7	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	26	168	224	1
Future Vol, veh/h	1	0	26	168	224	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	28	183	243	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	483	244	244	0	-	0
Stage 1	244	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	542	795	1322	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	529	795	1322	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	801	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1322	-	529	-	-
HCM Lane V/C Ratio	0.021	-	0.002	-	-
HCM Control Delay (s)	7.8	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	31	0	193	224	0
Future Vol, veh/h	1	31	0	193	224	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	34	0	210	243	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	453	243	243	0	-	0
Stage 1	243	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	565	796	1323	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	565	796	1323	-	-	-
Mov Cap-2 Maneuver	565	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	825	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1323	-	786	-	-
HCM Lane V/C Ratio	-	-	0.044	-	-
HCM Control Delay (s)	0	-	9.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

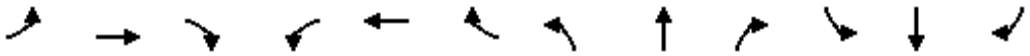
Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	222	233	185	247	8
Future Vol, veh/h	8	222	233	185	247	8
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	241	253	201	268	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	980	273	277	0	-	0
Stage 1	273	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	277	766	1286	-	-	-
Stage 1	773	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	216	766	1286	-	-	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	489	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	4.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1286	-	704	-	-
HCM Lane V/C Ratio	0.197	-	0.355	-	-
HCM Control Delay (s)	8.5	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.7	-	1.6	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	243	5	42	358	58	10	57	32	95	28	55
Future Volume (veh/h)	42	243	5	42	358	58	10	57	32	95	28	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	46	264	4	46	389	58	11	62	35	103	30	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	65	600	9	69	557	83	16	91	51	193	149	45
Arrive On Green	0.04	0.38	0.38	0.04	0.38	0.38	0.10	0.10	0.10	0.11	0.11	0.11
Sat Flow, veh/h	1541	1590	24	1654	1477	220	168	946	534	1725	1338	401
Grp Volume(v), veh/h	46	0	268	46	0	447	108	0	0	103	0	39
Grp Sat Flow(s),veh/h/ln	1541	0	1614	1654	0	1697	1647	0	0	1725	0	1739
Q Serve(g_s), s	0.9	0.0	4.0	0.9	0.0	7.2	2.0	0.0	0.0	1.8	0.0	0.7
Cycle Q Clear(g_c), s	0.9	0.0	4.0	0.9	0.0	7.2	2.0	0.0	0.0	1.8	0.0	0.7
Prop In Lane	1.00		0.01	1.00		0.13	0.10		0.32	1.00		0.23
Lane Grp Cap(c), veh/h	65	0	609	69	0	640	158	0	0	193	0	194
V/C Ratio(X)	0.71	0.00	0.44	0.66	0.00	0.70	0.68	0.00	0.00	0.53	0.00	0.20
Avail Cap(c_a), veh/h	575	0	3161	566	0	3271	1024	0	0	1019	0	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	7.5	15.2	0.0	8.5	14.1	0.0	0.0	13.5	0.0	13.0
Incr Delay (d2), s/veh	13.5	0.0	0.5	10.4	0.0	1.4	5.1	0.0	0.0	2.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.4	0.0	1.6	0.8	0.0	0.0	0.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.7	0.0	8.0	25.5	0.0	9.9	19.1	0.0	0.0	15.8	0.0	13.5
LnGrp LOS	C	A	A	C	A	A	B	A	A	B	A	B
Approach Vol, veh/h		314			493			108			142	
Approach Delay, s/veh		11.0			11.3			19.1			15.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.3	15.1		6.1	4.3	15.1		6.6				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	12.0	62.0		20.0	11.0	63.0		19.0				
Max Q Clear Time (g_c+I1), s	2.9	9.2		4.0	2.9	6.0		3.8				
Green Ext Time (p_c), s	0.0	3.0		0.4	0.0	1.6		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		12.5	
HCM 6th LOS		B	

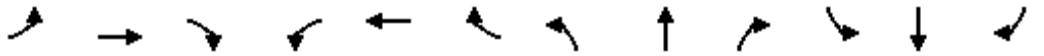
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	388	6	20	484	2	26	0	20	2	1	0
Future Vol, veh/h	0	388	6	20	484	2	26	0	20	2	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	446	7	23	556	2	30	0	23	2	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	556	0	0	446	0	0	1053	1052	450	1049	1049	557
Stage 1	-	-	-	-	-	-	450	450	-	603	603	-
Stage 2	-	-	-	-	-	-	603	602	-	446	446	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	926	-	-	1063	-	-	204	227	609	156	176	424
Stage 1	-	-	-	-	-	-	589	572	-	390	399	-
Stage 2	-	-	-	-	-	-	486	489	-	484	478	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	926	-	-	1063	-	-	198	220	609	146	171	424
Mov Cap-2 Maneuver	-	-	-	-	-	-	198	220	-	146	171	-
Stage 1	-	-	-	-	-	-	589	572	-	390	387	-
Stage 2	-	-	-	-	-	-	470	474	-	466	478	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	17.1	29.1
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	350	926	-	-	1063	-	-	153
HCM Lane V/C Ratio	0.151	-	-	-	0.022	-	-	0.023
HCM Control Delay (s)	17.1	0	-	-	8.5	0	-	29.1
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	217	193	431	454	0	0	0	0	298	0	52
Future Volume (veh/h)	0	217	193	431	454	0	0	0	0	298	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	236	184	468	493	0				324	0	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	285	222	494	1177	0				343	0	17
Arrive On Green	0.00	0.34	0.34	0.20	0.46	0.00				0.24	0.00	0.24
Sat Flow, veh/h	0	827	645	1640	1722	0				1420	0	70
Grp Volume(v), veh/h	0	0	420	468	493	0				340	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1473	1640	1722	0				1490	0	0
Q Serve(g_s), s	0.0	0.0	31.4	33.8	23.0	0.0				26.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	31.4	33.8	23.0	0.0				26.9	0.0	0.0
Prop In Lane	0.00		0.44	1.00		0.00				0.95		0.05
Lane Grp Cap(c), veh/h	0	0	508	494	1177	0				360	0	0
V/C Ratio(X)	0.00	0.00	0.83	0.95	0.42	0.00				0.94	0.00	0.00
Avail Cap(c_a), veh/h	0	0	508	513	1177	0				366	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.0	47.0	16.6	0.0				44.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	14.3	4.4	0.1	0.0				32.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	12.9	14.7	9.7	0.0				12.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	50.4	51.4	16.7	0.0				77.2	0.0	0.0
LnGrp LOS	A	A	D	D	B	A				E	A	A
Approach Vol, veh/h		420			961						340	
Approach Delay, s/veh		50.4			33.6						77.2	
Approach LOS		D			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		86.5		33.5	40.6	45.9						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		81.5		29.5	37.5	39.5						
Max Q Clear Time (g_c+I1), s		25.0		28.9	35.8	33.4						
Green Ext Time (p_c), s		3.3		0.1	0.3	1.3						

Intersection Summary												
HCM 6th Ctrl Delay			46.3									
HCM 6th LOS			D									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	463	0	0	737	513	148	0	369	0	0	0
Future Volume (veh/h)	52	463	0	0	737	513	148	0	369	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	54	482	0	0	768	513	154	0	309			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	62	1069	0	0	593	396	117	0	236			
Arrive On Green	0.01	0.22	0.00	0.00	0.60	0.60	0.25	0.00	0.25			
Sat Flow, veh/h	1499	1574	0	0	988	660	478	0	959			
Grp Volume(v), veh/h	54	482	0	0	0	1281	463	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1648	1437	0	0			
Q Serve(g_s), s	4.3	31.7	0.0	0.0	0.0	72.0	29.5	0.0	0.0			
Cycle Q Clear(g_c), s	4.3	31.7	0.0	0.0	0.0	72.0	29.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.40	0.33		0.67			
Lane Grp Cap(c), veh/h	62	1069	0	0	0	989	353	0	0			
V/C Ratio(X)	0.86	0.45	0.00	0.00	0.00	1.30	1.31	0.00	0.00			
Avail Cap(c_a), veh/h	62	1069	0	0	0	989	353	0	0			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.42	0.42	0.00	0.00	0.00	0.09	1.00	0.00	0.00			
Uniform Delay (d), s/veh	58.8	27.2	0.0	0.0	0.0	24.0	45.3	0.0	0.0			
Incr Delay (d2), s/veh	37.6	0.6	0.0	0.0	0.0	133.8	158.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.3	13.4	0.0	0.0	0.0	61.5	25.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.5	27.8	0.0	0.0	0.0	157.8	204.1	0.0	0.0			
LnGrp LOS	F	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		536			1281			463				
Approach Delay, s/veh		34.7			157.8			204.1				
Approach LOS		C			F			F				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	9.5	76.5		34.0		86.0			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.0	72.0		29.5		81.5			
Max Q Clear Time (g_c+I1), s	6.3	74.0		31.5		33.7			
Green Ext Time (p_c), s	0.0	0.0		0.0		3.2			

Intersection Summary		
HCM 6th Ctrl Delay		138.2
HCM 6th LOS		F

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	15	78	97	37	29	90	102	31	21	184	12
Future Vol, veh/h	7	15	78	97	37	29	90	102	31	21	184	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	8	17	90	111	43	33	103	117	36	24	211	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	10.7	11.3	11
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	40%	7%	60%	10%
Vol Thru, %	46%	15%	23%	85%
Vol Right, %	14%	78%	18%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	223	100	163	217
LT Vol	90	7	97	21
Through Vol	102	15	37	184
RT Vol	31	78	29	12
Lane Flow Rate	256	115	187	249
Geometry Grp	1	1	1	1
Degree of Util (X)	0.371	0.168	0.284	0.356
Departure Headway (Hd)	5.208	5.271	5.462	5.143
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	692	680	658	701
Service Time	3.236	3.308	3.495	3.172
HCM Lane V/C Ratio	0.37	0.169	0.284	0.355
HCM Control Delay	11.3	9.4	10.7	11
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.7	0.6	1.2	1.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	556	177	99	45	328	126	227	139	76	98	154	695
Future Volume (veh/h)	556	177	99	45	328	126	227	139	76	98	154	695
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	579	184	91	47	342	123	236	145	65	102	160	621
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	308	407	201	59	286	103	271	186	83	568	105	407
Arrive On Green	0.20	0.40	0.40	0.04	0.23	0.23	0.16	0.16	0.16	0.32	0.32	0.32
Sat Flow, veh/h	1541	1022	505	1654	1219	439	1697	1165	522	1753	324	1258
Grp Volume(v), veh/h	579	0	275	47	0	465	236	0	210	102	0	781
Grp Sat Flow(s),veh/h/ln	1541	0	1527	1654	0	1658	1697	0	1687	1753	0	1582
Q Serve(g_s), s	29.0	0.0	19.2	4.1	0.0	34.0	19.7	0.0	17.3	6.1	0.0	47.0
Cycle Q Clear(g_c), s	29.0	0.0	19.2	4.1	0.0	34.0	19.7	0.0	17.3	6.1	0.0	47.0
Prop In Lane	1.00		0.33	1.00		0.26	1.00		0.31	1.00		0.80
Lane Grp Cap(c), veh/h	308	0	608	59	0	388	271	0	269	568	0	512
V/C Ratio(X)	1.88	0.00	0.45	0.79	0.00	1.20	0.87	0.00	0.78	0.18	0.00	1.52
Avail Cap(c_a), veh/h	308	0	608	114	0	388	386	0	384	568	0	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.1	0.0	32.0	69.4	0.0	55.6	59.6	0.0	58.6	35.2	0.0	49.1
Incr Delay (d2), s/veh	408.2	0.0	0.5	20.7	0.0	111.2	14.3	0.0	6.5	0.1	0.0	245.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	46.0	0.0	7.1	2.1	0.0	26.0	9.4	0.0	7.8	2.6	0.0	53.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	466.2	0.0	32.6	90.1	0.0	166.8	73.8	0.0	65.0	35.4	0.0	294.9
LnGrp LOS	F	A	C	F	A	F	E	A	E	D	A	F
Approach Vol, veh/h		854			512			446			883	
Approach Delay, s/veh		326.6			159.7			69.7			264.9	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	50.0	32.0	37.0	26.1	8.2	60.8
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	47.0	29.0	34.0	33.0	10.0	53.0
Max Q Clear Time (g_c+I1), s	49.0	31.0	36.0	21.7	6.1	21.2
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	232.2
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	20	57	58	54	109
Future Vol, veh/h	37	20	57	58	54	109
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	45	24	69	70	65	131

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	221	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	114	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1423	-	-	-	769	950
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	913	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	740	947
Mov Cap-2 Maneuver	-	-	-	-	740	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	910	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	867
HCM Lane V/C Ratio	0.031	-	-	-	0.227
HCM Control Delay (s)	7.6	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	303	470	60	38	29
Future Vol, veh/h	48	303	470	60	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	50	316	490	63	40	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	490	0	-	0	906	490
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	416	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	977	-	-	0	309	582
Stage 1	-	-	-	0	620	-
Stage 2	-	-	-	0	670	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	977	-	-	-	293	582
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	670	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	977	-	-	517
HCM Lane V/C Ratio	0.051	-	-	0.135
HCM Control Delay (s)	8.9	-	-	13
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	0.5

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	11	363	1	9	171
Future Vol, veh/h	8	11	363	1	9	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	10	13	432	1	11	204

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	658	432	0	-	432	0
Stage 1	432	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	414	603	-	0	1112	-
Stage 1	634	-	-	0	-	-
Stage 2	788	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	410	603	-	-	1112	-
Mov Cap-2 Maneuver	410	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	503	1112	-
HCM Lane V/C Ratio	-	0.045	0.01	-
HCM Control Delay (s)	-	12.5	8.3	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	30	222	355	4
Future Vol, veh/h	1	0	30	222	355	4
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	33	241	386	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	695	388	390	0	-	0
Stage 1	388	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	408	660	1169	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	395	660	1169	-	-	-
Mov Cap-2 Maneuver	395	-	-	-	-	-
Stage 1	663	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1169	-	395	-	-
HCM Lane V/C Ratio	0.028	-	0.003	-	-
HCM Control Delay (s)	8.2	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	35	34	0	2	0	249	34	2	353	0
Future Vol, veh/h	1	0	35	34	0	2	0	249	34	2	353	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	38	37	0	2	0	271	37	2	384	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	679	696	384	697	678	290	384	0	0	308	0	0
Stage 1	388	388	-	290	290	-	-	-	-	-	-	-
Stage 2	291	308	-	407	388	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	366	365	664	356	374	749	1174	-	-	1253	-	-
Stage 1	636	609	-	718	672	-	-	-	-	-	-	-
Stage 2	717	660	-	621	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	365	364	664	335	373	749	1174	-	-	1253	-	-
Mov Cap-2 Maneuver	365	364	-	335	373	-	-	-	-	-	-	-
Stage 1	636	608	-	718	672	-	-	-	-	-	-	-
Stage 2	715	660	-	584	608	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	16.7	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1174	-	-	649	346	1253	-	-
HCM Lane V/C Ratio	-	-	-	0.06	0.113	0.002	-	-
HCM Control Delay (s)	0	-	-	10.9	16.7	7.9	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	47.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	320	26	257	320	26	396
Future Vol, veh/h	320	26	257	320	26	396
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	348	28	279	348	28	430

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	939	453	0	0	627	0
Stage 1	453	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 293	607	-	-	955	-
Stage 1	640	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 282	607	-	-	955	-
Mov Cap-2 Maneuver	~ 282	-	-	-	-	-
Stage 1	640	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	184.9	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	294	955	-
HCM Lane V/C Ratio	-	-	1.279	0.03	-
HCM Control Delay (s)	-	-	184.9	8.9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	18.1	0.1	-

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

Intersection	
Int Delay, s/veh	36.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	252	265	556	695	21
Future Vol, veh/h	21	252	265	556	695	21
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	274	288	604	755	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1947	767	778	0	-	0
Stage 1	767	-	-	-	-	-
Stage 2	1180	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	71	402	839	-	-	-
Stage 1	458	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	34	402	839	-	-	-
Mov Cap-2 Maneuver	34	-	-	-	-	-
Stage 1	221	-	-	-	-	-
Stage 2	292	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	229.4	3.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	839	-	219	-	-
HCM Lane V/C Ratio	0.343	-	1.355	-	-
HCM Control Delay (s)	11.5	0	229.4	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	1.5	-	16.5	-	-

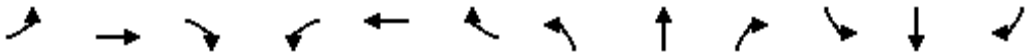
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	430	273	25
Future Vol, veh/h	12	1	1	430	273	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	1	1	467	297	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	780	311	324	0	-	0
Stage 1	311	-	-	-	-	-
Stage 2	469	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	364	729	1236	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	364	729	1236	-	-	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1236	-	379	-	-
HCM Lane V/C Ratio	0.001	-	0.037	-	-
HCM Control Delay (s)	7.9	-	14.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	482	15	44	187	74	8	56	36	126	62	14
Future Volume (veh/h)	52	482	15	44	187	74	8	56	36	126	62	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	56	518	15	47	201	71	9	60	39	135	67	6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	83	712	21	71	500	176	14	90	59	223	211	19
Arrive On Green	0.05	0.40	0.40	0.04	0.40	0.40	0.09	0.09	0.09	0.13	0.13	0.13
Sat Flow, veh/h	1739	1766	51	1697	1257	444	147	980	637	1753	1665	149
Grp Volume(v), veh/h	56	0	533	47	0	272	108	0	0	135	0	73
Grp Sat Flow(s),veh/h/ln	1739	0	1817	1697	0	1701	1763	0	0	1753	0	1814
Q Serve(g_s), s	1.1	0.0	8.9	1.0	0.0	4.1	2.1	0.0	0.0	2.6	0.0	1.3
Cycle Q Clear(g_c), s	1.1	0.0	8.9	1.0	0.0	4.1	2.1	0.0	0.0	2.6	0.0	1.3
Prop In Lane	1.00		0.03	1.00		0.26	0.08		0.36	1.00		0.08
Lane Grp Cap(c), veh/h	83	0	733	71	0	676	162	0	0	223	0	230
V/C Ratio(X)	0.67	0.00	0.73	0.66	0.00	0.40	0.67	0.00	0.00	0.61	0.00	0.32
Avail Cap(c_a), veh/h	535	0	3203	427	0	2905	1036	0	0	981	0	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	9.0	16.9	0.0	7.7	15.7	0.0	0.0	14.8	0.0	14.2
Incr Delay (d2), s/veh	9.1	0.0	1.4	10.2	0.0	0.4	4.6	0.0	0.0	2.7	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	2.2	0.5	0.0	0.9	0.9	0.0	0.0	0.9	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.9	0.0	10.4	27.0	0.0	8.1	20.3	0.0	0.0	17.4	0.0	15.0
LnGrp LOS	C	A	B	C	A	A	C	A	A	B	A	B
Approach Vol, veh/h		589			319			108			208	
Approach Delay, s/veh		11.9			10.9			20.3			16.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.3	4.7	17.2		7.5	4.5	17.4				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		21.0	11.0	61.0		20.0	9.0	63.0				
Max Q Clear Time (g_c+I1), s		4.1	3.1	6.1		4.6	3.0	10.9				
Green Ext Time (p_c), s		0.4	0.0	1.7		0.6	0.0	3.6				

Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									

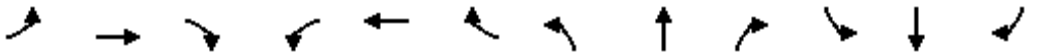
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	699	17	43	303	10	11	0	29	9	0	2
Future Vol, veh/h	1	699	17	43	303	10	11	0	29	9	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	1	760	18	47	329	11	12	0	32	10	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	329	0	0	760	0	0	1194	1194	769	1191	1191	335
Stage 1	-	-	-	-	-	-	771	771	-	429	429	-
Stage 2	-	-	-	-	-	-	423	423	-	762	762	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1219	-	-	817	-	-	161	184	396	159	182	691
Stage 1	-	-	-	-	-	-	388	405	-	591	572	-
Stage 2	-	-	-	-	-	-	603	583	-	387	403	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1219	-	-	817	-	-	152	171	396	138	169	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	152	171	-	138	169	-
Stage 1	-	-	-	-	-	-	388	405	-	590	531	-
Stage 2	-	-	-	-	-	-	558	542	-	356	403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	12.2	27.9
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	546	1219	-	-	817	-	-	169
HCM Lane V/C Ratio	0.08	0.001	-	-	0.057	-	-	0.071
HCM Control Delay (s)	12.2	8	0	-	9.7	0	-	27.9
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	312	425	402	275	0	0	0	0	372	2	81
Future Volume (veh/h)	0	312	425	402	275	0	0	0	0	372	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	339	422	437	299	0				404	2	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	307	383	358	1185	0				348	2	69
Arrive On Green	0.00	0.42	0.42	0.35	1.00	0.00				0.25	0.25	0.25
Sat Flow, veh/h	0	730	909	1682	1767	0				1371	7	271
Grp Volume(v), veh/h	0	0	761	437	299	0				486	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1639	1682	1767	0				1649	0	0
Q Serve(g_s), s	0.0	0.0	50.5	25.5	0.0	0.0				30.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	50.5	25.5	0.0	0.0				30.5	0.0	0.0
Prop In Lane	0.00		0.55	1.00		0.00				0.83		0.16
Lane Grp Cap(c), veh/h	0	0	690	358	1185	0				419	0	0
V/C Ratio(X)	0.00	0.00	1.10	1.22	0.25	0.00				1.16	0.00	0.00
Avail Cap(c_a), veh/h	0	0	690	358	1185	0				419	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	34.8	38.7	0.0	0.0				44.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	66.0	102.5	0.0	0.0				95.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	31.7	19.0	0.0	0.0				23.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	100.7	141.2	0.0	0.0				140.0	0.0	0.0
LnGrp LOS	A	A	F	F	A	A				F	A	A
Approach Vol, veh/h		761			736						486	
Approach Delay, s/veh		100.7			83.8						140.0	
Approach LOS		F			F						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		85.0		35.0	30.0	55.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		80.5		30.5	25.5	50.5						
Max Q Clear Time (g_c+I1), s		2.0		32.5	27.5	52.5						
Green Ext Time (p_c), s		1.8		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			104.1									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	635	0	0	558	355	119	0	456	0	0	0
Future Volume (veh/h)	49	635	0	0	558	355	119	0	456	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	52	668	0	0	587	355	125	0	364			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	66	1100	0	0	552	334	124	0	361			
Arrive On Green	0.01	0.20	0.00	0.00	0.54	0.54	0.31	0.00	0.31			
Sat Flow, veh/h	1711	1796	0	0	1030	623	397	0	1156			
Grp Volume(v), veh/h	52	668	0	0	0	942	489	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1653	1553	0	0			
Q Serve(g_s), s	3.6	40.6	0.0	0.0	0.0	64.4	37.5	0.0	0.0			
Cycle Q Clear(g_c), s	3.6	40.6	0.0	0.0	0.0	64.4	37.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.38	0.26		0.74			
Lane Grp Cap(c), veh/h	66	1100	0	0	0	887	485	0	0			
V/C Ratio(X)	0.79	0.61	0.00	0.00	0.00	1.06	1.01	0.00	0.00			
Avail Cap(c_a), veh/h	76	1100	0	0	0	887	485	0	0			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.00	0.53	1.00	0.00	0.00			
Uniform Delay (d), s/veh	58.7	34.7	0.0	0.0	0.0	27.8	41.3	0.0	0.0			
Incr Delay (d2), s/veh	4.4	0.2	0.0	0.0	0.0	40.7	42.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	19.4	0.0	0.0	0.0	33.2	19.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	35.0	0.0	0.0	0.0	68.6	83.9	0.0	0.0			
LnGrp LOS	E	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		720			942			489				
Approach Delay, s/veh		37.0			68.6			83.9				
Approach LOS		D			E			F				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	9.1	68.9		42.0		78.0			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.3	63.7		37.5		73.5			
Max Q Clear Time (g_c+I1), s	5.6	66.4		39.5		42.6			
Green Ext Time (p_c), s	0.0	0.0		0.0		4.8			

Intersection Summary	
HCM 6th Ctrl Delay	61.5
HCM 6th LOS	E

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	20	73	59	13	12	38	114	19	6	95	4
Future Vol, veh/h	2	20	73	59	13	12	38	114	19	6	95	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	2	21	77	62	14	13	40	120	20	6	100	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.5	8.8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	2%	70%	6%
Vol Thru, %	67%	21%	15%	90%
Vol Right, %	11%	77%	14%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	171	95	84	105
LT Vol	38	2	59	6
Through Vol	114	20	13	95
RT Vol	19	73	12	4
Lane Flow Rate	180	100	88	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.225	0.12	0.118	0.14
Departure Headway (Hd)	4.492	4.327	4.809	4.564
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	799	828	745	786
Service Time	2.519	2.357	2.84	2.593
HCM Lane V/C Ratio	0.225	0.121	0.118	0.141
HCM Control Delay	8.8	8	8.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.4	0.4	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	564	362	165	70	197	58	144	88	77	83	99	572
Future Volume (veh/h)	564	362	165	70	197	58	144	88	77	83	99	572
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	588	377	162	73	205	54	150	92	56	86	103	476
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	534	510	219	92	232	61	199	121	73	547	89	410
Arrive On Green	0.31	0.43	0.43	0.05	0.17	0.17	0.12	0.12	0.12	0.31	0.31	0.31
Sat Flow, veh/h	1711	1191	512	1711	1369	361	1725	1048	638	1753	284	1313
Grp Volume(v), veh/h	588	0	539	73	0	259	150	0	148	86	0	579
Grp Sat Flow(s),veh/h/ln	1711	0	1703	1711	0	1730	1725	0	1686	1753	0	1597
Q Serve(g_s), s	41.0	0.0	34.8	5.5	0.0	19.2	11.1	0.0	11.2	4.7	0.0	41.0
Cycle Q Clear(g_c), s	41.0	0.0	34.8	5.5	0.0	19.2	11.1	0.0	11.2	4.7	0.0	41.0
Prop In Lane	1.00		0.30	1.00		0.21	1.00		0.38	1.00		0.82
Lane Grp Cap(c), veh/h	534	0	729	92	0	293	199	0	194	547	0	498
V/C Ratio(X)	1.10	0.00	0.74	0.80	0.00	0.88	0.76	0.00	0.76	0.16	0.00	1.16
Avail Cap(c_a), veh/h	534	0	804	117	0	395	407	0	398	547	0	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	31.5	61.5	0.0	53.3	56.3	0.0	56.4	32.7	0.0	45.2
Incr Delay (d2), s/veh	69.6	0.0	3.3	24.8	0.0	16.5	5.7	0.0	6.1	0.1	0.0	93.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.2	0.0	14.5	3.0	0.0	9.6	5.1	0.0	5.0	2.0	0.0	28.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.7	0.0	34.8	86.3	0.0	69.8	62.1	0.0	62.4	32.8	0.0	138.2
LnGrp LOS	F	A	C	F	A	E	E	A	E	C	A	F
Approach Vol, veh/h		1127			332			298			665	
Approach Delay, s/veh		76.5			73.4			62.2			124.6	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	44.0	44.0	25.2	18.1	10.0	59.2
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	41.0	41.0	30.0	31.0	9.0	62.0
Max Q Clear Time (g_c+I1), s	43.0	43.0	21.2	13.2	7.5	36.8
Green Ext Time (p_c), s	0.0	0.0	0.9	1.1	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	87.5
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	17	32	73	42	50
Future Vol, veh/h	28	17	32	73	42	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	33	20	37	85	49	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	166	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1478	-	-	-	827	983
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	808	983
Mov Cap-2 Maneuver	-	-	-	-	808	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	895
HCM Lane V/C Ratio	0.022	-	-	-	0.12
HCM Control Delay (s)	7.5	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	469	287	49	36	38
Future Vol, veh/h	53	469	287	49	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	56	499	305	52	38	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	305	0	-	0	916	305
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	611	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1222	-	-	0	304	737
Stage 1	-	-	-	0	750	-
Stage 2	-	-	-	0	544	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1222	-	-	-	290	737
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	544	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1222	-	-	596
HCM Lane V/C Ratio	0.046	-	-	0.132
HCM Control Delay (s)	8.1	-	-	12
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	181	5	7	280
Future Vol, veh/h	1	2	181	5	7	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	1	2	215	6	8	333

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	564	215	0	-	215	0
Stage 1	215	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	490	830	-	0	1355	-
Stage 1	826	-	-	0	-	-
Stage 2	719	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	487	830	-	-	1355	-
Mov Cap-2 Maneuver	487	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	719	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	672	1355	-
HCM Lane V/C Ratio	-	0.005	0.006	-
HCM Control Delay (s)	-	10.4	7.7	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	26	171	226	1
Future Vol, veh/h	1	0	26	171	226	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	28	186	246	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	489	247	247	0	-	0
Stage 1	247	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	538	792	1319	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	525	792	1319	-	-	-
Mov Cap-2 Maneuver	525	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1319	-	525	-	-
HCM Lane V/C Ratio	0.021	-	0.002	-	-
HCM Control Delay (s)	7.8	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	31	40	0	1	0	195	42	1	225	0
Future Vol, veh/h	1	0	31	40	0	1	0	195	42	1	225	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	34	43	0	1	0	212	46	1	245	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	483	505	245	499	482	235	245	0	0	258	0	0
Stage 1	247	247	-	235	235	-	-	-	-	-	-	-
Stage 2	236	258	-	264	247	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	494	470	794	482	484	804	1321	-	-	1307	-	-
Stage 1	757	702	-	768	710	-	-	-	-	-	-	-
Stage 2	767	694	-	741	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	493	470	794	461	484	804	1321	-	-	1307	-	-
Mov Cap-2 Maneuver	493	470	-	461	484	-	-	-	-	-	-	-
Stage 1	757	701	-	768	710	-	-	-	-	-	-	-
Stage 2	766	694	-	709	701	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	13.5	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1321	-	-	779	466	1307	-	-
HCM Lane V/C Ratio	-	-	-	0.045	0.096	0.001	-	-
HCM Control Delay (s)	0	-	-	9.8	13.5	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Intersection	
Int Delay, s/veh	9.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	256	12	225	260	12	284
Future Vol, veh/h	256	12	225	260	12	284
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	278	13	245	283	13	309

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	722	387	0	0	528	0
Stage 1	387	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	394	661	-	-	1039	-
Stage 1	686	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	388	661	-	-	1039	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.8	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	395	1039	-
HCM Lane V/C Ratio	-	-	0.737	0.013	-
HCM Control Delay (s)	-	-	35.8	8.5	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	5.8	0	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	222	233	477	532	8
Future Vol, veh/h	8	222	233	477	532	8
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	241	253	518	578	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1607	583	587	0	-	0
Stage 1	583	-	-	-	-	-
Stage 2	1024	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	116	512	988	-	-	-
Stage 1	558	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	74	512	988	-	-	-
Mov Cap-2 Maneuver	74	-	-	-	-	-
Stage 1	357	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.9	3.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	988	-	425	-	-
HCM Lane V/C Ratio	0.256	-	0.588	-	-
HCM Control Delay (s)	9.9	0	24.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	1	-	3.7	-	-

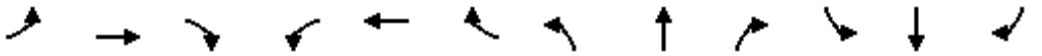
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	2	1	277	323	11
Future Vol, veh/h	31	2	1	277	323	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	1	301	351	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	660	357	363	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	303	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	428	687	1196	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	428	687	1196	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

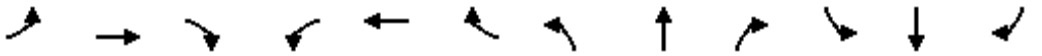
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1196	-	438	-	-
HCM Lane V/C Ratio	0.001	-	0.082	-	-
HCM Control Delay (s)	8	-	14	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	217	193	431	454	0	0	0	0	298	0	52
Future Volume (veh/h)	0	217	193	431	454	0	0	0	0	298	0	52
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1574	1574	1574
Adj Flow Rate, veh/h	0	236	53	468	493	0				324	0	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				22	22	22
Cap, veh/h	0	463	392	491	1114	0				361	0	321
Arrive On Green	0.00	0.29	0.29	0.60	1.00	0.00				0.24	0.00	0.24
Sat Flow, veh/h	0	1589	1346	1640	1722	0				1499	0	1334
Grp Volume(v), veh/h	0	236	53	468	493	0				324	0	14
Grp Sat Flow(s),veh/h/ln	0	1589	1346	1640	1722	0				1499	0	1334
Q Serve(g_s), s	0.0	9.9	2.3	21.3	0.0	0.0				16.8	0.0	0.6
Cycle Q Clear(g_c), s	0.0	9.9	2.3	21.3	0.0	0.0				16.8	0.0	0.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	463	392	491	1114	0				361	0	321
V/C Ratio(X)	0.00	0.51	0.14	0.95	0.44	0.00				0.90	0.00	0.04
Avail Cap(c_a), veh/h	0	463	392	564	1114	0				403	0	358
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.68	0.68	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.6	20.9	15.5	0.0	0.0				29.4	0.0	23.3
Incr Delay (d2), s/veh	0.0	4.0	0.7	19.3	0.9	0.0				21.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.0	0.8	6.5	0.3	0.0				7.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	27.6	21.6	34.8	0.9	0.0				50.4	0.0	23.4
LnGrp LOS	A	C	C	C	A	A				D	A	C
Approach Vol, veh/h		289			961						338	
Approach Delay, s/veh		26.5			17.4						49.3	
Approach LOS		C			B						D	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		56.3		23.7	28.5	27.8						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		49.5		21.5	27.5	17.5						
Max Q Clear Time (g_c+I1), s		2.0		18.8	23.3	11.9						
Green Ext Time (p_c), s		3.3		0.5	0.7	0.7						

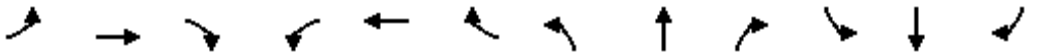
Intersection Summary												
HCM 6th Ctrl Delay			25.8									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	463	0	0	737	513	148	0	369	0	0	0
Future Volume (veh/h)	52	463	0	0	737	513	148	0	369	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1633	1633	1633			
Adj Flow Rate, veh/h	54	482	0	0	768	336	154	0	61			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	18	18	18			
Cap, veh/h	65	1199	0	0	1169	991	195	0	174			
Arrive On Green	0.09	1.00	0.00	0.00	0.66	0.66	0.13	0.00	0.13			
Sat Flow, veh/h	1499	1574	0	0	1767	1497	1555	0	1384			
Grp Volume(v), veh/h	54	482	0	0	768	336	154	0	61			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	1767	1497	1555	0	1384			
Q Serve(g_s), s	2.8	0.0	0.0	0.0	20.8	7.8	7.7	0.0	3.2			
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.0	20.8	7.8	7.7	0.0	3.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	65	1199	0	0	1169	991	195	0	174			
V/C Ratio(X)	0.82	0.40	0.00	0.00	0.66	0.34	0.79	0.00	0.35			
Avail Cap(c_a), veh/h	103	1199	0	0	1169	991	301	0	268			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.2	0.0	0.0	0.0	8.1	5.9	33.9	0.0	32.0			
Incr Delay (d2), s/veh	20.4	0.8	0.0	0.0	2.1	0.7	7.4	0.0	1.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.3	0.3	0.0	0.0	6.4	2.0	3.1	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	0.8	0.0	0.0	10.2	6.6	41.4	0.0	33.2			
LnGrp LOS	E	A	A	A	B	A	D	A	C			
Approach Vol, veh/h		536			1104			215				
Approach Delay, s/veh		6.4			9.1			39.0				
Approach LOS		A			A			D				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	8.0	57.5		14.6		65.4			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.5	45.5		15.5		55.5			
Max Q Clear Time (g_c+I1), s	4.8	22.8		9.7		2.0			
Green Ext Time (p_c), s	0.0	6.8		0.5		3.3			

Intersection Summary			
HCM 6th Ctrl Delay		11.8	
HCM 6th LOS		B	



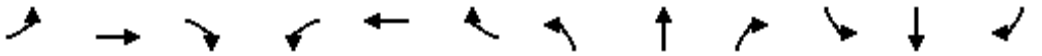
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	556	177	99	45	328	126	227	139	76	98	154	695
Future Volume (veh/h)	556	177	99	45	328	126	227	139	76	98	154	695
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	579	184	91	47	342	122	236	145	63	102	160	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	683	523	258	57	388	138	305	211	92	214	224	
Arrive On Green	0.23	0.51	0.51	0.03	0.32	0.32	0.18	0.18	0.18	0.12	0.12	0.00
Sat Flow, veh/h	2990	1022	505	1654	1222	436	1697	1178	512	1753	1841	1560
Grp Volume(v), veh/h	579	0	275	47	0	464	236	0	208	102	160	0
Grp Sat Flow(s),veh/h/ln	1495	0	1527	1654	0	1658	1697	0	1689	1753	1841	1560
Q Serve(g_s), s	14.6	0.0	8.4	2.2	0.0	20.8	10.4	0.0	9.1	4.3	6.6	0.0
Cycle Q Clear(g_c), s	14.6	0.0	8.4	2.2	0.0	20.8	10.4	0.0	9.1	4.3	6.6	0.0
Prop In Lane	1.00		0.33	1.00		0.26	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	683	0	781	57	0	527	305	0	303	214	224	
V/C Ratio(X)	0.85	0.00	0.35	0.82	0.00	0.88	0.77	0.00	0.69	0.48	0.71	
Avail Cap(c_a), veh/h	913	0	952	189	0	717	648	0	645	669	703	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.0	0.0	11.4	37.7	0.0	25.4	30.7	0.0	30.2	32.2	33.2	0.0
Incr Delay (d2), s/veh	5.8	0.0	0.3	23.9	0.0	9.6	4.2	0.0	2.7	1.7	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	2.5	1.2	0.0	8.8	4.3	0.0	3.7	1.8	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	11.7	61.6	0.0	35.0	35.0	0.0	32.9	33.8	37.4	0.0
LnGrp LOS	C	A	B	E	A	C	C	A	C	C	D	
Approach Vol, veh/h		854			511			444			262	A
Approach Delay, s/veh		27.4			37.4			34.0			36.0	
Approach LOS		C			D			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.6	21.0	28.0		17.1	5.7	43.2				
Change Period (Y+Rc), s		3.0	3.0	3.0		3.0	3.0	3.0				
Max Green Setting (Gmax), s		30.0	24.0	34.0		30.0	9.0	49.0				
Max Q Clear Time (g_c+I1), s		8.6	16.6	22.8		12.4	4.2	10.4				
Green Ext Time (p_c), s		1.0	1.4	2.1		1.7	0.0	1.7				

Intersection Summary	
HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	312	425	402	275	0	0	0	0	372	2	81
Future Volume (veh/h)	0	312	425	402	275	0	0	0	0	372	2	81
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1767	1767	1767
Adj Flow Rate, veh/h	0	339	124	437	299	0				404	2	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				9	9	9
Cap, veh/h	0	529	439	466	1101	0				443	2	396
Arrive On Green	0.00	0.29	0.29	0.46	1.00	0.00				0.26	0.26	0.26
Sat Flow, veh/h	0	1826	1514	1682	1767	0				1675	8	1497
Grp Volume(v), veh/h	0	339	124	437	299	0				406	0	24
Grp Sat Flow(s),veh/h/ln	0	1826	1514	1682	1767	0				1683	0	1497
Q Serve(g_s), s	0.0	13.0	5.1	19.7	0.0	0.0				18.7	0.0	1.0
Cycle Q Clear(g_c), s	0.0	13.0	5.1	19.7	0.0	0.0				18.7	0.0	1.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	529	439	466	1101	0				445	0	396
V/C Ratio(X)	0.00	0.64	0.28	0.94	0.27	0.00				0.91	0.00	0.06
Avail Cap(c_a), veh/h	0	529	439	515	1101	0				473	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.8	22.0	20.8	0.0	0.0				28.5	0.0	22.0
Incr Delay (d2), s/veh	0.0	5.9	1.6	20.1	0.5	0.0				21.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.0	1.9	7.7	0.1	0.0				9.6	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.6	23.6	41.0	0.5	0.0				49.7	0.0	22.1
LnGrp LOS	A	C	C	D	A	A				D	A	C
Approach Vol, veh/h		463			736						430	
Approach Delay, s/veh		28.7			24.5						48.2	
Approach LOS		C			C						D	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		54.3		25.7	26.7	27.7						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		48.5		22.5	24.5	19.5						
Max Q Clear Time (g_c+I1), s		2.0		20.7	21.7	15.0						
Green Ext Time (p_c), s		1.8		0.5	0.4	1.0						

Intersection Summary												
HCM 6th Ctrl Delay			32.0									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	635	0	0	558	355	119	0	456	0	0	0
Future Volume (veh/h)	49	635	0	0	558	355	119	0	456	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1781	1781	1781			
Adj Flow Rate, veh/h	52	668	0	0	587	206	125	0	295			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	8	8	8			
Cap, veh/h	73	1188	0	0	994	841	383	0	341			
Arrive On Green	0.09	1.00	0.00	0.00	0.56	0.56	0.23	0.00	0.23			
Sat Flow, veh/h	1711	1796	0	0	1767	1494	1697	0	1510			
Grp Volume(v), veh/h	52	668	0	0	587	206	125	0	295			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	1767	1494	1697	0	1510			
Q Serve(g_s), s	2.4	0.0	0.0	0.0	17.4	5.6	4.9	0.0	15.0			
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.0	17.4	5.6	4.9	0.0	15.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	73	1188	0	0	994	841	383	0	341			
V/C Ratio(X)	0.71	0.56	0.00	0.00	0.59	0.25	0.33	0.00	0.86			
Avail Cap(c_a), veh/h	118	1188	0	0	994	841	520	0	462			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.65	0.65	0.00	0.00	0.64	0.64	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.1	0.0	0.0	0.0	11.5	8.9	25.9	0.0	29.8			
Incr Delay (d2), s/veh	8.0	1.3	0.0	0.0	1.7	0.4	0.5	0.0	12.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	0.4	0.0	0.0	6.1	1.6	1.9	0.0	6.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	1.3	0.0	0.0	13.1	9.3	26.4	0.0	42.0			
LnGrp LOS	D	A	A	A	B	A	C	A	D			
Approach Vol, veh/h		720			793			420				
Approach Delay, s/veh		4.3			12.1			37.3				
Approach LOS		A			B			D				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	7.9	49.5		22.6		57.4			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.5	36.5		24.5		46.5			
Max Q Clear Time (g_c+I1), s	4.4	19.4		17.0		2.0			
Green Ext Time (p_c), s	0.0	4.1		1.0		5.0			

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B



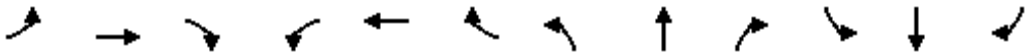
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	564	362	165	70	197	58	144	88	77	83	99	572
Future Volume (veh/h)	564	362	165	70	197	58	144	88	77	83	99	572
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	588	377	161	73	205	54	150	92	59	86	103	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	841	488	208	91	285	75	276	164	105	199	209	
Arrive On Green	0.25	0.41	0.41	0.05	0.21	0.21	0.16	0.16	0.16	0.11	0.11	0.00
Sat Flow, veh/h	3319	1194	510	1711	1370	361	1725	1027	658	1753	1841	1560
Grp Volume(v), veh/h	588	0	538	73	0	259	150	0	151	86	103	0
Grp Sat Flow(s),veh/h/ln	1659	0	1704	1711	0	1731	1725	0	1685	1753	1841	1560
Q Serve(g_s), s	7.3	0.0	12.4	1.9	0.0	6.3	3.6	0.0	3.7	2.1	2.4	0.0
Cycle Q Clear(g_c), s	7.3	0.0	12.4	1.9	0.0	6.3	3.6	0.0	3.7	2.1	2.4	0.0
Prop In Lane	1.00		0.30	1.00		0.21	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	841	0	696	91	0	360	276	0	270	199	209	
V/C Ratio(X)	0.70	0.00	0.77	0.80	0.00	0.72	0.54	0.00	0.56	0.43	0.49	
Avail Cap(c_a), veh/h	3002	0	2331	340	0	1146	1180	0	1153	1586	1665	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.4	0.0	11.6	21.2	0.0	16.7	17.5	0.0	17.6	18.7	18.9	0.0
Incr Delay (d2), s/veh	1.1	0.0	1.9	15.0	0.0	2.7	1.7	0.0	1.8	1.5	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	3.6	1.0	0.0	2.3	1.3	0.0	1.3	0.8	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	0.0	13.5	36.3	0.0	19.4	19.2	0.0	19.4	20.2	20.6	0.0
LnGrp LOS	B	A	B	D	A	B	B	A	B	C	C	
Approach Vol, veh/h		1126			332			301			189	A
Approach Delay, s/veh		15.0			23.1			19.3			20.4	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	8.2	14.5	12.4	10.3	5.4	21.5
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	41.0	41.0	30.0	31.0	9.0	62.0
Max Q Clear Time (g_c+I1), s	4.4	9.3	8.3	5.7	3.9	14.4
Green Ext Time (p_c), s	0.8	2.2	1.4	1.2	0.1	3.8

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	390	10	60	590	100	20	100	50	160	50	100
Future Volume (vph)	70	390	10	60	590	100	20	100	50	160	50	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.96		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1517	1591		1626	1674			1649		1703	1613	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1517	1591		1626	1674			1649		1703	1613	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	424	11	65	641	109	22	109	54	174	54	109
RTOR Reduction (vph)	0	1	0	0	5	0	0	0	0	0	58	0
Lane Group Flow (vph)	76	434	0	65	745	0	0	185	0	174	105	0
Heavy Vehicles (%)	19%	19%	19%	11%	11%	11%	10%	10%	10%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												
Actuated Green, G (s)	7.2	53.2		7.5	53.5			16.6		15.4	15.4	
Effective Green, g (s)	6.2	52.2		6.5	52.5			15.6		14.4	14.4	
Actuated g/C Ratio	0.06	0.50		0.06	0.50			0.15		0.14	0.14	
Clearance Time (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	89	793		100	839			245		234	221	
v/s Ratio Prot	c0.05	0.27		0.04	c0.44			c0.11		c0.10	0.07	
v/s Ratio Perm												
v/c Ratio	0.85	0.55		0.65	0.89			0.76		0.74	0.48	
Uniform Delay, d1	48.8	18.1		48.0	23.5			42.7		43.4	41.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	50.7	0.8		14.1	11.2			12.4		12.0	1.6	
Delay (s)	99.5	18.9		62.1	34.7			55.1		55.4	43.3	
Level of Service	F	B		E	C			E		E	D	
Approach Delay (s)		30.9			36.9			55.1			49.5	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	14.3

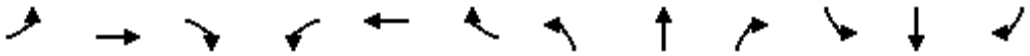
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	620	10	40	790	10	50	0	40	10	10	0
Future Vol, veh/h	0	620	10	40	790	10	50	0	40	10	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	713	11	46	908	11	57	0	46	11	11	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	908	0	0	713	0	0	1725	1719	719	1719	1719	914
Stage 1	-	-	-	-	-	-	719	719	-	1006	1006	-
Stage 2	-	-	-	-	-	-	1006	1000	-	713	713	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	677	-	-	843	-	-	70	90	428	49	63	254
Stage 1	-	-	-	-	-	-	420	433	-	222	248	-
Stage 2	-	-	-	-	-	-	291	321	-	335	351	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	677	-	-	843	-	-	~ 54	80	428	40	56	254
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 54	80	-	40	56	-
Stage 1	-	-	-	-	-	-	420	433	-	222	220	-
Stage 2	-	-	-	-	-	-	245	285	-	299	351	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	215.6	140.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	92	677	-	-	843	-	-	47
HCM Lane V/C Ratio	1.124	-	-	-	0.055	-	-	0.489
HCM Control Delay (s)	215.6	0	-	-	9.5	0	-	140.1
HCM Lane LOS	F	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	7	0	-	-	0.2	-	-	1.8

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	330	340	420	750	0	0	0	0	160	0	90
Future Volume (veh/h)	0	330	340	420	750	0	0	0	0	160	0	90
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	359	338	457	815	0				174	0	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	351	331	451	1335	0				179	0	52
Arrive On Green	0.00	0.47	0.46	0.18	0.52	0.00				0.16	0.00	0.15
Sat Flow, veh/h	0	753	709	1640	1722	0				1128	0	331
Grp Volume(v), veh/h	0	0	697	457	815	0				225	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1461	1640	1722	0				1458	0	0
Q Serve(g_s), s	0.0	0.0	56.0	33.0	40.0	0.0				18.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	56.0	33.0	40.0	0.0				18.4	0.0	0.0
Prop In Lane	0.00		0.48	1.00		0.00				0.77		0.23
Lane Grp Cap(c), veh/h	0	0	682	451	1335	0				231	0	0
V/C Ratio(X)	0.00	0.00	1.02	1.01	0.61	0.00				0.97	0.00	0.00
Avail Cap(c_a), veh/h	0	0	682	451	1335	0				231	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	32.1	48.9	16.1	0.0				50.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	40.2	16.1	0.2	0.0				51.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	26.1	15.8	16.5	0.0				9.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	72.3	65.1	16.3	0.0				102.2	0.0	0.0
LnGrp LOS	A	A	F	F	B	A				F	A	A
Approach Vol, veh/h		697			1272						225	
Approach Delay, s/veh		72.3			33.8						102.2	
Approach LOS		E			C						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		97.0		23.0	37.0	60.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		92.5		18.5	32.5	55.5						
Max Q Clear Time (g_c+I1), s		42.0		20.4	35.0	58.0						
Green Ext Time (p_c), s		7.0		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			53.0									
HCM 6th LOS			D									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	400	0	0	910	550	260	0	300	0	0	0
Future Volume (veh/h)	90	400	0	0	910	550	260	0	300	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	94	417	0	0	948	555	271	0	270			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	87	1089	0	0	627	367	177	0	177			
Arrive On Green	0.12	1.00	0.00	0.00	0.60	0.60	0.24	0.00	0.24			
Sat Flow, veh/h	1499	1574	0	0	1045	612	734	0	731			
Grp Volume(v), veh/h	94	417	0	0	0	1503	541	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1657	1465	0	0			
Q Serve(g_s), s	7.0	0.0	0.0	0.0	0.0	72.0	29.0	0.0	0.0			
Cycle Q Clear(g_c), s	7.0	0.0	0.0	0.0	0.0	72.0	29.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.37	0.50		0.50			
Lane Grp Cap(c), veh/h	87	1089	0	0	0	994	354	0	0			
V/C Ratio(X)	1.07	0.38	0.00	0.00	0.00	1.51	1.53	0.00	0.00			
Avail Cap(c_a), veh/h	87	1089	0	0	0	994	354	0	0			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.00	0.09	1.00	0.00	0.00			
Uniform Delay (d), s/veh	53.0	0.0	0.0	0.0	0.0	24.1	45.6	0.0	0.0			
Incr Delay (d2), s/veh	51.2	0.1	0.0	0.0	0.0	231.0	251.6	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	0.0	0.0	88.7	35.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.2	0.1	0.0	0.0	0.0	255.1	297.2	0.0	0.0			
LnGrp LOS	F	A	A	A	A	F	F	A	A			
Approach Vol, veh/h		511			1503			541				
Approach Delay, s/veh		19.3			255.1			297.2				
Approach LOS		B			F			F				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.0	76.0		33.0		87.0						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	6.5	71.5		28.5		82.5						
Max Q Clear Time (g_c+I1), s	9.0	74.0		31.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		2.7						

Intersection Summary		
HCM 6th Ctrl Delay	216.8	
HCM 6th LOS	F	

Intersection	
Intersection Delay, s/veh	36.5
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	30	130	170	60	50	150	180	50	40	310	20
Future Vol, veh/h	10	30	130	170	60	50	150	180	50	40	310	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	11	34	149	195	69	57	172	207	57	46	356	23
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.4	27.3	46.4	42
HCM LOS	C	D	E	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	39%	6%	61%	11%
Vol Thru, %	47%	18%	21%	84%
Vol Right, %	13%	76%	18%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	380	170	280	370
LT Vol	150	10	170	40
Through Vol	180	30	60	310
RT Vol	50	130	50	20
Lane Flow Rate	437	195	322	425
Geometry Grp	1	1	1	1
Degree of Util (X)	0.895	0.439	0.7	0.867
Departure Headway (Hd)	7.376	8.096	7.835	7.339
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	489	444	460	493
Service Time	5.434	6.171	5.897	5.398
HCM Lane V/C Ratio	0.894	0.439	0.7	0.862
HCM Control Delay	46.4	17.4	27.3	42
HCM Lane LOS	E	C	D	E
HCM 95th-tile Q	10	2.2	5.3	9.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	420	140	70	740	10	380	230	130	10	260	340
Future Volume (veh/h)	140	420	140	70	740	10	380	230	130	10	260	340
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	146	438	139	73	771	10	396	240	125	10	271	324
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	103	416	132	77	570	7	351	228	119	503	216	258
Arrive On Green	0.07	0.35	0.36	0.05	0.33	0.34	0.21	0.21	0.21	0.29	0.29	0.29
Sat Flow, veh/h	1541	1177	374	1654	1711	22	1697	1103	575	1753	754	901
Grp Volume(v), veh/h	146	0	577	73	0	781	396	0	365	10	0	595
Grp Sat Flow(s),veh/h/ln	1541	0	1551	1654	0	1733	1697	0	1678	1753	0	1655
Q Serve(g_s), s	10.0	0.0	53.0	6.6	0.0	50.0	31.0	0.0	31.0	0.6	0.0	43.0
Cycle Q Clear(g_c), s	10.0	0.0	53.0	6.6	0.0	50.0	31.0	0.0	31.0	0.6	0.0	43.0
Prop In Lane	1.00		0.24	1.00		0.01	1.00		0.34	1.00		0.54
Lane Grp Cap(c), veh/h	103	0	548	77	0	578	351	0	347	503	0	475
V/C Ratio(X)	1.42	0.00	1.05	0.95	0.00	1.35	1.13	0.00	1.05	0.02	0.00	1.25
Avail Cap(c_a), veh/h	103	0	548	77	0	578	351	0	347	503	0	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	70.0	0.0	48.4	71.3	0.0	50.0	59.5	0.0	59.3	38.4	0.0	53.2
Incr Delay (d2), s/veh	236.7	0.0	53.1	83.8	0.0	169.6	87.9	0.0	62.8	0.0	0.0	130.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	28.0	4.6	0.0	48.4	21.7	0.0	19.0	0.3	0.0	34.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	306.7	0.0	101.4	155.1	0.0	219.6	147.4	0.0	122.1	38.4	0.0	183.8
LnGrp LOS	F	A	F	F	A	F	F	A	F	D	A	F
Approach Vol, veh/h		723			854			761			605	
Approach Delay, s/veh		142.9			214.1			135.3			181.4	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	47.0	14.0	54.0	35.0	11.0	57.0
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	44.0	11.0	51.0	32.0	8.0	54.0
Max Q Clear Time (g_c+I1), s	45.0	12.0	52.0	33.0	8.6	55.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	169.5
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	40	100	100	90	190
Future Vol, veh/h	60	40	100	100	90	190
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	72	48	120	120	108	229

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	243	0	-	0	375	183
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	192	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1306	-	-	-	628	862
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	588	860
Mov Cap-2 Maneuver	-	-	-	-	588	-
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	840	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1302	-	-	-	749
HCM Lane V/C Ratio	0.056	-	-	-	0.45
HCM Control Delay (s)	7.9	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	480	770	110	70	50
Future Vol, veh/h	80	480	770	110	70	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	83	500	802	115	73	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	802	0	-	0	1468	802
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	666	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	740	-	-	0	142	387
Stage 1	-	-	-	0	445	-
Stage 2	-	-	-	0	515	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	740	-	-	-	126	387
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	395	-
Stage 2	-	-	-	-	515	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	42.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	740	-	-	216
HCM Lane V/C Ratio	0.113	-	-	0.579
HCM Control Delay (s)	10.5	-	-	42.3
HCM Lane LOS	B	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	3.2

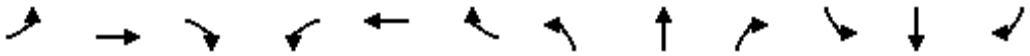
Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	20	620	10	10	290
Future Vol, veh/h	10	20	620	10	10	290
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	12	24	738	12	12	345

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1107	738	0	-	738	0
Stage 1	738	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	222	402	-	0	855	-
Stage 1	455	-	-	0	-	-
Stage 2	678	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	219	402	-	-	855	-
Mov Cap-2 Maneuver	219	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	314	855	-
HCM Lane V/C Ratio	-	0.114	0.014	-
HCM Control Delay (s)	-	17.9	9.3	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	0.4	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	820	30	70	300	130	10	100	60	220	110	20
Future Volume (vph)	90	820	30	70	300	130	10	100	60	220	110	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.95			0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1719	1800		1671	1679			1786		1736	1784	
Flt Permitted	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (perm)	1719	1800		1671	1679			1786		1736	1784	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	97	882	32	75	323	140	11	108	65	237	118	22
RTOR Reduction (vph)	0	1	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	97	913	0	75	450	0	0	184	0	237	135	0
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	1%	1%	1%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												
Actuated Green, G (s)	10.9	62.1		7.1	58.3			14.4		18.6	18.6	
Effective Green, g (s)	10.9	62.1		7.1	58.3			14.4		18.6	18.6	
Actuated g/C Ratio	0.10	0.54		0.06	0.51			0.13		0.16	0.16	
Clearance Time (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	164	978		103	857			225		282	290	
v/s Ratio Prot	c0.06	c0.51		c0.04	0.27			c0.10		c0.14	0.08	
v/s Ratio Perm												
v/c Ratio	0.59	0.93		0.73	0.53			0.82		0.84	0.47	
Uniform Delay, d1	49.5	24.1		52.6	18.7			48.6		46.4	43.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	5.6	15.2		22.5	0.6			20.1		19.6	1.2	
Delay (s)	55.1	39.4		75.1	19.3			68.7		66.0	44.5	
Level of Service	E	D		E	B			E		E	D	
Approach Delay (s)		40.9			27.1			68.7			58.0	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	114.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	9

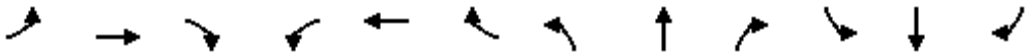
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	1190	30	80	490	20	20	0	50	20	0	10
Future Vol, veh/h	10	1190	30	80	490	20	20	0	50	20	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	11	1293	33	87	533	22	22	0	54	22	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	533	0	0	1293	0	0	2039	2039	1310	2033	2033	544
Stage 1	-	-	-	-	-	-	1332	1332	-	718	718	-
Stage 2	-	-	-	-	-	-	707	707	-	1315	1315	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1025	-	-	510	-	-	41	56	191	40	55	526
Stage 1	-	-	-	-	-	-	187	220	-	409	423	-
Stage 2	-	-	-	-	-	-	421	434	-	188	220	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1025	-	-	510	-	-	32	40	191	22	40	526
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	40	-	22	40	-
Stage 1	-	-	-	-	-	-	179	211	-	392	319	-
Stage 2	-	-	-	-	-	-	310	327	-	129	211	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.8	87.6	$ 331.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	112	1025	-	-	510	-	-	33
HCM Lane V/C Ratio	0.679	0.011	-	-	0.171	-	-	0.988
HCM Control Delay (s)	87.6	8.6	0	-	13.5	0	-	$ 331.7
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	3.5	0	-	-	0.6	-	-	3.5

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	520	740	340	450	0	0	0	0	280	0	140
Future Volume (veh/h)	0	520	740	340	450	0	0	0	0	280	0	140
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	565	762	370	489	0				304	0	106
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	396	535	275	1349	0				214	0	74
Arrive On Green	0.00	0.57	0.57	0.16	0.76	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	696	938	1682	1767	0				1209	0	421
Grp Volume(v), veh/h	0	0	1327	370	489	0				410	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1634	1682	1767	0				1630	0	0
Q Serve(g_s), s	0.0	0.0	85.5	24.5	13.6	0.0				26.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	85.5	24.5	13.6	0.0				26.5	0.0	0.0
Prop In Lane	0.00		0.57	1.00		0.00				0.74		0.26
Lane Grp Cap(c), veh/h	0	0	931	275	1349	0				288	0	0
V/C Ratio(X)	0.00	0.00	1.43	1.35	0.36	0.00				1.42	0.00	0.00
Avail Cap(c_a), veh/h	0	0	931	275	1349	0				288	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	32.3	62.7	5.8	0.0				61.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	197.5	158.1	0.1	0.0				209.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	82.7	22.4	4.4	0.0				27.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	229.8	220.9	5.9	0.0				271.4	0.0	0.0
LnGrp LOS	A	A	F	F	A	A				F	A	A
Approach Vol, veh/h		1327			859						410	
Approach Delay, s/veh		229.8			98.5						271.4	
Approach LOS		F			F						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		119.0		31.0	29.0	90.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		114.5		26.5	24.5	85.5						
Max Q Clear Time (g_c+I1), s		15.6		28.5	26.5	87.5						
Green Ext Time (p_c), s		3.3		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			192.9									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	710	0	0	580	250	210	0	430	0	0	0
Future Volume (veh/h)	90	710	0	0	580	250	210	0	430	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	95	747	0	0	611	250	221	0	391			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	107	1025	0	0	561	229	201	0	356			
Arrive On Green	0.06	0.57	0.00	0.00	0.47	0.47	0.35	0.00	0.35			
Sat Flow, veh/h	1711	1796	0	0	1191	487	568	0	1004			
Grp Volume(v), veh/h	95	747	0	0	0	861	612	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1678	1572	0	0			
Q Serve(g_s), s	6.6	36.7	0.0	0.0	0.0	56.5	42.5	0.0	0.0			
Cycle Q Clear(g_c), s	6.6	36.7	0.0	0.0	0.0	56.5	42.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.29	0.36		0.64			
Lane Grp Cap(c), veh/h	107	1025	0	0	0	790	557	0	0			
V/C Ratio(X)	0.89	0.73	0.00	0.00	0.00	1.09	1.10	0.00	0.00			
Avail Cap(c_a), veh/h	107	1025	0	0	0	790	557	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.00	0.72	1.00	0.00	0.00			
Uniform Delay (d), s/veh	55.8	18.9	0.0	0.0	0.0	31.8	38.8	0.0	0.0			
Incr Delay (d2), s/veh	8.5	0.4	0.0	0.0	0.0	55.1	68.1	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.1	14.1	0.0	0.0	0.0	33.4	26.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.4	19.3	0.0	0.0	0.0	86.8	106.8	0.0	0.0			
LnGrp LOS	E	B	A	A	A	F	F	A	A			
Approach Vol, veh/h		842			861			612				
Approach Delay, s/veh		24.4			86.8			106.8				
Approach LOS		C			F			F				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	12.0	61.0		47.0		73.0						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	7.5	56.5		42.5		68.5						
Max Q Clear Time (g_c+I1), s	8.6	58.5		44.5		38.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		5.6						

Intersection Summary	
HCM 6th Ctrl Delay	69.4
HCM 6th LOS	E

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	40	130	100	20	20	70	190	30	10	160	10
Future Vol, veh/h	10	40	130	100	20	20	70	190	30	10	160	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	11	42	137	105	21	21	74	200	32	11	168	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.1	10.4	12.2	10.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	24%	6%	71%	6%
Vol Thru, %	66%	22%	14%	89%
Vol Right, %	10%	72%	14%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	290	180	140	180
LT Vol	70	10	100	10
Through Vol	190	40	20	160
RT Vol	30	130	20	10
Lane Flow Rate	305	189	147	189
Geometry Grp	1	1	1	1
Degree of Util (X)	0.437	0.271	0.231	0.279
Departure Headway (Hd)	5.157	5.149	5.649	5.304
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	699	697	635	676
Service Time	3.189	3.186	3.688	3.338
HCM Lane V/C Ratio	0.436	0.271	0.231	0.28
HCM Control Delay	12.2	10.1	10.4	10.4
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	2.2	1.1	0.9	1.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	730	270	120	410	10	210	140	120	20	160	210
Future Volume (veh/h)	140	730	270	120	410	10	210	140	120	20	160	210
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	146	760	273	125	427	9	219	146	109	21	167	190
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	169	591	212	106	757	16	298	166	124	375	167	190
Arrive On Green	0.10	0.47	0.47	0.06	0.43	0.43	0.17	0.17	0.17	0.21	0.21	0.21
Sat Flow, veh/h	1711	1261	453	1711	1753	37	1725	959	716	1753	783	890
Grp Volume(v), veh/h	146	0	1033	125	0	436	219	0	255	21	0	357
Grp Sat Flow(s),veh/h/ln	1711	0	1714	1711	0	1790	1725	0	1675	1753	0	1673
Q Serve(g_s), s	12.2	0.0	68.0	9.0	0.0	26.5	17.5	0.0	21.6	1.4	0.0	30.9
Cycle Q Clear(g_c), s	12.2	0.0	68.0	9.0	0.0	26.5	17.5	0.0	21.6	1.4	0.0	30.9
Prop In Lane	1.00		0.26	1.00		0.02	1.00		0.43	1.00		0.53
Lane Grp Cap(c), veh/h	169	0	804	106	0	773	298	0	289	375	0	358
V/C Ratio(X)	0.86	0.00	1.29	1.18	0.00	0.56	0.74	0.00	0.88	0.06	0.00	1.00
Avail Cap(c_a), veh/h	259	0	804	106	0	773	357	0	346	375	0	358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.4	0.0	38.5	68.0	0.0	30.9	56.9	0.0	58.6	45.4	0.0	57.0
Incr Delay (d2), s/veh	16.5	0.0	137.8	142.8	0.0	0.9	6.3	0.0	19.9	0.1	0.0	47.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	58.1	8.1	0.0	11.5	8.0	0.0	10.6	0.6	0.0	17.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	0.0	176.3	210.8	0.0	31.9	63.2	0.0	78.4	45.4	0.0	104.1
LnGrp LOS	F	A	F	F	A	C	E	A	E	D	A	F
Approach Vol, veh/h		1179			561			474			378	
Approach Delay, s/veh		164.5			71.8			71.4			100.9	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	34.0	17.4	65.6	28.0	12.0	71.0
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	31.0	22.0	55.0	30.0	9.0	68.0
Max Q Clear Time (g_c+I1), s	32.9	14.2	28.5	23.6	11.0	70.0
Green Ext Time (p_c), s	0.0	0.2	2.6	1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	118.1
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	30	60	130	70	90
Future Vol, veh/h	50	30	60	130	70	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	58	35	70	151	81	105

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	221	0	-	0	297	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1360	-	-	-	696	904
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	879	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1360	-	-	-	666	904
Mov Cap-2 Maneuver	-	-	-	-	666	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	879	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1360	-	-	-	782
HCM Lane V/C Ratio	0.043	-	-	-	0.238
HCM Control Delay (s)	7.8	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	780	470	90	60	70
Future Vol, veh/h	90	780	470	90	60	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	96	830	500	96	64	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	500	0	-	0	1522	500
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	1022	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1034	-	-	0	131	573
Stage 1	-	-	-	0	611	-
Stage 2	-	-	-	0	349	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1034	-	-	-	119	573
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	349	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	34
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1034	-	-	258
HCM Lane V/C Ratio	0.093	-	-	0.536
HCM Control Delay (s)	8.8	-	-	34
HCM Lane LOS	A	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	2.9

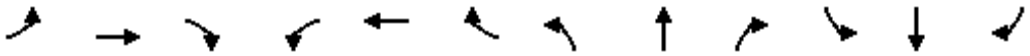
Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	10	310	10	10	480
Future Vol, veh/h	10	10	310	10	10	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	12	12	369	12	12	571

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	964	369	0	-	369	0
Stage 1	369	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	286	681	-	0	1190	-
Stage 1	704	-	-	0	-	-
Stage 2	555	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	283	681	-	-	1190	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	400	1190	-
HCM Lane V/C Ratio	-	0.06	0.01	-
HCM Control Delay (s)	-	14.6	8.1	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.2	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	412	10	65	610	102	20	100	55	162	50	100
Future Volume (veh/h)	70	412	10	65	610	102	20	100	55	162	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	76	448	10	71	663	102	22	109	60	176	54	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	71	799	18	64	735	113	25	124	68	205	148	57
Arrive On Green	0.05	0.51	0.52	0.04	0.50	0.51	0.13	0.13	0.14	0.12	0.12	0.13
Sat Flow, veh/h	1541	1577	35	1654	1470	226	190	941	518	1725	1241	483
Grp Volume(v), veh/h	76	0	458	71	0	765	191	0	0	176	0	75
Grp Sat Flow(s),veh/h/ln	1541	0	1612	1654	0	1696	1649	0	0	1725	0	1724
Q Serve(g_s), s	3.6	0.0	15.4	3.1	0.0	32.3	8.9	0.0	0.0	7.9	0.0	3.1
Cycle Q Clear(g_c), s	3.6	0.0	15.4	3.1	0.0	32.3	8.9	0.0	0.0	7.9	0.0	3.1
Prop In Lane	1.00		0.02	1.00		0.13	0.12		0.31	1.00		0.28
Lane Grp Cap(c), veh/h	71	0	817	64	0	848	218	0	0	205	0	205
V/C Ratio(X)	1.08	0.00	0.56	1.10	0.00	0.90	0.88	0.00	0.00	0.86	0.00	0.37
Avail Cap(c_a), veh/h	176	0	1271	231	0	1380	398	0	0	373	0	373
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.5	0.0	13.4	37.8	0.0	17.9	33.4	0.0	0.0	34.0	0.0	31.8
Incr Delay (d2), s/veh	72.1	0.0	0.6	83.0	0.0	5.3	10.8	0.0	0.0	9.8	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.9	2.7	0.0	11.8	4.0	0.0	0.0	3.7	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.6	0.0	14.0	120.8	0.0	23.1	44.1	0.0	0.0	43.8	0.0	32.9
LnGrp LOS	F	A	B	F	A	C	D	A	A	D	A	C
Approach Vol, veh/h		534			836			191			251	
Approach Delay, s/veh		27.6			31.4			44.1			40.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	43.3		14.4	7.0	43.8		13.4				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	10.0	65.0		20.0	12.0	63.0		18.0				
Max Q Clear Time (g_c+I1), s	5.6	34.3		10.9	5.1	17.4		9.9				
Green Ext Time (p_c), s	0.0	6.0		0.6	0.1	3.0		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			32.9									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	18.2

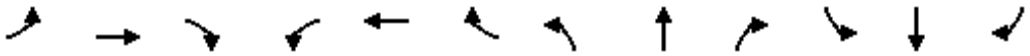
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	649	10	40	816	10	50	0	40	10	10	0
Future Vol, veh/h	0	649	10	40	816	10	50	0	40	10	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	21	21	21	12	12	12	2	2	2	67	67	67
Mvmt Flow	0	746	11	46	938	11	57	0	46	11	11	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	938	0	0	746	0	0	1788	1782	752	1782	1782	944
Stage 1	-	-	-	-	-	-	752	752	-	1036	1036	-
Stage 2	-	-	-	-	-	-	1036	1030	-	746	746	-
Critical Hdwy	4.31	-	-	4.22	-	-	7.12	6.52	6.22	7.77	7.17	6.87
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.77	6.17	-
Follow-up Hdwy	2.389	-	-	2.308	-	-	3.518	4.018	3.318	4.103	4.603	3.903
Pot Cap-1 Maneuver	658	-	-	818	-	-	63	82	410	44	57	243
Stage 1	-	-	-	-	-	-	402	418	-	213	239	-
Stage 2	-	-	-	-	-	-	280	311	-	320	338	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	658	-	-	818	-	-	~ 47	72	410	36	50	243
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 47	72	-	36	50	-
Stage 1	-	-	-	-	-	-	402	418	-	213	211	-
Stage 2	-	-	-	-	-	-	233	274	-	284	338	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	290.7	166.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	80	658	-	-	818	-	-	42
HCM Lane V/C Ratio	1.293	-	-	-	0.056	-	-	0.547
HCM Control Delay (s)	290.7	0	-	-	9.7	0	-	166.3
HCM Lane LOS	F	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	7.9	0	-	-	0.2	-	-	2

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	359	340	610	776	0	0	0	0	366	0	90
Future Volume (veh/h)	0	359	340	610	776	0	0	0	0	366	0	90
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1900	1574	1900
Adj Flow Rate, veh/h	0	390	341	663	843	0				398	0	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				0	22	0
Cap, veh/h	0	300	262	492	1234	0				280	0	39
Arrive On Green	0.00	0.38	0.38	0.20	0.48	0.00				0.22	0.00	0.21
Sat Flow, veh/h	0	782	684	1640	1722	0				1294	0	182
Grp Volume(v), veh/h	0	0	731	663	843	0				454	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1466	1640	1722	0				1476	0	0
Q Serve(g_s), s	0.0	0.0	46.0	36.0	45.4	0.0				26.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	46.0	36.0	45.4	0.0				26.0	0.0	0.0
Prop In Lane	0.00		0.47	1.00		0.00				0.88		0.12
Lane Grp Cap(c), veh/h	0	0	562	492	1234	0				320	0	0
V/C Ratio(X)	0.00	0.00	1.30	1.35	0.68	0.00				1.42	0.00	0.00
Avail Cap(c_a), veh/h	0	0	562	492	1234	0				320	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	37.1	47.9	20.6	0.0				47.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	148.1	157.6	0.3	0.0				206.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	38.8	36.5	19.0	0.0				27.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	185.2	205.6	20.9	0.0				253.1	0.0	0.0
LnGrp LOS	A	A	F	F	C	A				F	A	A
Approach Vol, veh/h		731			1506						454	
Approach Delay, s/veh		185.2			102.2						253.1	
Approach LOS		F			F						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		90.0		30.0	40.0	50.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		85.5		25.5	35.5	45.5						
Max Q Clear Time (g_c+I1), s		47.4		28.0	38.0	48.0						
Green Ext Time (p_c), s		7.2		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			150.2									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	635	0	0	1126	748	260	0	498	0	0	0
Future Volume (veh/h)	90	635	0	0	1126	748	260	0	498	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1900	1633	1900			
Adj Flow Rate, veh/h	94	661	0	0	1173	759	271	0	461			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	0	18	0			
Cap, veh/h	87	1049	0	0	576	373	142	0	242			
Arrive On Green	0.04	0.45	0.00	0.00	0.57	0.57	0.27	0.00	0.26			
Sat Flow, veh/h	1499	1574	0	0	1002	648	534	0	909			
Grp Volume(v), veh/h	94	661	0	0	0	1932	732	0	0			
Grp Sat Flow(s),veh/h/ln	1499	1574	0	0	0	1650	1443	0	0			
Q Serve(g_s), s	7.0	38.8	0.0	0.0	0.0	69.0	32.0	0.0	0.0			
Cycle Q Clear(g_c), s	7.0	38.8	0.0	0.0	0.0	69.0	32.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.39	0.37		0.63			
Lane Grp Cap(c), veh/h	87	1049	0	0	0	949	385	0	0			
V/C Ratio(X)	1.07	0.63	0.00	0.00	0.00	2.04	1.90	0.00	0.00			
Avail Cap(c_a), veh/h	87	1049	0	0	0	949	385	0	0			
HCM Platoon Ratio	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.00	0.09	1.00	0.00	0.00			
Uniform Delay (d), s/veh	57.7	21.8	0.0	0.0	0.0	25.6	44.2	0.0	0.0			
Incr Delay (d2), s/veh	51.2	0.3	0.0	0.0	0.0	466.7	415.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.9	15.0	0.0	0.0	0.0	147.2	55.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	108.9	22.1	0.0	0.0	0.0	492.3	459.8	0.0	0.0			
LnGrp LOS	F	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		755			1932			732				
Approach Delay, s/veh		32.9			492.3			459.8				
Approach LOS		C			F			F				

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.0	73.0		36.0		84.0						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	6.5	68.5		31.5		79.5						
Max Q Clear Time (g_c+I1), s	9.0	71.0		34.0		40.8						
Green Ext Time (p_c), s	0.0	0.0		0.0		4.9						

Intersection Summary		
HCM 6th Ctrl Delay	383.9	
HCM 6th LOS	F	

Intersection	
Intersection Delay, s/veh	40.4
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	30	132	172	60	50	152	184	52	40	315	20
Future Vol, veh/h	10	30	132	172	60	50	152	184	52	40	315	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	10	10	10	2	2	2	6	6	6	2	2	2
Mvmt Flow	11	34	152	198	69	57	175	211	60	46	362	23
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.1	29	52.6	46.5
HCM LOS	C	D	F	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	39%	6%	61%	11%
Vol Thru, %	47%	17%	21%	84%
Vol Right, %	13%	77%	18%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	388	172	282	375
LT Vol	152	10	172	40
Through Vol	184	30	60	315
RT Vol	52	132	50	20
Lane Flow Rate	446	198	324	431
Geometry Grp	1	1	1	1
Degree of Util (X)	0.927	0.453	0.718	0.893
Departure Headway (Hd)	7.484	8.255	7.972	7.459
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	482	435	454	483
Service Time	5.552	6.342	6.043	5.529
HCM Lane V/C Ratio	0.925	0.455	0.714	0.892
HCM Control Delay	52.6	18.1	29	46.5
HCM Lane LOS	F	C	D	E
HCM 95th-tile Q	10.9	2.3	5.6	9.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	615	359	159	75	648	132	388	239	133	101	268	838
Future Volume (veh/h)	615	359	159	75	648	132	388	239	133	101	268	838
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	641	374	156	78	675	133	404	249	127	105	279	796
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	185	362	151	77	366	72	328	215	110	561	133	379
Arrive On Green	0.12	0.33	0.34	0.05	0.26	0.27	0.19	0.19	0.20	0.32	0.32	0.33
Sat Flow, veh/h	1541	1085	452	1654	1409	278	1697	1112	567	1753	415	1183
Grp Volume(v), veh/h	641	0	530	78	0	808	404	0	376	105	0	1075
Grp Sat Flow(s),veh/h/ln	1541	0	1537	1654	0	1687	1697	0	1679	1753	0	1598
Q Serve(g_s), s	18.0	0.0	50.0	7.0	0.0	39.0	29.0	0.0	29.0	6.5	0.0	48.0
Cycle Q Clear(g_c), s	18.0	0.0	50.0	7.0	0.0	39.0	29.0	0.0	29.0	6.5	0.0	48.0
Prop In Lane	1.00		0.29	1.00		0.16	1.00		0.34	1.00		0.74
Lane Grp Cap(c), veh/h	185	0	512	77	0	439	328	0	325	561	0	511
V/C Ratio(X)	3.47	0.00	1.03	1.01	0.00	1.84	1.23	0.00	1.16	0.19	0.00	2.10
Avail Cap(c_a), veh/h	185	0	512	77	0	439	328	0	325	561	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.0	0.0	49.9	71.5	0.0	55.4	60.5	0.0	60.3	36.9	0.0	50.6
Incr Delay (d2), s/veh	1123.0	0.0	48.9	105.3	0.0	387.7	128.0	0.0	100.0	0.2	0.0	502.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	64.7	0.0	25.7	5.2	0.0	63.5	24.0	0.0	21.2	2.8	0.0	90.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1189.0	0.0	98.8	176.8	0.0	443.2	188.5	0.0	160.4	37.0	0.0	553.5
LnGrp LOS	F	A	F	F	A	F	F	A	F	D	A	F
Approach Vol, veh/h		1171			886			780			1180	
Approach Delay, s/veh		695.6			419.7			174.9			507.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	52.0	22.0	43.0	33.0	11.0	54.0
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	49.0	19.0	40.0	30.0	8.0	51.0
Max Q Clear Time (g_c+I1), s	50.0	20.0	41.0	31.0	9.0	52.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	478.4
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	62	40	100	100	90	192
Future Vol, veh/h	62	40	100	100	90	192
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	5	5	4	4	1	1
Mvmt Flow	75	48	120	120	108	231

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	243	0	-	0	381	183
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	198	-
Critical Hdwy	4.15	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1306	-	-	-	623	862
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	583	860
Mov Cap-2 Maneuver	-	-	-	-	583	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	835	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1302	-	-	-	747
HCM Lane V/C Ratio	0.057	-	-	-	0.455
HCM Control Delay (s)	7.9	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	513	805	110	70	50
Future Vol, veh/h	80	513	805	110	70	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	83	534	839	115	73	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	839	0	-	0	1539	839
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	716	-	-	0	129	369
Stage 1	-	-	-	0	427	-
Stage 2	-	-	-	0	496	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	716	-	-	-	114	369
Mov Cap-2 Maneuver	-	-	-	-	114	-
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	51.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	716	-	-	195
HCM Lane V/C Ratio	0.116	-	-	0.641
HCM Control Delay (s)	10.7	-	-	51.5
HCM Lane LOS	B	-	-	F
HCM 95th %tile Q(veh)	0.4	-	-	3.8

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	22	627	10	12	296
Future Vol, veh/h	10	22	627	10	12	296
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	12	12	6	6	5	5
Mvmt Flow	12	26	746	12	14	352

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1126	746	0	-	746	0
Stage 1	746	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	6.52	6.32	-	-	4.15	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.408	-	-	2.245	-
Pot Cap-1 Maneuver	217	398	-	0	849	-
Stage 1	451	-	-	0	-	-
Stage 2	670	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	214	398	-	-	849	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	314	849	-
HCM Lane V/C Ratio	-	0.121	0.017	-
HCM Control Delay (s)	-	18	9.3	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	30	387	615	4
Future Vol, veh/h	1	0	30	387	615	4
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	33	421	668	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1157	670	672	0	-	0
Stage 1	670	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	217	457	919	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	207	457	919	-	-	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	485	-	-	-	-	-
Stage 2	618	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.5	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	919	-	207	-	-
HCM Lane V/C Ratio	0.035	-	0.005	-	-
HCM Control Delay (s)	9.1	0	22.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	35	34	0	2	0	414	34	2	613	0
Future Vol, veh/h	1	0	35	34	0	2	0	414	34	2	613	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	38	37	0	2	0	450	37	2	666	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1140	1157	666	1158	1139	469	666	0	0	487	0	0
Stage 1	670	670	-	469	469	-	-	-	-	-	-	-
Stage 2	470	487	-	689	670	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	178	196	459	173	201	594	923	-	-	1076	-	-
Stage 1	446	455	-	575	561	-	-	-	-	-	-	-
Stage 2	574	550	-	436	455	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	177	195	459	158	200	594	923	-	-	1076	-	-
Mov Cap-2 Maneuver	177	195	-	158	200	-	-	-	-	-	-	-
Stage 1	446	454	-	575	561	-	-	-	-	-	-	-
Stage 2	572	550	-	399	454	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	33.5	0	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	923	-	-	440	165	1076	-	-
HCM Lane V/C Ratio	-	-	-	0.089	0.237	0.002	-	-
HCM Control Delay (s)	0	-	-	14	33.5	8.4	0	-
HCM Lane LOS	A	-	-	B	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.9	0	-	-

Intersection	
Int Delay, s/veh	141.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	320	26	422	320	26	656
Future Vol, veh/h	320	26	422	320	26	656
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	348	28	459	348	28	713

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1402	633	0	0	807	0
Stage 1	633	-	-	-	-	-
Stage 2	769	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 154	480	-	-	818	-
Stage 1	529	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 145	480	-	-	818	-
Mov Cap-2 Maneuver	~ 145	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	431	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 722.2	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	153	818	-
HCM Lane V/C Ratio	-	-	2.458	0.035	-
HCM Control Delay (s)	-	-	$ 722.2	9.6	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	32.3	0.1	-

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

Intersection	
Int Delay, s/veh	172.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	252	265	721	955	21
Future Vol, veh/h	21	252	265	721	955	21
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	274	288	784	1038	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2410	1050	1061	0	-	0
Stage 1	1050	-	-	-	-	-
Stage 2	1360	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	36	276	657	-	-	-
Stage 1	337	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 8	276	657	-	-	-
Mov Cap-2 Maneuver	~ 8	-	-	-	-	-
Stage 1	75	-	-	-	-	-
Stage 2	239	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	1396.2	3.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	657	-	77	-	-
HCM Lane V/C Ratio	0.438	-	3.854	-	-
HCM Control Delay (s)	14.7	$	1396.2	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	2.2	-	31.1	-	-

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

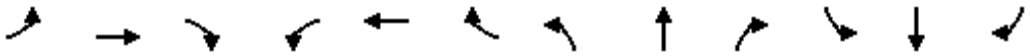
Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	1	1	748	477	25
Future Vol, veh/h	12	1	1	748	477	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	1	1	813	518	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1347	532	545	0	-	0
Stage 1	532	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	167	547	1024	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	167	547	1024	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1024	-	313	-	-
HCM Lane V/C Ratio	0.001	-	0.045	-	-
HCM Control Delay (s)	8.5	-	17	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	833	30	73	315	131	10	100	63	220	110	20
Future Volume (veh/h)	90	833	30	73	315	131	10	100	63	220	110	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	97	896	31	78	339	124	11	108	68	237	118	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	107	951	33	83	659	241	12	118	74	258	239	26
Arrive On Green	0.06	0.54	0.55	0.05	0.53	0.54	0.12	0.12	0.12	0.15	0.15	0.16
Sat Flow, veh/h	1739	1754	61	1697	1244	455	104	1019	642	1753	1629	179
Grp Volume(v), veh/h	97	0	927	78	0	463	187	0	0	237	0	131
Grp Sat Flow(s),veh/h/ln	1739	0	1815	1697	0	1700	1764	0	0	1753	0	1808
Q Serve(g_s), s	6.0	0.0	52.2	5.0	0.0	19.1	11.4	0.0	0.0	14.5	0.0	7.3
Cycle Q Clear(g_c), s	6.0	0.0	52.2	5.0	0.0	19.1	11.4	0.0	0.0	14.5	0.0	7.3
Prop In Lane	1.00		0.03	1.00		0.27	0.06		0.36	1.00		0.10
Lane Grp Cap(c), veh/h	107	0	983	83	0	900	204	0	0	258	0	266
V/C Ratio(X)	0.91	0.00	0.94	0.94	0.00	0.51	0.92	0.00	0.00	0.92	0.00	0.49
Avail Cap(c_a), veh/h	207	0	1132	109	0	966	243	0	0	305	0	315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	0.0	23.4	51.7	0.0	16.5	47.5	0.0	0.0	45.9	0.0	42.7
Incr Delay (d2), s/veh	22.9	0.0	14.0	58.4	0.0	0.5	33.2	0.0	0.0	29.0	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	23.8	3.4	0.0	7.0	6.8	0.0	0.0	8.2	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	0.0	37.3	110.1	0.0	17.0	80.8	0.0	0.0	74.9	0.0	44.2
LnGrp LOS	E	A	D	F	A	B	F	A	A	E	A	D
Approach Vol, veh/h		1024			541			187			368	
Approach Delay, s/veh		40.8			30.4			80.8			63.9	
Approach LOS		D			C			F			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	61.7		16.6	9.4	63.1		20.0				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	14.0	63.0		16.0	8.0	69.0		20.0				
Max Q Clear Time (g_c+I1), s	8.0	21.1		13.4	7.0	54.2		16.5				
Green Ext Time (p_c), s	0.1	3.1		0.2	0.0	5.9		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			45.7									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	10.4

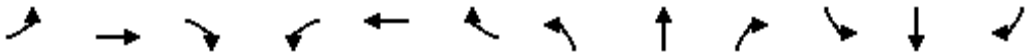
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	1205	30	80	509	20	20	0	50	20	0	10
Future Vol, veh/h	10	1205	30	80	509	20	20	0	50	20	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	Yield	-	-	Stop	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	10	10	10	5	5	5	9	9	9
Mvmt Flow	11	1310	33	87	553	22	22	0	54	22	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	553	0	0	1310	0	0	2076	2076	1327	2070	2070	564
Stage 1	-	-	-	-	-	-	1349	1349	-	738	738	-
Stage 2	-	-	-	-	-	-	727	727	-	1332	1332	-
Critical Hdwy	4.14	-	-	4.2	-	-	7.15	6.55	6.25	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.19	5.59	-
Follow-up Hdwy	2.236	-	-	2.29	-	-	3.545	4.045	3.345	3.581	4.081	3.381
Pot Cap-1 Maneuver	1007	-	-	503	-	-	39	53	187	38	52	512
Stage 1	-	-	-	-	-	-	183	216	-	399	414	-
Stage 2	-	-	-	-	-	-	411	425	-	184	216	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1007	-	-	503	-	-	30	38	187	~ 21	37	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	30	38	-	~ 21	37	-
Stage 1	-	-	-	-	-	-	175	206	-	381	308	-
Stage 2	-	-	-	-	-	-	300	317	-	125	206	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.8	123.3	$ 349
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	95	1007	-	-	503	-	-	32
HCM Lane V/C Ratio	0.801	0.011	-	-	0.173	-	-	1.019
HCM Control Delay (s)	123.3	8.6	0	-	13.6	0	-	$ 349
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	4.3	0	-	-	0.6	-	-	3.5

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	535	740	548	469	0	0	0	0	493	0	140
Future Volume (veh/h)	0	535	740	548	469	0	0	0	0	493	0	140
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1900	1767	1900
Adj Flow Rate, veh/h	0	582	763	596	510	0				536	0	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				0	9	0
Cap, veh/h	0	330	433	365	1266	0				296	0	61
Arrive On Green	0.00	0.47	0.46	0.36	1.00	0.00				0.22	0.00	0.21
Sat Flow, veh/h	0	708	928	1682	1767	0				1367	0	281
Grp Volume(v), veh/h	0	0	1345	596	510	0				646	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1636	1682	1767	0				1648	0	0
Q Serve(g_s), s	0.0	0.0	56.0	26.0	0.0	0.0				26.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	56.0	26.0	0.0	0.0				26.0	0.0	0.0
Prop In Lane	0.00		0.57	1.00		0.00				0.83		0.17
Lane Grp Cap(c), veh/h	0	0	763	365	1266	0				357	0	0
V/C Ratio(X)	0.00	0.00	1.76	1.63	0.40	0.00				1.81	0.00	0.00
Avail Cap(c_a), veh/h	0	0	763	365	1266	0				357	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.09	0.09	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	32.1	38.3	0.0	0.0				47.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	348.3	286.9	0.1	0.0				375.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	94.5	38.0	0.0	0.0				47.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	380.5	325.1	0.1	0.0				422.2	0.0	0.0
LnGrp LOS	A	A	F	F	A	A				F	A	A
Approach Vol, veh/h		1345			1106						646	
Approach Delay, s/veh		380.5			175.3						422.2	
Approach LOS		F			F						F	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		90.0		30.0	30.0	60.0						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		85.5		25.5	25.5	55.5						
Max Q Clear Time (g_c+I1), s		2.0		28.0	28.0	58.0						
Green Ext Time (p_c), s		3.5		0.0	0.0	0.0						

Intersection Summary												
HCM 6th Ctrl Delay			315.9									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	938	0	0	807	463	210	0	639	0	0	0
Future Volume (veh/h)	90	938	0	0	807	463	210	0	639	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1900	1781	1900			
Adj Flow Rate, veh/h	95	987	0	0	849	470	221	0	589			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	0	8	0			
Cap, veh/h	86	1093	0	0	561	310	138	0	368			
Arrive On Green	0.05	0.61	0.00	0.00	0.52	0.52	0.32	0.00	0.32			
Sat Flow, veh/h	1711	1796	0	0	1068	591	425	0	1132			
Grp Volume(v), veh/h	95	987	0	0	0	1319	810	0	0			
Grp Sat Flow(s),veh/h/ln	1711	1796	0	0	0	1659	1556	0	0			
Q Serve(g_s), s	6.0	57.3	0.0	0.0	0.0	63.0	39.0	0.0	0.0			
Cycle Q Clear(g_c), s	6.0	57.3	0.0	0.0	0.0	63.0	39.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.36	0.27		0.73			
Lane Grp Cap(c), veh/h	86	1093	0	0	0	871	506	0	0			
V/C Ratio(X)	1.11	0.90	0.00	0.00	0.00	1.51	1.60	0.00	0.00			
Avail Cap(c_a), veh/h	86	1093	0	0	0	871	506	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.00	0.09	1.00	0.00	0.00			
Uniform Delay (d), s/veh	57.0	20.4	0.0	0.0	0.0	28.6	40.7	0.0	0.0			
Incr Delay (d2), s/veh	64.5	1.3	0.0	0.0	0.0	232.1	279.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.1	21.7	0.0	0.0	0.0	79.1	53.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	121.5	21.8	0.0	0.0	0.0	260.7	320.4	0.0	0.0			
LnGrp LOS	F	C	A	A	A	F	F	A	A			
Approach Vol, veh/h		1082			1319			810				
Approach Delay, s/veh		30.5			260.7			320.4				
Approach LOS		C			F			F				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	10.0	67.0		43.0		77.0			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	5.5	62.5		38.5		72.5			
Max Q Clear Time (g_c+I1), s	8.0	65.0		41.0		59.3			
Green Ext Time (p_c), s	0.0	0.0		0.0		6.0			

Intersection Summary		
HCM 6th Ctrl Delay	198.2	
HCM 6th LOS	F	

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	40	130	100	20	20	70	194	30	10	163	10
Future Vol, veh/h	10	40	130	100	20	20	70	194	30	10	163	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	6	6	6	4	4	4	3	3	3	2	2	2
Mvmt Flow	11	42	137	105	21	21	74	204	32	11	172	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.1	10.4	12.3	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	24%	6%	71%	5%
Vol Thru, %	66%	22%	14%	89%
Vol Right, %	10%	72%	14%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	294	180	140	183
LT Vol	70	10	100	10
Through Vol	194	40	20	163
RT Vol	30	130	20	10
Lane Flow Rate	309	189	147	193
Geometry Grp	1	1	1	1
Degree of Util (X)	0.444	0.272	0.232	0.284
Departure Headway (Hd)	5.167	5.171	5.671	5.315
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	696	693	632	676
Service Time	3.198	3.21	3.713	3.351
HCM Lane V/C Ratio	0.444	0.273	0.233	0.286
HCM Control Delay	12.3	10.1	10.4	10.5
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	2.3	1.1	0.9	1.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	624	675	278	122	374	63	233	146	127	92	165	663
Future Volume (veh/h)	624	675	278	122	374	63	233	146	127	92	165	663
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	650	703	281	127	390	62	243	152	114	96	172	596
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	316	442	177	70	331	53	297	165	124	552	113	393
Arrive On Green	0.18	0.36	0.37	0.04	0.22	0.23	0.17	0.17	0.18	0.31	0.31	0.32
Sat Flow, veh/h	1711	1220	488	1711	1512	240	1725	957	718	1753	360	1249
Grp Volume(v), veh/h	650	0	984	127	0	452	243	0	266	96	0	768
Grp Sat Flow(s),veh/h/ln	1711	0	1708	1711	0	1752	1725	0	1675	1753	0	1609
Q Serve(g_s), s	27.0	0.0	53.0	6.0	0.0	32.0	19.8	0.0	22.8	5.8	0.0	46.0
Cycle Q Clear(g_c), s	27.0	0.0	53.0	6.0	0.0	32.0	19.8	0.0	22.8	5.8	0.0	46.0
Prop In Lane	1.00		0.29	1.00		0.14	1.00		0.43	1.00		0.78
Lane Grp Cap(c), veh/h	316	0	619	70	0	384	297	0	288	552	0	506
V/C Ratio(X)	2.06	0.00	1.59	1.81	0.00	1.18	0.82	0.00	0.92	0.17	0.00	1.52
Avail Cap(c_a), veh/h	316	0	619	70	0	384	342	0	332	552	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.6	0.0	46.4	70.1	0.0	57.0	58.3	0.0	59.3	36.3	0.0	49.7
Incr Delay (d2), s/veh	486.4	0.0	272.7	414.2	0.0	104.1	12.9	0.0	28.2	0.1	0.0	242.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	54.2	0.0	68.8	10.7	0.0	25.0	9.6	0.0	11.8	2.5	0.0	52.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	546.0	0.0	319.2	484.3	0.0	161.1	71.2	0.0	87.6	36.5	0.0	292.2
LnGrp LOS	F	A	F	F	A	F	E	A	F	D	A	F
Approach Vol, veh/h		1634			579			509			864	
Approach Delay, s/veh		409.4			232.0			79.7			263.8	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	50.0	31.0	36.0	29.2	10.0	57.0
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	47.0	28.0	33.0	30.0	7.0	54.0
Max Q Clear Time (g_c+I1), s	48.0	29.0	34.0	24.8	8.0	55.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	298.9
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	30	60	130	70	90
Future Vol, veh/h	50	30	60	130	70	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	58	35	70	151	81	105

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	221	0	-	0	297	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.1	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1360	-	-	-	696	904
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	879	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1360	-	-	-	666	904
Mov Cap-2 Maneuver	-	-	-	-	666	-
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	879	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1360	-	-	-	782
HCM Lane V/C Ratio	0.043	-	-	-	0.238
HCM Control Delay (s)	7.8	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	804	489	90	60	70
Future Vol, veh/h	90	804	489	90	60	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	96	855	520	96	64	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	520	0	-	0	1567	520
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	1047	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1016	-	-	0	123	558
Stage 1	-	-	-	0	599	-
Stage 2	-	-	-	0	339	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1016	-	-	-	111	558
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	339	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	38.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1016	-	-	241
HCM Lane V/C Ratio	0.094	-	-	0.574
HCM Control Delay (s)	8.9	-	-	38.3
HCM Lane LOS	A	-	-	E
HCM 95th %tile Q(veh)	0.3	-	-	3.2

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	11	316	10	11	486
Future Vol, veh/h	10	11	316	10	11	486
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	7	7	2	2
Mvmt Flow	12	13	376	12	13	579

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	981	376	0	-	376	0
Stage 1	376	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	279	675	-	0	1182	-
Stage 1	699	-	-	0	-	-
Stage 2	549	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	276	675	-	-	1182	-
Mov Cap-2 Maneuver	276	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	543	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	400	1182	-
HCM Lane V/C Ratio	-	0.063	0.011	-
HCM Control Delay (s)	-	14.6	8.1	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	26	294	392	1
Future Vol, veh/h	1	0	26	294	392	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	28	320	426	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	803	427	427	0	-	0
Stage 1	427	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	353	628	1132	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	628	1132	-	-	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1132	-	342	-	-
HCM Lane V/C Ratio	0.025	-	0.003	-	-
HCM Control Delay (s)	8.3	0	15.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	31	40	0	1	0	318	42	1	391	0
Future Vol, veh/h	1	0	31	40	0	1	0	318	42	1	391	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	34	43	0	1	0	346	46	1	425	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	797	819	425	813	796	369	425	0	0	392	0	0
Stage 1	427	427	-	369	369	-	-	-	-	-	-	-
Stage 2	370	392	-	444	427	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	305	310	629	297	320	677	1134	-	-	1167	-	-
Stage 1	606	585	-	651	621	-	-	-	-	-	-	-
Stage 2	650	606	-	593	585	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	304	310	629	281	320	677	1134	-	-	1167	-	-
Mov Cap-2 Maneuver	304	310	-	281	320	-	-	-	-	-	-	-
Stage 1	606	584	-	651	621	-	-	-	-	-	-	-
Stage 2	649	606	-	561	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	20	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1134	-	-	609	285	1167	-	-
HCM Lane V/C Ratio	-	-	-	0.057	0.156	0.001	-	-
HCM Control Delay (s)	0	-	-	11.3	20	8.1	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.5	0	-	-

Intersection	
Int Delay, s/veh	27.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	256	12	348	260	12	450
Future Vol, veh/h	256	12	348	260	12	450
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	278	13	378	283	13	489

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1035	520	0	0	661	0
Stage 1	520	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 257	556	-	-	927	-
Stage 1	597	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 252	556	-	-	927	-
Mov Cap-2 Maneuver	~ 252	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	137.1	0	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	258	927	-
HCM Lane V/C Ratio	-	-	1.129	0.014	-
HCM Control Delay (s)	-	-	137.1	8.9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	12.7	0	-

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

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	222	233	600	698	8
Future Vol, veh/h	8	222	233	600	698	8
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	241	253	652	759	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1922	764	768	0	-	0
Stage 1	764	-	-	-	-	-
Stage 2	1158	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	74	404	846	-	-	-
Stage 1	460	-	-	-	-	-
Stage 2	299	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	39	404	846	-	-	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	244	-	-	-	-	-
Stage 2	299	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	53.7	3.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	846	-	305	-	-
HCM Lane V/C Ratio	0.299	-	0.82	-	-
HCM Control Delay (s)	11.1	0	53.7	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	1.3	-	6.8	-	-

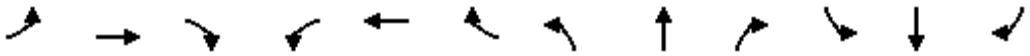
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	31	2	1	474	554	11
Future Vol, veh/h	31	2	1	474	554	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	1	515	602	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1125	608	614	0	-	0
Stage 1	608	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	227	496	965	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	496	965	-	-	-
Mov Cap-2 Maneuver	363	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	965	-	369	-	-
HCM Lane V/C Ratio	0.001	-	0.097	-	-
HCM Control Delay (s)	8.7	-	15.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	412	10	65	610	102	20	100	55	162	50	100
Future Volume (veh/h)	70	412	10	65	610	102	20	100	55	162	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1752	1752	1752	1811	1811	1811
Adj Flow Rate, veh/h	76	448	10	71	663	99	22	109	60	176	54	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	19	19	11	11	11	10	10	10	6	6	6
Cap, veh/h	50	1062	24	49	988	147	29	145	185	237	120	109
Arrive On Green	0.03	0.35	0.37	0.03	0.34	0.37	0.10	0.10	0.12	0.14	0.14	0.16
Sat Flow, veh/h	1541	3075	69	1654	2880	430	292	1445	1485	1725	875	794
Grp Volume(v), veh/h	76	224	234	71	380	382	131	0	60	176	0	103
Grp Sat Flow(s),veh/h/ln	1541	1537	1606	1654	1650	1660	1737	0	1485	1725	0	1668
Q Serve(g_s), s	1.3	4.6	4.6	1.2	8.1	8.1	3.0	0.0	1.5	4.1	0.0	2.3
Cycle Q Clear(g_c), s	1.3	4.6	4.6	1.2	8.1	8.1	3.0	0.0	1.5	4.1	0.0	2.3
Prop In Lane	1.00		0.04	1.00		0.26	0.17		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	50	531	555	49	566	569	174	0	185	237	0	229
V/C Ratio(X)	1.53	0.42	0.42	1.44	0.67	0.67	0.75	0.00	0.32	0.74	0.00	0.45
Avail Cap(c_a), veh/h	485	1748	1826	440	1796	1806	1008	0	898	918	0	888
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	10.4	10.4	20.1	11.6	11.5	18.1	0.0	16.5	17.1	0.0	16.2
Incr Delay (d2), s/veh	261.0	0.5	0.5	222.2	1.4	1.4	6.4	0.0	1.0	4.5	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	1.2	1.2	3.4	2.3	2.3	1.3	0.0	0.5	1.6	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	281.1	10.9	10.9	242.2	13.0	12.9	24.5	0.0	17.5	21.7	0.0	17.5
LnGrp LOS	F	B	B	F	B	B	C	A	B	C	A	B
Approach Vol, veh/h		534			833			191			279	
Approach Delay, s/veh		49.3			32.5			22.3			20.1	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	18.2		8.2	5.2	18.3		9.7				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	14.0	46.0		25.0	12.0	48.0		23.0				
Max Q Clear Time (g_c+I1), s	3.3	10.1		5.0	3.2	6.6		6.1				
Green Ext Time (p_c), s	0.1	5.1		0.8	0.1	2.8		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			34.4									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	359	340	610	776	0	0	0	0	366	0	90
Future Volume (veh/h)	0	359	340	610	776	0	0	0	0	366	0	90
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	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	0	1589	1589	1722	1722	0				1574	0	1574
Adj Flow Rate, veh/h	0	390	170	663	843	0				398	0	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	21	21	12	12	0				22	0	22
Cap, veh/h	0	801	673	747	2527	0				468	0	209
Arrive On Green	0.00	0.50	0.50	0.31	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	1589	1346	3182	3358	0				2908	0	1334
Grp Volume(v), veh/h	0	390	170	663	843	0				398	0	16
Grp Sat Flow(s),veh/h/ln	0	1589	1346	1591	1636	0				1454	0	1334
Q Serve(g_s), s	0.0	19.4	8.7	23.8	0.0	0.0				16.0	0.0	1.2
Cycle Q Clear(g_c), s	0.0	19.4	8.7	23.8	0.0	0.0				16.0	0.0	1.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	801	673	747	2527	0				468	0	209
V/C Ratio(X)	0.00	0.49	0.25	0.89	0.33	0.00				0.85	0.00	0.08
Avail Cap(c_a), veh/h	0	801	673	955	2527	0				606	0	272
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.67	0.67	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.5	17.2	39.8	0.0	0.0				48.9	0.0	43.2
Incr Delay (d2), s/veh	0.0	2.1	0.9	6.0	0.2	0.0				8.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	2.8	9.1	0.1	0.0				6.3	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.6	18.1	45.7	0.2	0.0				57.8	0.0	43.3
LnGrp LOS	A	C	B	D	A	A				E	A	D
Approach Vol, veh/h		560			1506						414	
Approach Delay, s/veh		20.6			20.3						57.3	
Approach LOS		C			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		96.7		23.3	32.2	64.5						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		86.5		24.5	35.5	46.5						
Max Q Clear Time (g_c+I1), s		2.0		18.0	25.8	21.4						
Green Ext Time (p_c), s		6.8		0.9	1.9	2.9						

Intersection Summary												
HCM 6th Ctrl Delay			26.5									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	635	0	0	1126	748	260	0	498	0	0	0
Future Volume (veh/h)	90	635	0	0	1126	748	260	0	498	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1574	1574	0	0	1767	1767	1633	0	1633			
Adj Flow Rate, veh/h	94	661	0	0	1173	412	271	0	380			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	22	22	0	0	9	9	18	0	18			
Cap, veh/h	120	1890	0	0	1741	770	469	0	411			
Arrive On Green	0.03	0.21	0.00	0.00	0.52	0.51	0.30	0.00	0.30			
Sat Flow, veh/h	1499	3069	0	0	3445	1497	1555	0	1384			
Grp Volume(v), veh/h	94	661	0	0	1173	412	271	0	380			
Grp Sat Flow(s),veh/h/ln	1499	1495	0	0	1678	1497	1555	0	1384			
Q Serve(g_s), s	7.5	22.6	0.0	0.0	31.0	22.1	17.7	0.0	31.9			
Cycle Q Clear(g_c), s	7.5	22.6	0.0	0.0	31.0	22.1	17.7	0.0	31.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	120	1890	0	0	1741	770	469	0	411			
V/C Ratio(X)	0.78	0.35	0.00	0.00	0.67	0.53	0.58	0.00	0.92			
Avail Cap(c_a), veh/h	150	1890	0	0	1741	770	583	0	513			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	0.74	0.74	1.00	0.00	1.00			
Uniform Delay (d), s/veh	57.4	26.4	0.0	0.0	21.4	19.5	35.5	0.0	40.8			
Incr Delay (d2), s/veh	14.0	0.4	0.0	0.0	1.6	2.0	1.1	0.0	19.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.4	9.1	0.0	0.0	11.8	7.7	6.7	0.0	12.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.4	26.8	0.0	0.0	22.9	21.5	36.6	0.0	60.7			
LnGrp LOS	E	C	A	A	C	C	D	A	E			
Approach Vol, veh/h		755			1585			651				
Approach Delay, s/veh		32.4			22.6			50.7				
Approach LOS		C			C			D				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	13.6	66.2		40.2		79.8			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	11.5	50.5		44.5		66.5			
Max Q Clear Time (g_c+I1), s	9.5	33.0		33.9		24.6			
Green Ext Time (p_c), s	0.0	9.2		1.8		4.9			

Intersection Summary		
HCM 6th Ctrl Delay	31.2	
HCM 6th LOS	C	

MOVEMENT SUMMARY

Site: 5 [9th St/Golden State Blvd at Nunes Rd - AM Peak]

Cumulative plus Project Trips Combined with Mitigations
AM Peak Hour
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Golden State Blvd											
1	L2	34	3.0	0.324	6.7	LOS A	1.5	10.9	0.21	0.10	49.7
2	T1	223	3.0	0.324	6.7	LOS A	1.5	10.9	0.21	0.10	50.8
3	R2	80	3.0	0.324	6.7	LOS A	1.5	10.9	0.21	0.10	50.8
Approach		338	3.0	0.324	6.7	LOS A	1.5	10.9	0.21	0.10	50.7
East: Nunes Rd											
4	L2	115	4.0	0.209	6.9	LOS A	0.8	5.6	0.46	0.40	49.8
5	T1	23	4.0	0.209	6.9	LOS A	0.8	5.6	0.46	0.40	51.0
6	R2	23	4.0	0.209	6.9	LOS A	0.8	5.6	0.46	0.40	50.9
Approach		161	4.0	0.209	6.9	LOS A	0.8	5.6	0.46	0.40	50.1
North: 9th St											
7	L2	11	2.0	0.251	7.0	LOS A	1.0	7.1	0.43	0.35	50.1
8	T1	187	2.0	0.251	7.0	LOS A	1.0	7.1	0.43	0.35	51.2
9	R2	11	2.0	0.251	7.0	LOS A	1.0	7.1	0.43	0.35	51.2
Approach		210	2.0	0.251	7.0	LOS A	1.0	7.1	0.43	0.35	51.2
West: Nunes Rd											
10	L2	11	6.0	0.265	7.6	LOS A	1.0	7.6	0.46	0.41	47.7
11	T1	46	6.0	0.265	7.6	LOS A	1.0	7.6	0.46	0.41	48.8
12	R2	149	6.0	0.265	7.6	LOS A	1.0	7.6	0.46	0.41	48.7
Approach		207	6.0	0.265	7.6	LOS A	1.0	7.6	0.46	0.41	48.7
All Vehicles		916	3.6	0.324	7.0	LOS A	1.5	10.9	0.36	0.28	50.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	615	359	159	75	648	132	388	239	133	101	268	838
Future Volume (veh/h)	615	359	159	75	648	132	388	239	133	101	268	838
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1737	1737	1737	1781	1781	1781	1841	1841	1841
Adj Flow Rate, veh/h	641	374	118	78	675	89	404	249	37	105	279	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	19	19	19	11	11	11	8	8	8	4	4	4
Cap, veh/h	670	1863	842	97	1360	619	434	652	303	130	346	
Arrive On Green	0.37	1.00	1.00	0.03	0.41	0.42	0.13	0.19	0.20	0.04	0.10	0.00
Sat Flow, veh/h	2990	3075	1372	3209	3300	1472	3291	3385	1510	3401	3497	1560
Grp Volume(v), veh/h	641	374	118	78	675	89	404	249	37	105	279	0
Grp Sat Flow(s),veh/h/ln	1495	1537	1372	1605	1650	1472	1646	1692	1510	1700	1749	1560
Q Serve(g_s), s	25.1	0.0	0.0	2.9	18.1	4.5	14.6	7.7	2.4	3.7	9.4	0.0
Cycle Q Clear(g_c), s	25.1	0.0	0.0	2.9	18.1	4.5	14.6	7.7	2.4	3.7	9.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	670	1863	842	97	1360	619	434	652	303	130	346	
V/C Ratio(X)	0.96	0.20	0.14	0.80	0.50	0.14	0.93	0.38	0.12	0.81	0.81	
Avail Cap(c_a), veh/h	723	1863	842	187	1360	619	466	1072	491	227	845	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.0	0.0	0.0	57.8	26.1	21.5	51.6	42.2	39.3	57.3	52.9	0.0
Incr Delay (d2), s/veh	18.9	0.2	0.3	14.1	1.3	0.5	24.7	0.4	0.2	11.3	4.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	0.0	0.1	1.3	7.1	1.6	7.4	3.2	0.9	1.8	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	0.2	0.3	72.0	27.4	22.0	76.3	42.6	39.5	68.5	57.4	0.0
LnGrp LOS	E	A	A	E	C	C	E	D	D	E	E	
Approach Vol, veh/h		1133			842			690			384	A
Approach Delay, s/veh		31.7			30.9			62.1			60.4	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.9	53.4	8.6	27.1	7.6	76.7	19.8	15.9
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	30.0	30.0	9.0	39.0	8.0	52.0	18.0	30.0
Max Q Clear Time (g_c+I1), s	27.1	20.1	5.7	9.7	4.9	2.0	16.6	11.4
Green Ext Time (p_c), s	0.8	3.3	0.1	1.6	0.0	3.0	0.2	1.5

Intersection Summary	
HCM 6th Ctrl Delay	42.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

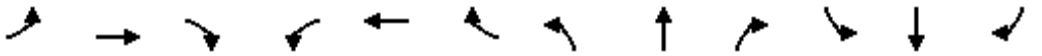
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	513	805	110	70	50
Future Vol, veh/h	80	513	805	110	70	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	22	22	11	11	0	0
Mvmt Flow	83	534	839	115	73	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	839	0	-	0	1539	839
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	4.32	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.398	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	716	-	-	0	129	369
Stage 1	-	-	-	0	427	-
Stage 2	-	-	-	0	496	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	716	-	-	-	114	369
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	716	-	-	422
HCM Lane V/C Ratio	0.116	-	-	0.296
HCM Control Delay (s)	10.7	-	-	17.1
HCM Lane LOS	B	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	1.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	833	30	73	315	131	10	100	63	220	110	20
Future Volume (veh/h)	90	833	30	73	315	131	10	100	63	220	110	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1781	1781	1781	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	97	896	30	78	339	103	11	108	68	237	118	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	5	5	5	8	8	8	1	1	1	4	4	4
Cap, veh/h	74	1280	43	56	935	280	15	148	172	307	277	38
Arrive On Green	0.04	0.37	0.39	0.03	0.36	0.38	0.09	0.09	0.11	0.17	0.17	0.20
Sat Flow, veh/h	1739	3425	115	1697	2567	768	173	1703	1598	1753	1587	215
Grp Volume(v), veh/h	97	454	472	78	222	220	119	0	68	237	0	134
Grp Sat Flow(s),veh/h/ln	1739	1735	1805	1697	1692	1643	1877	0	1598	1753	0	1802
Q Serve(g_s), s	2.1	10.7	10.7	1.6	4.6	4.7	3.0	0.0	1.9	6.2	0.0	3.2
Cycle Q Clear(g_c), s	2.1	10.7	10.7	1.6	4.6	4.7	3.0	0.0	1.9	6.2	0.0	3.2
Prop In Lane	1.00		0.06	1.00		0.47	0.09		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	74	648	675	56	616	598	163	0	172	307	0	315
V/C Ratio(X)	1.31	0.70	0.70	1.39	0.36	0.37	0.73	0.00	0.40	0.77	0.00	0.43
Avail Cap(c_a), veh/h	468	1617	1683	422	1542	1498	816	0	728	944	0	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	12.8	12.8	23.3	11.2	11.1	21.5	0.0	20.1	19.0	0.0	17.7
Incr Delay (d2), s/veh	157.2	1.4	1.3	198.2	0.4	0.4	6.1	0.0	1.5	4.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	3.4	3.5	3.6	1.4	1.4	1.4	0.0	0.7	2.5	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	180.3	14.2	14.1	221.6	11.6	11.5	27.6	0.0	21.6	23.2	0.0	18.6
LnGrp LOS	F	B	B	F	B	B	C	A	C	C	A	B
Approach Vol, veh/h		1023			520			187			371	
Approach Delay, s/veh		29.9			43.0			25.4			21.5	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	21.6		8.2	5.6	22.0		12.4				
Change Period (Y+Rc), s	3.0	3.0		3.0	3.0	3.0		3.0				
Max Green Setting (Gmax), s	14.0	45.0		22.0	13.0	46.0		27.0				
Max Q Clear Time (g_c+I1), s	4.1	6.7		5.0	3.6	12.7		8.2				
Green Ext Time (p_c), s	0.1	2.7		0.7	0.1	6.3		1.3				

Intersection Summary			
HCM 6th Ctrl Delay		31.3	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	535	740	548	469	0	0	0	0	493	0	140
Future Volume (veh/h)	0	535	740	548	469	0	0	0	0	493	0	140
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1767	1767	0				1767	0	1767
Adj Flow Rate, veh/h	0	582	600	596	510	0				536	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	5	5	9	9	0				9	0	9
Cap, veh/h	0	833	727	762	2506	0				609	0	273
Arrive On Green	0.00	0.48	0.48	0.39	1.00	0.00				0.19	0.00	0.18
Sat Flow, veh/h	0	1826	1515	3264	3445	0				3264	0	1497
Grp Volume(v), veh/h	0	582	600	596	510	0				536	0	7
Grp Sat Flow(s),veh/h/ln	0	1735	1515	1632	1678	0				1632	0	1497
Q Serve(g_s), s	0.0	31.5	41.0	19.2	0.0	0.0				19.2	0.0	0.5
Cycle Q Clear(g_c), s	0.0	31.5	41.0	19.2	0.0	0.0				19.2	0.0	0.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	833	727	762	2506	0				609	0	273
V/C Ratio(X)	0.00	0.70	0.82	0.78	0.20	0.00				0.88	0.00	0.03
Avail Cap(c_a), veh/h	0	833	727	762	2506	0				680	0	306
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.73	0.73	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.4	27.1	33.9	0.0	0.0				47.5	0.0	40.3
Incr Delay (d2), s/veh	0.0	4.8	10.3	5.9	0.1	0.0				11.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.4	16.1	6.9	0.0	0.0				8.6	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.3	37.4	39.8	0.1	0.0				59.4	0.0	40.3
LnGrp LOS	A	C	D	D	A	A				E	A	D
Approach Vol, veh/h		1182			1106						543	
Approach Delay, s/veh		33.4			21.5						59.1	
Approach LOS		C			C						E	

Timer - Assigned Phs		2		4	5	6						
Phs Duration (G+Y+Rc), s		93.6		26.4	32.0	61.6						
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5						
Max Green Setting (Gmax), s		86.5		24.5	27.5	54.5						
Max Q Clear Time (g_c+I1), s		2.0		21.2	21.2	43.0						
Green Ext Time (p_c), s		3.6		0.7	1.3	5.9						

Intersection Summary												
HCM 6th Ctrl Delay			33.7									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	938	0	0	807	463	210	0	639	0	0	0
Future Volume (veh/h)	90	938	0	0	807	463	210	0	639	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	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	1796	1796	0	0	1767	1767	1781	0	1781			
Adj Flow Rate, veh/h	95	987	0	0	849	169	221	0	642			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	7	7	0	0	9	9	8	0	8			
Cap, veh/h	127	1653	0	0	1265	556	762	0	671			
Arrive On Green	0.15	0.97	0.00	0.00	0.38	0.37	0.45	0.00	0.44			
Sat Flow, veh/h	1711	3503	0	0	3445	1493	1697	0	1510			
Grp Volume(v), veh/h	95	987	0	0	849	169	221	0	642			
Grp Sat Flow(s),veh/h/ln	1711	1706	0	0	1678	1493	1697	0	1510			
Q Serve(g_s), s	6.4	2.6	0.0	0.0	25.3	9.6	9.9	0.0	49.3			
Cycle Q Clear(g_c), s	6.4	2.6	0.0	0.0	25.3	9.6	9.9	0.0	49.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	127	1653	0	0	1265	556	762	0	671			
V/C Ratio(X)	0.75	0.60	0.00	0.00	0.67	0.30	0.29	0.00	0.96			
Avail Cap(c_a), veh/h	150	1653	0	0	1265	556	834	0	736			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.44	0.44	0.00	0.00	0.89	0.89	1.00	0.00	1.00			
Uniform Delay (d), s/veh	50.0	1.0	0.0	0.0	31.2	26.6	21.0	0.0	32.2			
Incr Delay (d2), s/veh	7.4	0.7	0.0	0.0	2.5	1.3	0.2	0.0	22.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.8	0.6	0.0	0.0	10.3	3.5	3.9	0.0	21.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.4	1.7	0.0	0.0	33.7	27.9	21.2	0.0	54.3			
LnGrp LOS	E	A	A	A	C	C	C	A	D			
Approach Vol, veh/h		1082			1018			863				
Approach Delay, s/veh		6.6			32.8			45.8				
Approach LOS		A			C			D				

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	12.9	49.2		57.9		62.1			
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s	10.0	38.0		58.5		52.5			
Max Q Clear Time (g_c+I1), s	8.4	27.3		51.3		4.6			
Green Ext Time (p_c), s	0.0	4.5		2.1		8.3			

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

MOVEMENT SUMMARY

Site: 5 [9th St/Golden State Blvd at Nunes Rd - PM Peak]

Cumulative plus Project Trips Combined with Mitigations
PM Peak Hour
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Golden State Blvd											
1	L2	175	6.0	0.476	9.7	LOS A	2.5	18.6	0.41	0.29	48.0
2	T1	211	6.0	0.476	9.7	LOS A	2.5	18.6	0.41	0.29	49.1
3	R2	60	6.0	0.476	9.7	LOS A	2.5	18.6	0.41	0.29	49.0
Approach		446	6.0	0.476	9.7	LOS A	2.5	18.6	0.41	0.29	48.6
East: Nunes Rd											
4	L2	198	2.0	0.505	13.8	LOS B	2.6	18.5	0.67	0.72	45.6
5	T1	69	2.0	0.505	13.8	LOS B	2.6	18.5	0.67	0.72	46.5
6	R2	57	2.0	0.505	13.8	LOS B	2.6	18.5	0.67	0.72	46.5
Approach		324	2.0	0.505	13.8	LOS B	2.6	18.5	0.67	0.72	45.9
North: 9th St											
7	L2	46	2.0	0.502	10.9	LOS B	2.7	19.5	0.54	0.47	47.6
8	T1	362	2.0	0.502	10.9	LOS B	2.7	19.5	0.54	0.47	48.6
9	R2	23	2.0	0.502	10.9	LOS B	2.7	19.5	0.54	0.47	48.6
Approach		431	2.0	0.502	10.9	LOS B	2.7	19.5	0.54	0.47	48.5
West: Nunes Rd											
10	L2	11	10.0	0.259	7.7	LOS A	1.0	7.4	0.46	0.41	47.5
11	T1	34	10.0	0.259	7.7	LOS A	1.0	7.4	0.46	0.41	48.5
12	R2	152	10.0	0.259	7.7	LOS A	1.0	7.4	0.46	0.41	48.4
Approach		198	10.0	0.259	7.7	LOS A	1.0	7.4	0.46	0.41	48.4
All Vehicles		1399	4.4	0.505	10.7	LOS B	2.7	19.5	0.52	0.46	47.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	624	675	278	122	374	63	233	146	127	92	165	663
Future Volume (veh/h)	624	675	278	122	374	63	233	146	127	92	165	663
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	650	703	211	127	390	36	243	152	38	96	172	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	6	6	6	4	4	4
Cap, veh/h	688	2274	1026	154	1724	781	272	410	194	119	255	
Arrive On Green	0.35	1.00	1.00	0.05	0.51	0.51	0.08	0.12	0.13	0.03	0.07	0.00
Sat Flow, veh/h	3319	3413	1522	3319	3413	1521	3346	3441	1524	3401	3497	1560
Grp Volume(v), veh/h	650	703	211	127	390	36	243	152	38	96	172	0
Grp Sat Flow(s),veh/h/ln	1659	1706	1522	1659	1706	1521	1673	1721	1524	1700	1749	1560
Q Serve(g_s), s	22.8	0.0	0.0	4.6	7.7	1.4	8.6	4.9	2.7	3.4	5.8	0.0
Cycle Q Clear(g_c), s	22.8	0.0	0.0	4.6	7.7	1.4	8.6	4.9	2.7	3.4	5.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	688	2274	1026	154	1724	781	272	410	194	119	255	
V/C Ratio(X)	0.94	0.31	0.21	0.83	0.23	0.05	0.89	0.37	0.20	0.81	0.67	
Avail Cap(c_a), veh/h	774	2274	1026	249	1724	781	307	1090	495	198	991	
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.5	0.0	0.0	56.7	16.6	14.5	54.6	48.7	46.8	57.5	54.2	0.0
Incr Delay (d2), s/veh	12.8	0.2	0.3	11.3	0.3	0.1	24.8	0.6	0.5	12.1	3.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	0.1	0.1	2.1	3.0	0.5	4.5	2.1	1.0	1.6	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	0.2	0.3	68.0	16.9	14.7	79.4	49.3	47.3	69.6	57.3	0.0
LnGrp LOS	D	A	A	E	B	B	E	D	D	E	E	
Approach Vol, veh/h		1564			553			433			268	A
Approach Delay, s/veh		21.4			28.5			66.0			61.7	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.9	64.6	8.2	18.3	9.6	83.9	13.7	12.8
Change Period (Y+Rc), s	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Max Green Setting (Gmax), s	29.0	32.0	8.0	39.0	10.0	51.0	12.0	35.0
Max Q Clear Time (g_c+I1), s	24.8	9.7	5.4	6.9	6.6	2.0	10.6	7.8
Green Ext Time (p_c), s	1.1	2.5	0.1	1.0	0.1	6.1	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	804	489	90	60	70
Future Vol, veh/h	90	804	489	90	60	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	95	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	8	8	8	1	1
Mvmt Flow	96	855	520	96	64	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	520	0	-	0	1567	520
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	1047	-
Critical Hdwy	4.18	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.272	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1016	-	-	0	123	558
Stage 1	-	-	-	0	599	-
Stage 2	-	-	-	0	339	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1016	-	-	-	111	558
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	339	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1016	-	-	516
HCM Lane V/C Ratio	0.094	-	-	0.268
HCM Control Delay (s)	8.9	-	-	14.5
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	1.1

Appendix C:
Peak Hour Signal Warrants



FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 SB Off-ramp	Scenario	Existing
		Peak Hour	AM

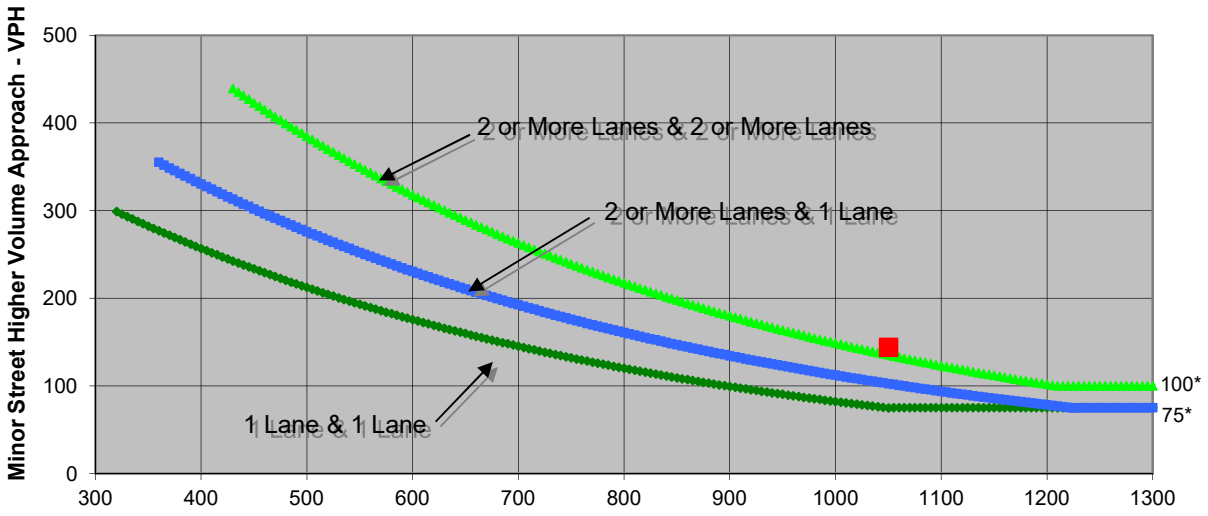
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	92	0	241
Through	0	0	188	428
Right	0	52	193	0
Total	0	144	381	669

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	SR 99 SB Off-ramp	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,050**	**144**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 SB Off-ramp	Scenario	Existing
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	92	0	241
Through	0	0	188	428
Right	0	52	193	0
Total	0	144	381	669

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	102.1
Approach with Worst Case Delay	SB
Total Vehicles on Approach	144

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing	**4.1**	**144**	**1,194**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 SB Off-ramp	Scenario	Existing
		Peak Hour	PM

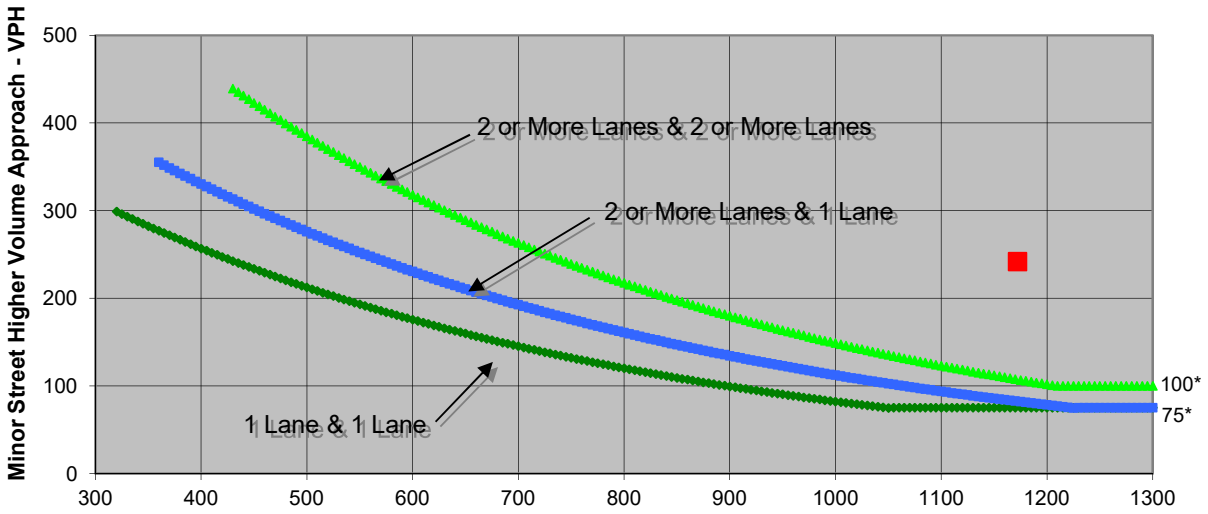
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	159	0	194
Through	0	2	297	256
Right	0	81	425	0
Total	0	242	722	450

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	SR 99 SB Off-ramp	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,172**	**242**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 SB Off-ramp	Scenario	Existing
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	159	0	194
Through	0	2	297	256
Right	0	81	425	0
Total	0	242	722	450

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	259.1
Approach with Worst Case Delay	SB
Total Vehicles on Approach	242

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing	**17.4**	**242**	**1,414**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 NB Off-ramp	Scenario	Existing
		Peak Hour	AM

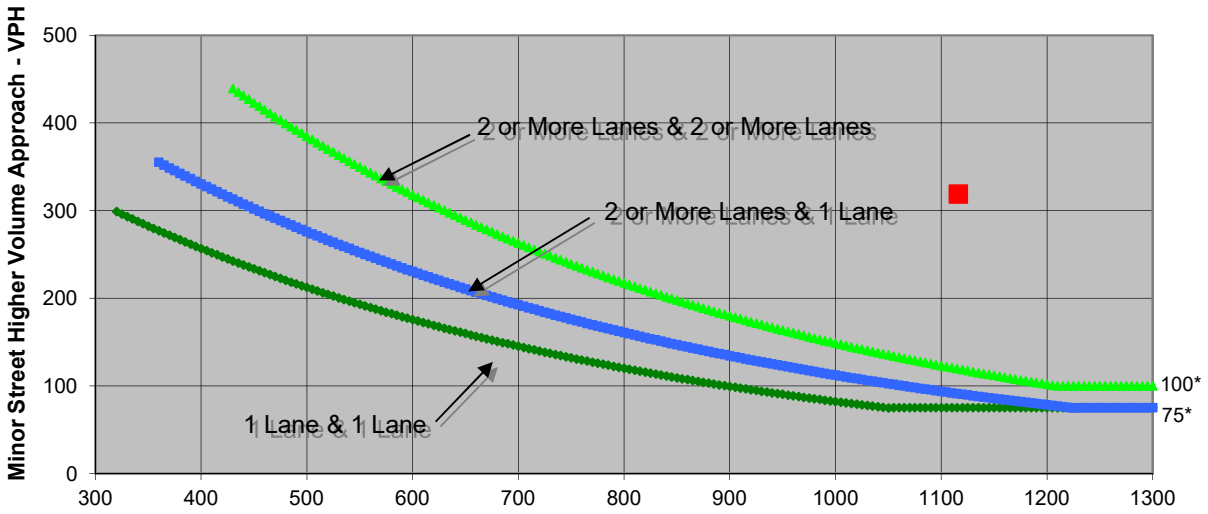
Turn Movement Volumes

	NB	SB	EB	WB
Left	148	0	52	0
Through	0	0	228	521
Right	171	0	0	315
Total	319	0	280	836

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	SR 99 NB Off-ramp	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,116**	**319**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 NB Off-ramp	Scenario	Existing
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	148	0	52	0
Through	0	0	228	521
Right	171	0	0	315
Total	319	0	280	836

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	70.4
Approach with Worst Case Delay	NB
Total Vehicles on Approach	319

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing	**6.2**	**319**	**1,435**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 NB Off-ramp	Scenario	Existing
		Peak Hour	PM

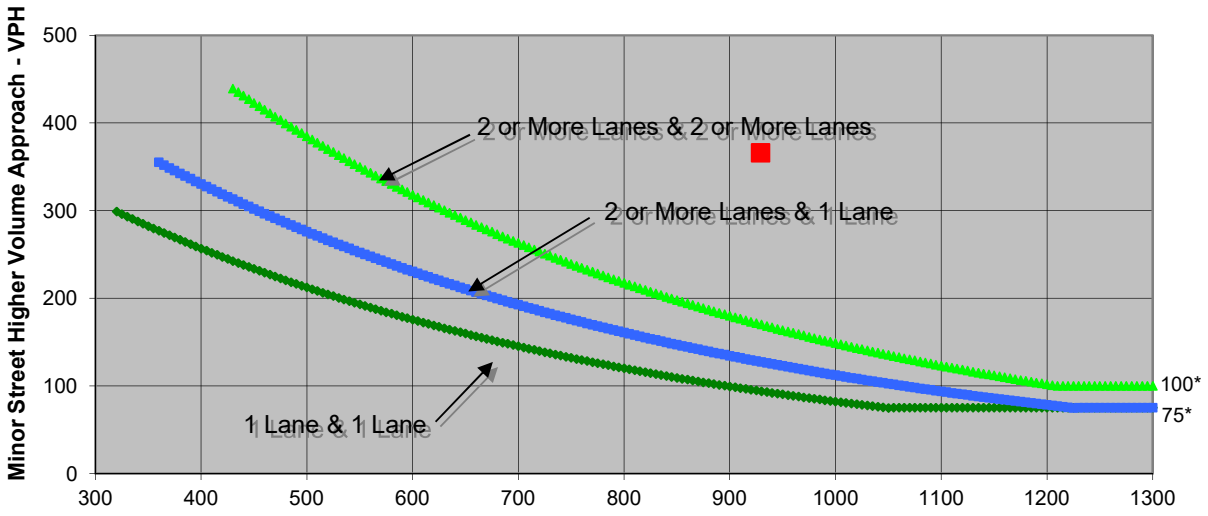
Turn Movement Volumes

	NB	SB	EB	WB
Left	119	0	49	0
Through	0	0	407	331
Right	247	0	0	142
Total	366	0	456	473

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	SR 99 NB Off-ramp	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**929**	**366**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	SR 99 NB Off-ramp	Scenario	Existing
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	119	0	49	0
Through	0	0	407	331
Right	247	0	0	142
Total	366	0	456	473

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	52.2
Approach with Worst Case Delay	NB
Total Vehicles on Approach	366

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
Existing	**5.3**	**366**	**1,295**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR & PEERS

Major Street	Golden State Blvd	Project	Keyes Community Plan Area TIA
Minor Street	NRTP (South) Driveway	Scenario	EX with Nunes Rd. Travel Plaza
		Peak Hour	AM

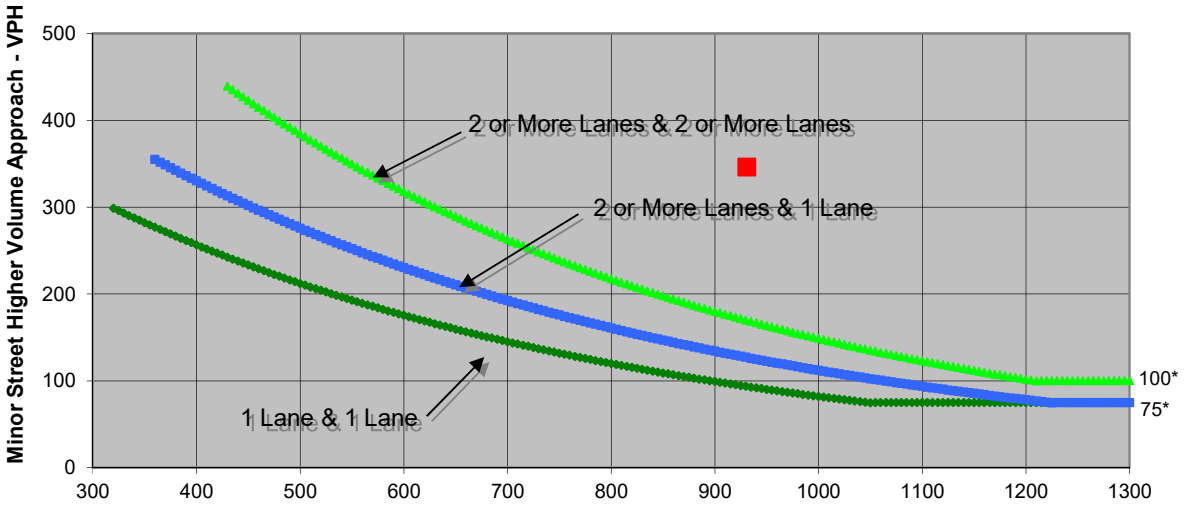
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	0	320
Through	225	360	0	0
Right	320	26	0	26
Total	545	386	0	346

Major Street Direction

x	North/South
	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Golden State Blvd	NRTP (South) Driveway	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**931**	**346**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Keyes Community Plan Area TIA
Scenario	EX with Nunes Rd. Travel Plaza
Peak Hour	AM

Major Street	Golden State Blvd
Minor Street	NRTP (South) Driveway

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	0	320
Through	225	360	0	0
Right	320	26	0	26
Total	545	386	0	346

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	136.6
Approach with Worst Case Delay	WB
Total Vehicles on Approach	346

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
EX with Nunes Rd. Travel Plaza	**13.1**	**346**	**1,277**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Keyes Road
Minor Street	Foote Road

Project	Keyes Community Plan Area TIA
Scenario	EX with Project Trips Combined
Peak Hour	AM

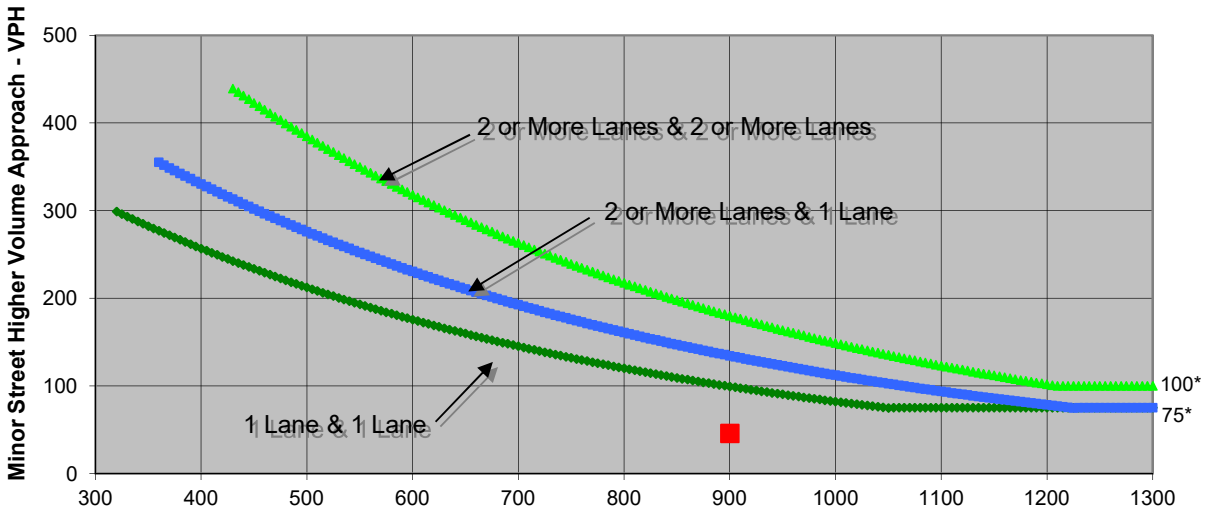
Turn Movement Volumes

	NB	SB	EB	WB
Left	26	2	0	20
Through	0	1	388	484
Right	20	0	6	2
Total	46	3	394	506

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Foote Road	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**900**	**46**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Foote Road	Scenario	EX with Project Trips Combined
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	26	2	0	20
Through	0	1	388	484
Right	20	0	6	2
Total	46	3	394	506

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	29.1
Approach with Worst Case Delay	SB
Total Vehicles on Approach	3

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
EX with Project Trips Combined	**0**	**46**	**949**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Foote Road	Scenario	EX with Project Trips Combined
		Peak Hour	PM

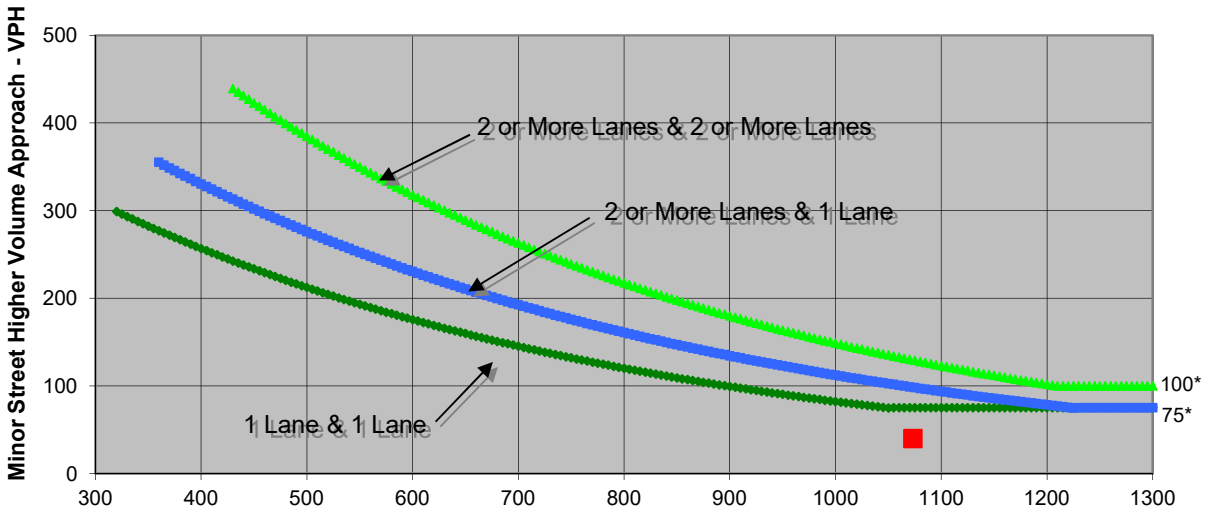
Turn Movement Volumes

	NB	SB	EB	WB
Left	11	9	1	43
Through	0	0	699	303
Right	29	2	17	10
Total	40	11	717	356

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Foote Road	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**1,073**	**40**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Foote Road	Scenario	EX with Project Trips Combined
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	11	9	1	43
Through	0	0	699	303
Right	29	2	17	10
Total	40	11	717	356

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	27.9
Approach with Worst Case Delay	SB
Total Vehicles on Approach	11

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
EX with Project Trips Combined	**0.1**	**40**	**1,124**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Golden State Blvd	Project	Keyes Community Plan Area TIA
Minor Street	KI (South) Driveway	Scenario	EX with Project Trips Combined
		Peak Hour	AM

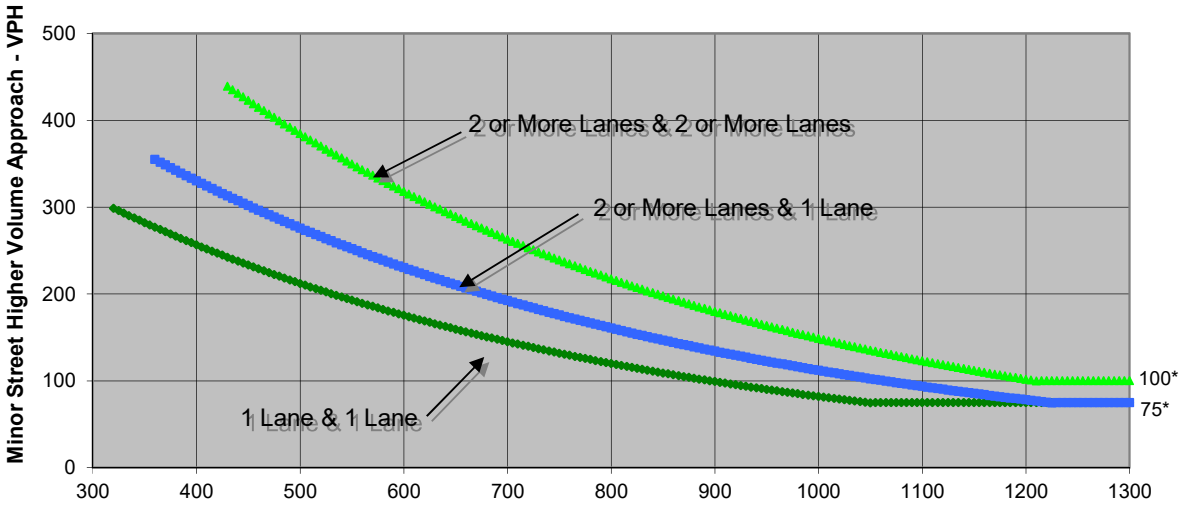
Turn Movement Volumes

	NB	SB	EB	WB
Left	265	0	21	0
Through	556	695	0	0
Right	0	21	252	0
Total	821	716	273	0

Major Street Direction

x	North/South
	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Golden State Blvd	KI (South) Driveway	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,537**	**273**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Keyes Community Plan Area TIA
Scenario	EX with Project Trips Combined
Peak Hour	AM

Major Street	Golden State Blvd
Minor Street	KI (South) Driveway

Turn Movement Volumes

	NB	SB	EB	WB
Left	265	0	21	0
Through	556	695	0	0
Right	0	21	252	0
Total	821	716	273	0

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	229
Approach with Worst Case Delay	EB
Total Vehicles on Approach	273

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
EX with Project Trips Combined	**17.4**	**273**	**1,810**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Met**	**Met**
Warrant Met	**YES**		

FEHR PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Foote Road	Scenario	CU with Project Trips Combined
		Peak Hour	AM

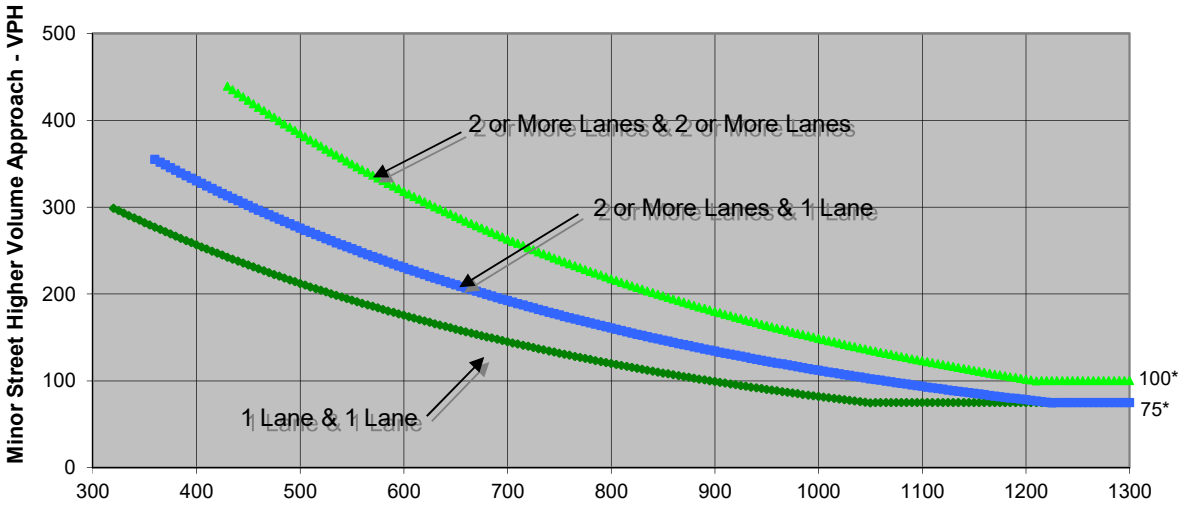
Turn Movement Volumes

	NB	SB	EB	WB
Left	50	10	0	40
Through	0	10	649	816
Right	40	0	10	10
Total	90	20	659	866

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Foote Road	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,525**	**90**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road
Minor Street	Foote Road

Project	Keyes Community Plan Area TIA
Scenario	CU with Project Trips Combined
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	50	10	0	40
Through	0	10	649	816
Right	40	0	10	10
Total	90	20	659	866

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	290.7
Approach with Worst Case Delay	NB
Total Vehicles on Approach	90

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**7.3**	**90**	**1,635**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Foote Road	Scenario	CU with Project Trips Combined
		Peak Hour	PM

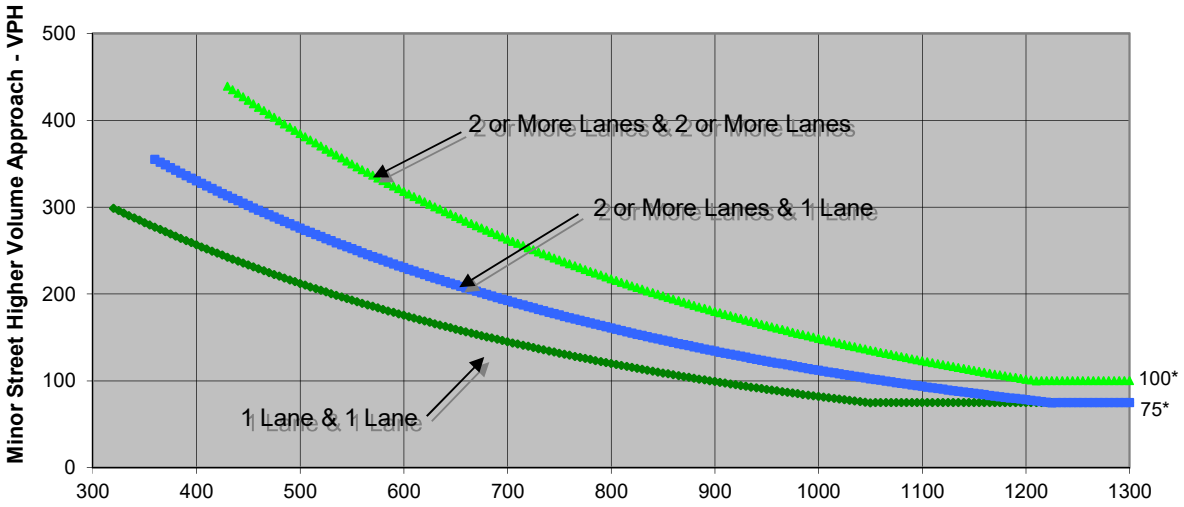
Turn Movement Volumes

	NB	SB	EB	WB
Left	20	20	10	80
Through	0	0	1,205	509
Right	50	10	30	20
Total	70	30	1,245	609

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Foote Road	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**1,854**	**70**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road
Minor Street	Foote Road

Project	Keyes Community Plan Area TIA
Scenario	CU with Project Trips Combined
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	20	10	80
Through	0	0	1,205	509
Right	50	10	30	20
Total	70	30	1,245	609

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	349
Approach with Worst Case Delay	SB
Total Vehicles on Approach	30

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**2.9**	**70**	**1,954**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Golden State Blvd	Project	Keyes Community Plan Area TIA
Minor Street	Nunes Road	Scenario	CU with Project Trips Combined
		Peak Hour	AM

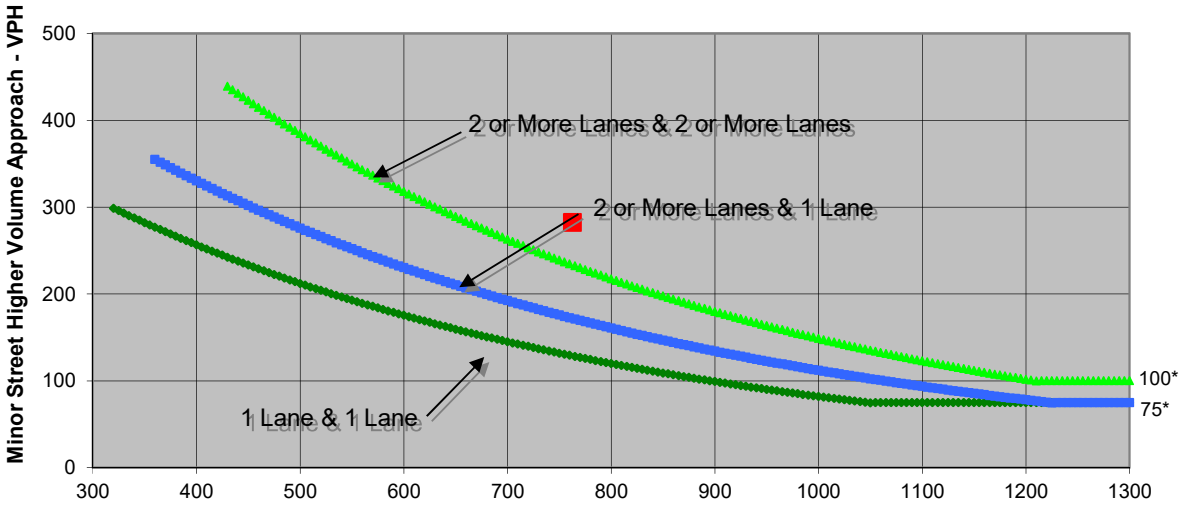
Turn Movement Volumes

	NB	SB	EB	WB
Left	152	40	10	172
Through	184	315	30	60
Right	52	20	132	50
Total	388	375	172	282

Major Street Direction

x	North/South
	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Golden State Blvd	Nunes Road	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**763**	**282**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Keyes Community Plan Area TIA
Scenario	CU with Project Trips Combined
Peak Hour	AM

Major Street	Golden State Blvd
Minor Street	Nunes Road

Turn Movement Volumes

	NB	SB	EB	WB
Left	152	40	10	172
Through	184	315	30	60
Right	52	20	132	50
Total	388	375	172	282

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	29
Approach with Worst Case Delay	WB
Total Vehicles on Approach	282

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**2.3**	**282**	**1,217**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Nunes Road	Scenario	CU with Project Trips Combined
		Peak Hour	AM

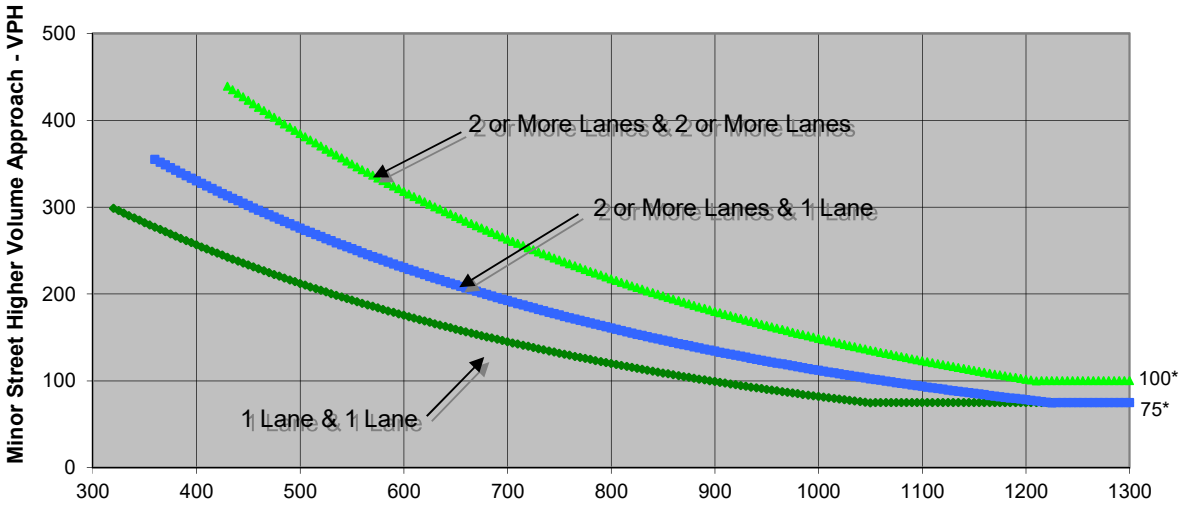
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	70	80	0
Through	0	0	513	805
Right	0	50	0	110
Total	0	120	593	915

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Nunes Road	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,508**	**120**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Keyes Road
Minor Street	Nunes Road

Project	Keyes Community Plan Area TIA
Scenario	CU with Project Trips Combined
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	70	80	0
Through	0	0	513	805
Right	0	50	0	110
Total	0	120	593	915

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	51.5
Approach with Worst Case Delay	SB
Total Vehicles on Approach	120

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**1.7**	**120**	**1,628**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Keyes Road	Project	Keyes Community Plan Area TIA
Minor Street	Nunes Road	Scenario	CU with Project Trips Combined
		Peak Hour	PM

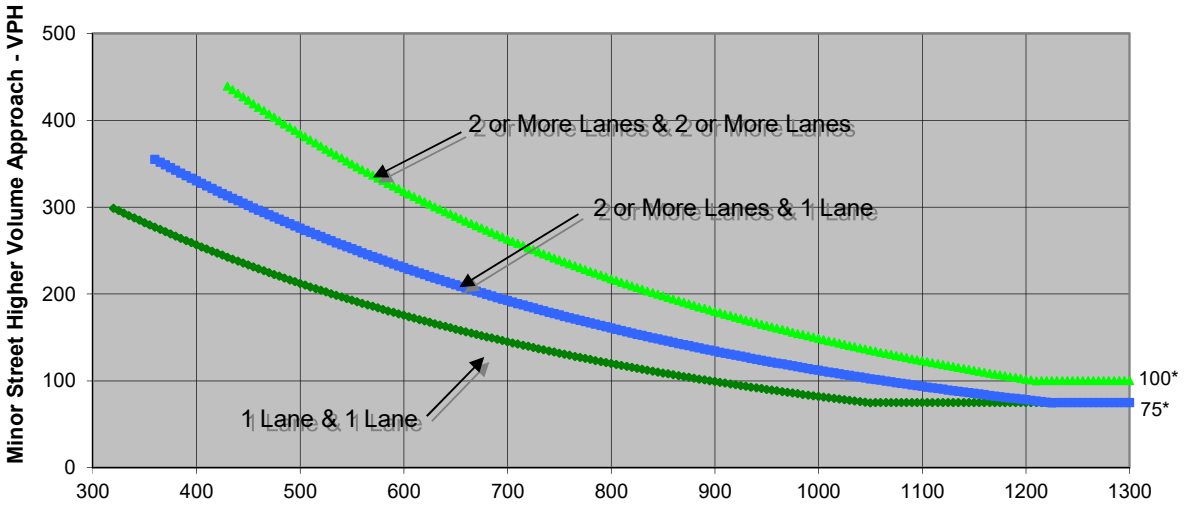
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	90	0
Through	0	0	804	489
Right	0	70	0	90
Total	0	130	894	579

Major Street Direction

	North/South
x	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Keyes Road	Nunes Road	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**1,473**	**130**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Project	Keyes Community Plan Area TIA
Scenario	CU with Project Trips Combined
Peak Hour	PM

Major Street	Keyes Road
Minor Street	Nunes Road

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	60	90	0
Through	0	0	804	489
Right	0	70	0	90
Total	0	130	894	579

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	38.3
Approach with Worst Case Delay	SB
Total Vehicles on Approach	130

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**1.4**	**130**	**1,603**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

Major Street	Golden State Blvd	Project	Keyes Community Plan Area TIA
Minor Street	KI (Middle)/NRTP (North) Driveways	Scenario	CU with Project Trips Combined
		Peak Hour	AM

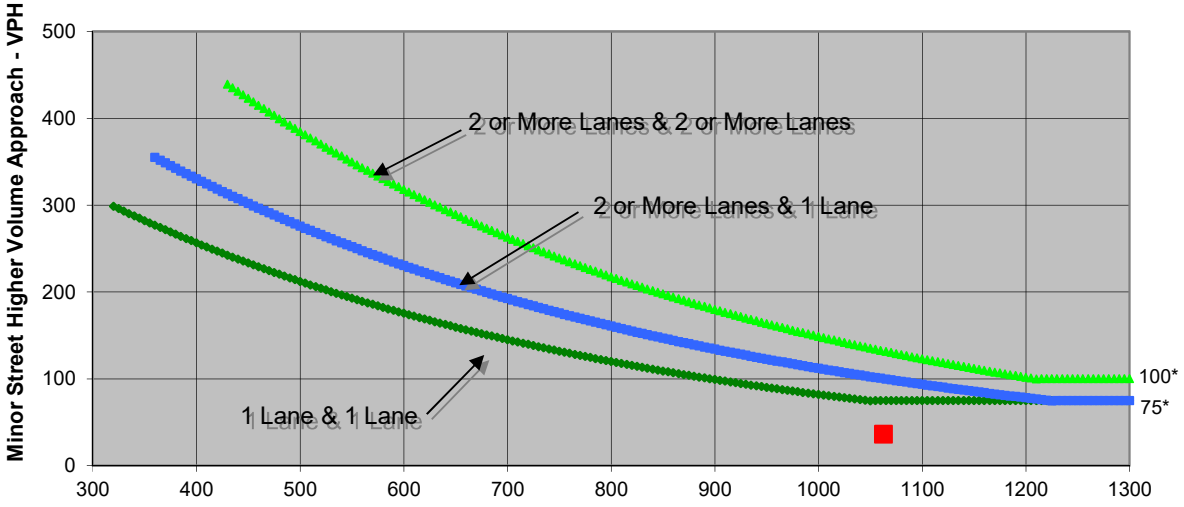
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	2	1	34
Through	414	613	0	0
Right	34	0	35	2
Total	448	615	36	36

Major Street Direction

x	North/South
	East/West

Figure 4C-4. Warrant 3B, Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET



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

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Golden State Blvd	KI (Middle)/NRTP (North) Driveways	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**1,063**	**36**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Golden State Blvd	Project	Keyes Community Plan Area TIA
Minor Street	KI (Middle)/NRTP (North) Driveways	Scenario	CU with Project Trips Combined
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	2	1	34
Through	414	613	0	0
Right	34	0	35	2
Total	448	615	36	36

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	33.5
Approach with Worst Case Delay	WB
Total Vehicles on Approach	36

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	**Peak Hour Volume on Minor Approach (vph)**	**Peak Hour Entering Volume Serviced (vph)**
CU with Project Trips Combined	**0.3**	**36**	**1,135**
Limiting Value	**4**	**100**	**800**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

Appendix D:
Freeway Mainline & Ramp Junction Operation Worksheets



HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4952	319
Peak Hour Factor (PHF)	0.87	0.84
Total Trucks, %	8.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.847
Flow Rate (vi),pc/h	6147	448
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.85	0.22

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3130	Speed Index (DS)	0.468
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	2359
Distance to Downstream Ramp (LDOWN), ft	2780	Off-Ramp Influence Area Speed (SR), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.586	Outer Lanes Freeway Speed (SO), mi/h	71.5
Flow in Lanes 1 and 2 (v12), pc/h	3788	Ramp Junction Speed (S), mi/h	61.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	33.2
Level of Service (LOS)	E	Density in Ramp Influence Area (DR), pc/mi/ln	35.3

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HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4825	366
Peak Hour Factor (PHF)	0.98	0.93
Total Trucks, %	7.00	7.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.935
Flow Rate (vi),pc/h	5266	421
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.73	0.21

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3130	Speed Index (DS)	0.466
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	1894
Distance to Downstream Ramp (LDOWN), ft	2780	Off-Ramp Influence Area Speed (SR), mi/h	57.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.609	Outer Lanes Freeway Speed (SO), mi/h	73.3
Flow in Lanes 1 and 2 (v12), pc/h	3372	Ramp Junction Speed (S), mi/h	62.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	28.3
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	31.7

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4633	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.87	Flow Rate (V_p), pc/h/ln	1917
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	30.5
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4459	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor	0.98	Flow Rate (V_p), pc/h/ln	1622
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	24.5
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4633	367
Peak Hour Factor (PHF)	0.87	0.83
Total Trucks, %	8.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.909
Flow Rate (vi),pc/h	5751	486
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.87	0.24

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1073.7	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	0.468
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2318
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	63.4
Flow in Lanes 1 and 2 (v12), pc/h	3433	Ramp Junction Speed (S), mi/h	59.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	3919	Average Density (D), pc/mi/ln	35.1
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	31.5

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HCS7 Freeway Merge Report

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Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4459	191
Peak Hour Factor (PHF)	0.98	0.88
Total Trucks, %	7.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.909
Flow Rate (vi),pc/h	4866	239
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.71	0.12

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	831.5	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	0.362
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	1961
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	59.9
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	64.7
Flow in Lanes 1 and 2 (v12), pc/h	2905	Ramp Junction Speed (S), mi/h	61.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	3144	Average Density (D), pc/mi/ln	27.6
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	25.6

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HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	3840	144
Peak Hour Factor (PHF)	0.82	0.88
Total Trucks, %	11.00	22.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.820
Flow Rate (vi),pc/h	5197	200
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.72	0.10

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	10800	Speed Index (DS)	0.446
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	1894
Distance to Downstream Ramp (LDOWN), ft	3480	Off-Ramp Influence Area Speed (SR), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.621	Outer Lanes Freeway Speed (SO), mi/h	73.3
Flow in Lanes 1 and 2 (v12), pc/h	3303	Ramp Junction Speed (S), mi/h	62.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	27.8
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	30.6

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HCS7 Freeway Diverge Report

Project Information

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Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi)	5030	242
Peak Hour Factor (PHF)	0.78	0.92
Total Trucks, %	8.00	9.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.917
Flow Rate (vi),pc/h	6964	287
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.97	0.14

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	10800	Speed Index (DS)	0.454
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	3480	Off-Ramp Influence Area Speed (SR), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.573	Outer Lanes Freeway Speed (SO), mi/h	70.2
Flow in Lanes 1 and 2 (v12), pc/h	4264	Ramp Junction Speed (S), mi/h	61.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	37.6
Level of Service (LOS)	E	Density in Ramp Influence Area (DR), pc/mi/ln	38.9

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HCS7 Basic Freeway Report

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Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3696	Heavy Vehicle Adjustment Factor (f_{HV})	0.901
Peak Hour Factor	0.82	Flow Rate (V_p), pc/h/ln	1668
Total Trucks, %	11.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.70
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	25.3
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

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Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4788	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.78	Flow Rate (V_p), pc/h/ln	2210
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.93
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	38.8
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	3696	434
Peak Hour Factor (PHF)	0.82	0.94
Total Trucks, %	11.00	17.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.855
Flow Rate (vi),pc/h	5003	540
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.77	0.27

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	925.2	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	0.405
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2016
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	58.7
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	64.5
Flow in Lanes 1 and 2 (v12), pc/h	2987	Ramp Junction Speed (S), mi/h	60.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	3527	Average Density (D), pc/mi/ln	30.4
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	28.4

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4788	619
Peak Hour Factor (PHF)	0.78	0.93
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.952
Flow Rate (vi),pc/h	6629	699
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.02	0.35

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1307.2	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2671
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	50.9
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	3958	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4657	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	37.2

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HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	4997	517
Peak Hour Factor (PHF)	0.87	0.84
Total Trucks, %	8.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.847
Flow Rate (v_i),pc/h	6203	727
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.86	0.36

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	3130	Speed Index (D_S)	0.493
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	2349
Distance to Downstream Ramp (L_{DOWN}), ft	2780	Off-Ramp Influence Area Speed (S_R), mi/h	56.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.571	Outer Lanes Freeway Speed (S_O), mi/h	71.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	3854	Ramp Junction Speed (S), mi/h	61.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.8
Level of Service (LOS)	E	Density in Ramp Influence Area (D_R), pc/mi/ln	35.8

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	4851	575
Peak Hour Factor (PHF)	0.98	0.93
Total Trucks, %	7.00	7.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.935	0.935
Flow Rate (v_i),pc/h	5294	661
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.74	0.33

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	3130	Speed Index (D_S)	0.487
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	1867
Distance to Downstream Ramp (L_{DOWN}), ft	2780	Off-Ramp Influence Area Speed (S_R), mi/h	56.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.597	Outer Lanes Freeway Speed (S_O), mi/h	73.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	3427	Ramp Junction Speed (S), mi/h	61.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	28.7
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	32.1

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4480	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.87	Flow Rate (V_p), pc/h/ln	1854
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.78
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	63.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	29.1
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4276	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor	0.98	Flow Rate (V_p), pc/h/ln	1556
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	23.3
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4480	565
Peak Hour Factor (PHF)	0.87	0.83
Total Trucks, %	8.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.909
Flow Rate (vi),pc/h	5561	749
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.88	0.37

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1089.3	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	0.500
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2241
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	56.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	63.7
Flow in Lanes 1 and 2 (v12), pc/h	3320	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	4069	Average Density (D), pc/mi/ln	36.0
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	32.6

HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4480	565
Peak Hour Factor (PHF)	0.87	0.83
Total Trucks, %	8.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.909
Flow Rate (vi),pc/h	5561	749
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.88	0.37

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1089.3	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	0.500
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2241
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	56.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	63.7
Flow in Lanes 1 and 2 (v12), pc/h	3320	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	4069	Average Density (D), pc/mi/ln	36.0
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	32.6

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	3893	350
Peak Hour Factor (PHF)	0.82	0.88
Total Trucks, %	11.00	22.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.901	0.820
Flow Rate (v_i),pc/h	5269	485
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.73	0.24

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	10800	Speed Index (D_S)	0.472
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	1885
Distance to Downstream Ramp (L_{DOWN}), ft	3480	Off-Ramp Influence Area Speed (S_R), mi/h	56.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.606	Outer Lanes Freeway Speed (S_O), mi/h	73.3
Flow in Lanes 1 and 2 (v_{12}), pc/h	3384	Ramp Junction Speed (S), mi/h	61.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	28.4
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	31.3

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	5060	455
Peak Hour Factor (PHF)	0.78	0.92
Total Trucks, %	8.00	9.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.917
Flow Rate (v_i),pc/h	7006	539
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.97	0.27

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	10800	Speed Index (D_S)	0.477
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	3480	Off-Ramp Influence Area Speed (S_R), mi/h	56.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.560	Outer Lanes Freeway Speed (S_O), mi/h	70.2
Flow in Lanes 1 and 2 (v_{12}), pc/h	4306	Ramp Junction Speed (S), mi/h	61.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.2
Level of Service (LOS)	E	Density in Ramp Influence Area (D_R), pc/mi/ln	39.3

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3543	Heavy Vehicle Adjustment Factor (f_{HV})	0.901
Peak Hour Factor	0.82	Flow Rate (V_p), pc/h/ln	1598
Total Trucks, %	11.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	24.0
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

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Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	4605	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.78	Flow Rate (V_p), pc/h/ln	2125
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	58.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	36.1
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Existing with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	3543	624
Peak Hour Factor (PHF)	0.82	0.94
Total Trucks, %	11.00	17.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.855
Flow Rate (vi),pc/h	4795	776
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	0.77	0.39

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	931.2	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	0.420
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	1932
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	58.2
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	64.8
Flow in Lanes 1 and 2 (v12), pc/h	2863	Ramp Junction Speed (S), mi/h	60.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	3639	Average Density (D), pc/mi/ln	30.8
Level of Service (LOS)	D	Density in Ramp Influence Area (DR), pc/mi/ln	29.2

HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Existing with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	4605	827
Peak Hour Factor (PHF)	0.78	0.93
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.952
Flow Rate (vi),pc/h	6376	934
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.02	0.47

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1303.3	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2570
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	49.9
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	3806	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4740	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	37.7

HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i)	7020	560
Peak Hour Factor (PHF)	0.87	0.84
Total Trucks, %	8.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.847
Flow Rate (v_i),pc/h	8714	787
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.21	0.39

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	3130	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	0.0	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	2780	Off-Ramp Influence Area Speed (S_R), mi/h	56.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.506	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	6014	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	6014	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	54.4

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HCS7 Freeway Diverge Report

Project Information			
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Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	6900	640
Peak Hour Factor (PHF)	0.98	0.93
Total Trucks, %	7.00	7.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.935
Flow Rate (vi),pc/h	7530	736
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.05	0.37

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3130	Speed Index (DS)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2780	Off-Ramp Influence Area Speed (SR), mi/h	56.2
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.538	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	4830	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	44.2

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6460	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.87	Flow Rate (V_p), pc/h/ln	2673
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.12
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6260	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor	0.98	Flow Rate (V_p), pc/h/ln	2277
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.96
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	55.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	41.1
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	6460	640
Peak Hour Factor (PHF)	0.87	0.83
Total Trucks, %	8.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.909
Flow Rate (vi),pc/h	8019	848
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.23	0.42

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1636.5	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	10.3
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	5319	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	6167	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	48.9

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HCS7 Freeway Merge Report

Project Information			
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Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	6260	340
Peak Hour Factor (PHF)	0.98	0.88
Total Trucks, %	7.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.935	0.909
Flow Rate (vi),pc/h	6832	425
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.01	0.21

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1292.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	52.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	4132	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4557	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	36.5

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HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	5500	250
Peak Hour Factor (PHF)	0.82	0.88
Total Trucks, %	11.00	22.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.820
Flow Rate (vi),pc/h	7444	346
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.03	0.17

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	10800	Speed Index (DS)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	3480	Off-Ramp Influence Area Speed (SR), mi/h	57.1
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.558	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	4744	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	43.0

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HCS7 Freeway Diverge Report

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Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i)	7100	420
Peak Hour Factor (PHF)	0.78	0.92
Total Trucks, %	8.00	9.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.917
Flow Rate (v_i),pc/h	9830	498
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.37	0.25

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	10800	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	3480	Off-Ramp Influence Area Speed (S_R), mi/h	56.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.491	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	7130	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	63.5

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HCS7 Basic Freeway Report

Project Information

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Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	5250	Heavy Vehicle Adjustment Factor (f_{HV})	0.901
Peak Hour Factor	0.82	Flow Rate (V_p), pc/h/ln	2369
Total Trucks, %	11.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.00
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	53.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	44.7
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

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Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6680	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.78	Flow Rate (V_p), pc/h/ln	3083
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	5250	760
Peak Hour Factor (PHF)	0.82	0.94
Total Trucks, %	11.00	17.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.855
Flow Rate (vi),pc/h	7106	946
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.12	0.47

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1462.1	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	39.3
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	4406	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	5352	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	42.5

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HCS7 Freeway Merge Report

Project Information			
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Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	6680	1080
Peak Hour Factor (PHF)	0.78	0.93
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.952
Flow Rate (vi),pc/h	9248	1220
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.45	0.61

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1979.2	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	0.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	6548	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	7768	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	61.2

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HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi)	7065	758
Peak Hour Factor (PHF)	0.87	0.84
Total Trucks, %	8.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.847
Flow Rate (vi),pc/h	8770	1065
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.22	0.53

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	0.0	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3130	Speed Index (DS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2780	Off-Ramp Influence Area Speed (SR), mi/h	55.3
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	0.492	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	6070	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	6070	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	54.9

HCS7 Freeway Diverge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	175
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i)	6926	849
Peak Hour Factor (PHF)	0.98	0.93
Total Trucks, %	7.00	7.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.935	0.935
Flow Rate (v_i),pc/h	7559	976
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.05	0.49

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	3130	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	2780	Off-Ramp Influence Area Speed (S_R), mi/h	55.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.526	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4859	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	44.5

HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6307	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.87	Flow Rate (V_p), pc/h/ln	2610
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.10
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6077	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor	0.98	Flow Rate (V_p), pc/h/ln	2211
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.93
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	38.8
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	6307	838
Peak Hour Factor (PHF)	0.87	0.83
Total Trucks, %	8.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.909
Flow Rate (vi),pc/h	7829	1111
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.24	0.56

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1652.2	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	2780	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	11400	On-Ramp Influence Area Speed (SR), mi/h	6.4
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	5129	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	6240	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	49.3

HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Northbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (v_i)	6077	533
Peak Hour Factor (PHF)	0.98	0.88
Total Trucks, %	7.00	10.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.935	0.909
Flow Rate (v_i),pc/h	6632	666
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.01	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	1300.8	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	2780	Speed Index (M_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	0.0	Flow Outer Lanes (v_{OA}), pc/h/ln	2673
Distance to Downstream Ramp (L_{DOWN}), ft	11400	On-Ramp Influence Area Speed (S_R), mi/h	51.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	0.597	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3959	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4625	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	36.9

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	5553	456
Peak Hour Factor (PHF)	0.82	0.88
Total Trucks, %	11.00	22.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.901	0.820
Flow Rate (v_i),pc/h	7516	632
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.04	0.32

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	10800	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	798.8	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	3480	Off-Ramp Influence Area Speed (S_R), mi/h	56.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.543	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4816	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4816	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	43.6

HCS7 Freeway Diverge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road Off-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	7130	633
Peak Hour Factor (PHF)	0.78	0.92
Total Trucks, %	8.00	9.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.917
Flow Rate (v_i),pc/h	9872	750
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.37	0.38

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	0.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	10800	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	1253.9	Flow Outer Lanes (v_{OA}), pc/h/ln	2700
Distance to Downstream Ramp (L_{DOWN}), ft	3480	Off-Ramp Influence Area Speed (S_R), mi/h	56.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.479	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	7172	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	7172	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (D_R), pc/mi/ln	63.9

HCS7 Basic Freeway Report

Project Information

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Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	5097	Heavy Vehicle Adjustment Factor (f_{HV})	0.901
Peak Hour Factor	0.82	Flow Rate (V_p), pc/h/ln	2300
Total Trucks, %	11.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.97
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	54.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	41.9
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Basic Freeway Report

Project Information

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Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Between Keyes Road Off-ramp and On-ramp	Unit	United States Customary

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	0.66
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	67.7
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	6497	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor	0.78	Flow Rate (V_p), pc/h/ln	2998
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2377
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.26
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	2.3	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Merge Report

Project Information			
Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	AM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (Vi)	5097	950
Peak Hour Factor (PHF)	0.82	0.94
Total Trucks, %	11.00	17.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.901	0.855
Flow Rate (vi),pc/h	6899	1182
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.12	0.59

Speed and Density			
Upstream Equilibrium Distance (LEQ), ft	1468.3	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	38.7
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	4199	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	5381	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	42.6

HCS7 Freeway Merge Report

Project Information

Analyst	Fehr & Peers	Date	9/26/2019
Agency	Caltrans District 10	Analysis Year	2019
Jurisdiction	Stanislaus County	Time Period Analyzed	PM Peak Hour (Cumulative with Project Trips Combined)
Project Description	Southbound State Route 99 - Keyes Road On-ramp	Unit	United States Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1150	700
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi)	6497	1288
Peak Hour Factor (PHF)	0.78	0.93
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.926	0.952
Flow Rate (vi),pc/h	8995	1455
Capacity (c), pc/h	7200	2000
Volume-to-Capacity Ratio (v/c)	1.45	0.73

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	1975.3	Number of Outer Lanes on Freeway (NO)	1
Distance to Upstream Ramp (LUP), ft	3480	Speed Index (MS)	-
Downstream Equilibrium Distance (LEQ), ft	0.0	Flow Outer Lanes (vOA), pc/h/ln	2700
Distance to Downstream Ramp (LDOWN), ft	2650	On-Ramp Influence Area Speed (SR), mi/h	0.0
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	0.597	Outer Lanes Freeway Speed (SO), mi/h	-
Flow in Lanes 1 and 2 (v12), pc/h	6295	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	7750	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	Density in Ramp Influence Area (DR), pc/mi/ln	60.9

Appendix E:
Study Assumptions Memorandum



FEHR PEERS

Memorandum

Date: August 13, 2019

To: Andrew Malizia, PE, Stanislaus County Department of Public Works

From: Diwu Zhou, PE, Fehr & Peers

Subject: Keyes Community Plan Area TIA and Fee Update - Study Assumptions

WC19-3625

This memorandum documents the proposed analysis assumptions for the Keyes Community Plan (KCP) Area Transportation Impact Analysis (TIA) and Fee Update. The purpose of this memorandum is to confirm the project elements to be evaluated as part of the assessment and provide the project team and City staff an opportunity to review our analysis parameters and assumptions prior to the completion of the technical analysis.

Traffic Impact Fee Program

Stanislaus County seeks to update the existing KCP traffic impact fee program to account for current expectations for growth and transportation improvements.

As a starting point for the fee program update, we have compiled a comprehensive list of previously identified capital improvement projects as presented in **Table 1**. This list is derived from a review of the Northeast Keyes Community Plan Amendment TIA (1997), Keyes Area Community Plan (2000), Comprehensive Public Facilities Impact Fee Update Study (2017), Stanislaus Council of Government's Regional Transportation Plan (2018), and the Faith Home Road/ Garner Road Bridge Transportation Analysis Report (2018).

Table 1: Previously-Identified Capital Improvement Projects

Road	Limits	Length (miles)	Improvements
Faith Home Road	Redwood Rd. to Keyes Rd.	-	Replace Lateral 2 ½ Bridge.
		1.50	Widen SR 99 Overcrossing from 2 to 6 lanes. Widened Roadway from 2 to 4 lanes.
		1.50	Widen Roadway from 4 to 6 lanes.
Keyes Road	Faith Home Rd. to SR 99 SB Ramps	0.83	Widen Roadway from 2 to 4 lanes.
	SR 99 NB Ramps to Golden State Blvd.	0.13	Widen Roadway from 2 to 4 lanes.
	Faith Home Rd. to Golden State Blvd.	-	Widen SR 99 Overcrossing from 4 to 8 lanes. Widen SR 99 NB Ramps. Widen SR 99 SB Ramps.
		1.38	Widen Roadway from 4 to 6 lanes.
Golden State Blvd.	Keyes Rd.	-	Traffic Signal Modification.
	Taylor Rd. to Keyes Rd.	1.10	Widen Roadway from 2 to 4 lanes.
	Taylor Rd. to Nunes Rd.	0.27	Widen Roadway from 2 to 4 lanes.
Washington Road	Nunes Rd. to T.I.D Lateral No. 2 1/2	-	Replace Lateral 2 ½ Bridge.
		1.10	Widen Roadway to 60′ major collector standard.
Nunes Road	Golden State Blvd. to Washington Rd.	0.20	Widen Roadway to 60′ major collector standard.

Sources: Stanislaus Council of Government Plan, 2018; KCP, 2000; Northeast Keyes Community Plan, 2003; Comprehensive Public Facilities Impact Fee Update Study, 2017; Faith Home Road/Garner Road Bridge Transportation Analysis Report, 2018; Fehr & Peers, 2019.

Growth Assumptions

Land-use and future traffic volume forecasts from the City of Ceres General Plan model (Ceres Model) and Faith Home Road/Garner Road Bridge model were referenced to evaluate the continued applicability of each capital improvement project. Both models are derived from the Three-County (San Joaquin, Stanislaus, and Merced) regional travel demand model, developed as a part of the San Joaquin Valley Model Improvement Program.

The Ceres model is calibrated for a 2014 base year and provides forecasts for the buildout year 2040. The model was refined using land use and network characteristics within the specific General Plan Area boundary based on field observations, published reports, data compiled by others on the General Plan update team, and American Community Survey (ACS) data. Note that the Ceres model does not include the Faith Home Road/Garner Road Bridge in the buildout year.

The Faith Home Road/Garner Road Bridge model is a combination of the City of Modesto General Plan model (Modesto model) and the Ceres model. The 2017 base year model was validated to existing daily and peak hour traffic counts using the validation thresholds from the *California Regional Transportation Plan Guidelines* (CTC, 2017), and has a horizon year of 2045. The Faith Home Road/Garner Road Bridge model was used in the analysis of the Faith Home Road/Garner Road Bridge across the Tuolumne River. The project alternatives for the bridge differ in the size of the proposed roadway; Alternative 1 was for a two-lane roadway and bridge, while Alternative 2 was for a four-lane roadway. For the purposes of our current work in Keyes, we refer to the Alternative 2 results.

Land-Use Summary

Land-use projections for transportation analysis zones (TAZs) within the census-designated place of Keyes (Keyes) and surrounding TAZs are derived from the Ceres model and are provided in **Table 2**. A map of the TAZs within and directly adjacent to Keyes is provided in **Figure 1** (all figures and attachments are provided at the end of the memorandum).

The base year model assumes 1,536 households, 4,651 people, and 425 jobs within Keyes. The cumulative year model assumes 2,710 households, 8,144 people, and 754 jobs within Keyes. The net growth within Keyes is 1,174 households, 3,494 people, and 329 jobs.

TAZs near Keyes are shown in the second half of **Table 2;** most of those zones are projected to change very little over time, but a few have notable amounts of growth, including TAZ 5485, located east of SR 99 and north of Keyes along Redwood Road, and TAZ 5495, located west of SR 99 and

northwest of Keyes along Faith Home Road. The net growth within TAZ 5485 between the base and cumulative years is 99 households and 297 people. The net growth within TAZ 5495 between the base and cumulative years is 643 jobs.

Table 2: Land-Use Summary

TAZ	Base Year			Cumulative Year			Growth/Difference		
	Total Households	Household Population	Total Employment	Total Households	Household Population	Total Employment	Total Households	Household Population	Total Employment
Within Census Designated Place - Keyes									
5258	0	0	0	0	0	0	0	0	0
5259	15	46	0	15	46	0	0	-0	0
5260	97	300	3	93	287	3	-4	-13	0
5364	203	564	2	214	598	2	+11	+34	0
5365	33	103	4	44	137	4	+11	+34	0
5366	0	0	0	0	0	0	0	0	0
5367	201	558	271	236	596	189	+35	+38	-82
5368	5	14	91	5	14	245	0	+0	+154
5369	19	59	0	19	59	247	0	-0	+247
5371	454	1416	11	808	2502	9	+354	+1086	-2
5372	1	3	34	43	135	29	+42	+132	-5
5373	508	1586	9	1233	3770	26	+725	+2184	+17
5374	0	0	0	0	0	0	0	0	0
Total:	**1536**	**4651**	**425**	**2710**	**8144**	**754**	**+1174**	**+3494**	**+329**
Surrounding Area									
5303	10	30	0	10	30	0	0	-0	0
5304	0	0	4	0	0	4	0	0	0
5308	77	230	11	73	218	8	-4	-12	-3
5347	40	120	1	38	114	1	-2	-6	0

Table 2: Land-Use Summary

TAZ	Base Year			Cumulative Year			Growth/Difference		
	Total Households	Household Population	Total Employment	Total Households	Household Population	Total Employment	Total Households	Household Population	Total Employment
5483	4	13	0	13	40	0	+9	+27	0
5484	1	3	0	1	3	0	0	0	0
5485	61	193	4	160	490	4	+99	+297	0
5486	1	3	0	1	3	0	0	0	0
5487	0	0	8	0	0	8	0	0	0
5489	0	0	21	0	0	21	0	0	0
5495	0	0	0	0	0	643	0	0	+643
5497	0	0	0	0	0	0	0	0	0
5504	30	77	26	30	77	26	0	0	0
5505	18	47	8	18	47	8	0	0	0
6168	0	0	196	0	0	166	0	0	-30
6169	17	52	3	17	52	3	0	+0	0
6174	40	125	43	38	118	36	-2	-7	-7
6177	0	0	162	0	0	195	0	0	+33
6178	1	3	353	1	3	292	0	-0	-61
6179	44	137	5	42	130	5	-2	-7	0
6180	0	0	15	0	0	12	0	0	-3
6240	0	0	0	0	0	0	0	0	0
6243	10	31	0	10	31	0	0	-0	0

Source: City of Ceres General Plan model, 2014; Fehr & Peers, 2019.

Traffic Volume Forecasts

Future traffic volume forecasts from the cumulative year (2040) Ceres model and Alternative 2 (4-lane bridge) of the design year (2045) Faith Home Road/Garner Road Bridge model are presented in **Table 3**. Please note that these volumes have been taken directly from the future year models and have not been adjusted for the base year model's relationship to existing traffic counts. These numbers are for the purpose of initial screening.

Table 3: Traffic Volume Forecasts

Road	Ceres Model (2040)				Faith Home Road/ Garner Road Bridge Model (2045)			
	Number of Lanes	Daily Volume	Daily Vehicles per lane	LOS[1]	Number of Lanes	Daily Volume	Daily Vehicles per lane	LOS[1]
NB Faith Home Road North of Service Road	2	7,300	3,650	A	3	8,910	2,970	A
SB Faith Home Road North of Service Road	2	7,060	3,530	A	3	8,840	2,947	A
NB Faith Home Road North of Keyes Road	2	8,020	4,010	B	2	7,410	3705	A
SB Faith Home Road North of Keyes Road	2	8,360	4,180	B	2	7,170	3585	A
EB Keyes Road West of SR 99	2	6,660	3,330	A	2	6,560	3280	A
WB Keyes Road West of SR 99	2	5,150	2,575	A	2	4,870	2435	A
EB Keyes Road East of SR 99	2	5,540	2,770	A	2	5,570	2785	A
WB Keyes Road East of SR 99	2	5,080	2,540	A	2	4,300	2150	A
NB Golden State Boulevard South of Keyes Road	1	4,200	4,200	B	1	4,670	4,670	B
SB Golden State Boulevard South of Keyes Road	1	3,930	3,930	B	1	4,550	4,550	B

Note(s):

1. Level of Service for roadway segments by street classification as defined in the Stanislaus County General plan. Faith Home Road and Keyes Road are classified as Principal Arterials within the study area. Golden State Boulevard is classified as a Minor Arterial within the study area.

Source: Fehr & Peers, 2019.

Project Considerations

Based on our review of planned land-use changes, transportation network assumptions, and traffic volume forecasts from the Ceres model and the Faith Home Road/Garner Road Bridge model, it appears that both Faith Home Road and Keyes Road would function adequately at a width of 4 lanes, while Golden State Boulevard would function adequately at a width of 2 lanes. Note that these conclusions might change if the underlying assumptions about future land use growth were to be modified.

Based on this initial evaluation, a modified list of capital improvement projects for inclusion in the KCP fee program is presented in **Table 4**.

Table 4: Potential Capital Improvement Projects for KCP Fee Program

Road	Limits	Length (miles)	Improvements
Faith Home Road	Redwood Rd. to Keyes Rd.	-	Replace Lateral 2 ½ Bridge.
		1.50	Widen SR 99 Overcrossing from 2 to 4 lanes. Widened Roadway from 2 to 4 lanes.
Keyes Road	Faith Home Rd. to SR 99 SB Ramps	0.83	Widen Roadway from 2 to 4 lanes.
	SR 99 NB Ramps to Golden State Blvd.	0.13	Widen Roadway from 2 to 4 lanes.
	SR 99	-	Widen SR 99 NB Ramps. Widen SR 99 SB Ramps.
	Faith Home Rd.	-	Traffic Signal Modification.
	Golden State Blvd.	-	Traffic Signal Modification.
Washington Road	Nunes Rd. to T.I.D Lateral No. 2 1/2	-	Replace Lateral 2 ½ Bridge.
		1.10	Widen Roadway to 60' major collector standard.
Nunes Road	Golden State Blvd. to Washington Rd.	0.20	Widen Roadway to 60' major collector standard.

Sources: Fehr & Peers, July 2019.

Fee Program Development

Transportation Impact Fee programs, including the KCP TIF, must comply with basic fee program requirements, including:

- ***Identify the purpose of the fee*** – The KCP TIF generates funds from new development to pay for transportation facilities identified as part of the *Stanislaus County General Plan*, and associated Environment Document subsequent implementation documents such as the *Keyes Community Plan*.
- ***Identify how the fee will be used on the facilities to be funded through the fee*** – Funds generated by the KCP *TIF* will be used to implement a range of transportation projects to be detailed in the fee program.
- ***Determine how there is a reasonable relationship between the fee's use and the type of development on which the fee is imposed*** – The fee would be imposed on future development projects in Keyes commensurate with their projected level of auto trip generation based on trip generation rates from *Trip Generation Manual,* Institute of Transportation Engineers (ITE), 10th Edition.
- ***Determine how there is a reasonable relationship between the need for the public facility and the type of development on which the fee is imposed*** – The fee program is designed to accommodate and mitigate the impact of future travel demand in line with the population and employment growth in the Keyes Community.
- ***Determine how there is reasonable relationship between the amount of the fee and the cost of the public facility (or portion of the facility) attributable to new development*** – Because the fee will be charged based on auto trips generated by new development and is used to either accommodate those trips or reduce existing auto trips such that the transportation system is able to accommodate future growth, there is a rational nexus between fee collection and fee usage. The improvements will also increase travel choices for the community as specified in the General Plan goals. The improvements in the fee program are not designed to fix existing deficiencies; rather they are designed to accommodate new development.

GC 66000 defines transportation facilities for purposes of impact fee programs to include pedestrian, bicycle, transit and traffic calming projects as well as auto-capacity related infrastructure projects.

TIA Study Assumptions

There are three proposed projects within the Community of Keyes, all located near the intersection of Keyes Road at North Golden State Boulevard, as shown on **Figure 2**. Descriptions of each of the proposed projects are provided below:

- 30,000 square-foot semi-truck lease, rental and service facility, and 5,000 square-foot office located at southwest corner (ITC Enterprises);
- 7,000 square-foot convenience market, 4,278 square-foot potential restaurant, 16-pump fuel station, 14,100 square-foot truck wash and repair, 43 truck parking spaces, and a secondary fueling area with 5 diesel fueling stations at northeast corner (Nunes Road Travel Plaza); and
- 4,800 square-foot convenience market, two 3,000 square-foot fast food restaurants with drive-thru, 2,000 square-foot fast-food restaurant, 12-pump fuel station, and 30 truck parking spaces at northwest corner (Kamir Incorporated).

Site plans for each of the proposed projects are provided in **Figures 3A-C**.

Travel Characteristics

This section provides an overview of the project trip generation and trip distribution that will form the basis for the evaluation of project impacts on the surrounding roadway network. The traffic impacts associated with each project includes:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the project site is estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the project site is projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. For this project, estimates of weekday morning and evening peak hour trip generation were developed to coincide with the morning and evenings

levels of peak activity when traffic flows on SR 99 are the highest, in addition to an estimate of daily weekday traffic volumes.

For the ITC Enterprises development, trip generation will be estimated using local driveway counts at the existing Peterbilt development, located directly adjacent to the proposed ITC Enterprises development. A local trip rate specific to truck leasing/rental/service facilities will be developed using the driveway counts. The local trip rate will be compared to similar ITE land uses for reasonableness.

For the Nunes Road Travel Plaza and Kamir Incorporated developments, trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, *10th Edition*. The resulting vehicle trip generation estimates are presented in **Table 5**.

Internalized Trips

Internalized trips represent trips made within the site; for example, a patron might stop for fuel at the gas station and then use the truck wash. For this assessment it was assumed that trips to or from the truck wash and repair area would be internalized trips from the gas/service station and/or convenience market. It was also assumed that internalized trips between the gas station/convenience market and the fast food restaurant(s) are negligible.

Pass-By and Diverted Trips

Driveway traffic at the Nunes Road Travel Plaza and Kamir Incorporated development is comprised of: (1) new traffic generated by the project, (2) traffic that would otherwise already be on the adjacent roadways but the driver decides to stop at the site (e.g., to purchase an item on their way home from work), and (3) traffic on other nearby roadways, but the driver decides to take a short detour to stop at the site (e.g., to exit off the freeway for gas). The trips in Item 2 are referred to as "pass-by" trips and the trips in Item 3 are referred to as "diverted-link" trips.

Information contained in the ITE *Trip Generation Handbook, 3rd Edition* and surveys of similar uses was used to estimate pass-by trips.

- Fast-food restaurants with drive thru windows have an average pass-by trip rate of approximately 50 percent, and an average diverted trip rate of approximately 25 percent during both the morning (AM) and evening (PM) peak hours;
- Gas/service stations with convenience markets have an average pass-by trip rate of approximately 60 percent during the AM and PM peak hours, and an average diverted trip

rate of approximately 20 percent during the AM peak hour and 30 percent during the PM peak hour.

Table 5: Trip Generation Estimates

Land-Use	Size	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
ITC Enterprises								
Truck lease/rental facility	30,000 sq. ft.	Local data will be used to estimate trip rates						
Office	5,000 sq. ft.							
Total Net New Trips								
Nunes Road Travel Plaza								
Convenience Market/ Gas Station[1]	21 vehicle fueling stations	4,800	295	295	590	241	241	482
Pass-by Trips (60%)		(-2,880)	(-177)	(-177)	(-354)	(-145)	(-145)	(-290)
Diverted Trips (20% AM/30% PM & Daily)		(-1,440)	(-59)	(-59)	(-118)	(-72)	(-72)	(-144)
Fast Food Restaurant with Drive Thru[2]	4.278 sq. ft.	2,000	88	84	172	73	67	140
Pass-by Trips (50%)		(-1,000)	(-44)	(-42)	(-86)	(-37)	(-34)	(-71)
Diverted Trips (25%)		(-500)	(-22)	(-21)	(-43)	(-18)	(-17)	(-35)
Total Net New Trips		**980**	**81**	**80**	**161**	**42**	**40**	**82**
Kamir Incorporated								
Convenience Market/ Gas Station[1]	12 vehicle fueling stations	2,800	168	169	337	138	138	276
Pass-by Trips (60%)		(-1680)	(-101)	(-101)	(-202)	(-83)	(-83)	(-166)
Diverted Trips (20/30%)		(-840)	(-34)	(-34)	(-68)	(-41)	(-41)	(-82)
Fast Food Restaurant with Drive Thru[2]	6,000 sq. ft.	2,800	123	118	241	102	94	196
Pass-by Trips (50%)		(-1400)	(-62)	(-59)	(-121)	(-51)	(-47)	(-98)
Diverted Trips (25%)		(-700)	(-31)	(-30)	(-61)	(-26)	(-24)	(-50)
Fast Food Restaurant without Drive Thru[3]	2,000 sq. ft.	700	30	20	50	28	29	57
Pass-by Trips (50%)		(-350)	(-15)	(-10)	(-25)	(-14)	(-15)	(-29)
Diverted Trips (25%)		(-180)	(-8)	(-5)	(-13)	(-7)	(-7)	(-14)
Total Net New Trips		**1,150**	**70**	**68**	**138**	**46**	**44**	**90**

Notes:
1. Based on *Trip Generation* (10th Edition) trip generation rates for land use 960, Super Convenience Market/Gas Station
2. Based on *Trip Generation* (10th Edition) trip generation rates for land use 934, Fast Food Restaurant with Drive Thru
3. Based on *Trip Generation* (10th Edition) trip generation rates for land use 933, Fast Food Restaurant without Drive Thru

Source: Fehr & Peers, July 2019

In other words, at a typical gas station, approximately, 90 percent of the traffic entering and exiting the site during the PM peak hour is already on the surrounding roadway system. For this assessment, it was assumed that pass-by/diverted trips for the fast-food restaurants (with or without a drive thru window) would comprise 75 percent of the trip generation, and that pass-by/diverted trips for the gas/service stations with convenience markets would comprise 80 to 90 percent of the trip generation. While pass-by and diverted trips are not new vehicle trips to the overall roadway system, they are accounted for in the analysis of driveway operations. Additionally, diverted trips have the potential to change travel patterns in the area, especially at the interchange. These changed travel patterns will be accounted for in the roadway operations analysis.

Trip Distribution & Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Project trip assignment refers to the specific route and roadway segments vehicles would take to access and leave the site.

Due to the high percentage of pass-by and diverging trips, the project trip distribution of the proposed projects was estimated using previously collected traffic counts from other projects on the existing roadway system. The preliminary trip distribution for the proposed projects are presented in **Figure 4**.

Analysis Parameters

The transportation assessment will include weekday morning, (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak period analyses to coincide with the time periods when adjacent street traffic demands are highest. Multimodal traffic counts, including vehicles, bicycles, and pedestrians, will be collected at each of the study intersections. Based on the initial project trip generation and trip distribution patterns, we recommend including the following study intersections, as presented in **Figure 5**:

1. Faith Home Road at Keyes Road
2. Foote Road at Keyes Road
3. State Route 99 Southbound Ramps at Keyes Road
4. State Route 99 Northbound Ramps at Keyes Road
5. 9th Street/Golden State Boulevard at Nunes Road
6. Golden State Boulevard at Keyes Road
7. South Washington at Nunes Road
8. Nunes Road at Keyes Road

9. Golden State Boulevard at Barnhart Road
10. Kamir Incorporated Driveway (North) at Golden State Boulevard
11. Kamir Incorporated Driveway (Middle)/Nunes Road Travel Plaza Driveway (North) at Golden State Boulevard
12. Nunes Road Travel Plaza (Middle) at Golden State Boulevard
13. Kamir Incorporated Driveway (South)/Nunes Road Travel Plaza Driveway (South) at Golden State Boulevard
14. ITE Enterprises Project Driveway at Golden State Boulevard

Additionally, we will conduct a ramp merge/diverge assessment for the Keyes Road interchange:

1. Northbound SR 99 Off Ramp to Keyes Road
2. Northbound SR 99 On Ramp from Keyes Road
3. Southbound SR 99 Off Ramp to Keyes Road
4. Southbound SR 99 On Ramp from Keyes Road

We will also conduct a freeway mainline assessment for the segments of SR 99 immediately north and south of Keyes Road:

1. Northbound SR 99 Off Ramp to Keyes Road (Diverge)
2. Northbound SR 99 between Off Ramp and On Ramp at Keyes Road (Basic)
3. Northbound SR 99 On Ramp from Keyes Road (Merge)
4. Southbound SR 99 Off Ramp to Keyes Road (Diverge)
5. Southbound SR 99 between Off Ramp and On Ramp at Keyes Road (Basic)
6. Southbound SR 99 On Ramp from Keyes Road (Merge)

Analysis Methodology & Scenarios

Intersections will be evaluated for the following scenarios using the Synchro 10 software based on procedures outlined in the Highway Capacity Manual, 6th Edition (Transportation Research Board):

- Existing Conditions – Existing traffic volumes based on recent count data.
- Existing with ITC Enterprises – Existing traffic volumes based on recent count data plus traffic expected to be generated by the ITC Enterprises project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.
- Existing with Nunes Travel Plaza – Existing traffic volumes based on recent count data plus traffic expected to be generated by the Nunes Travel Plaza project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

- Existing with Kamir Incorporated – Existing traffic volumes based on recent count data plus traffic expected to be generated by the Kamir Incorporated project. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

- Existing with ITC Enterprises, Nunes Travel Plaza, Kamir Incorporated – Existing traffic volumes based on recent count data plus traffic expected to be generated by all three development proposals in the area. The intent of this scenario is to determine if there are immediate impacts in the existing condition if all three projects are constructed. This scenario assumes the signalization of the SR 99/Keyes Road Interchange with no road or ramp modifications.

- Cumulative – Cumulative year forecasts will be derived from the Three-County Travel Demand Model used for the Ceres General Plan update. Land use growth within the community of Keyes will be reviewed with County Staff for reasonableness prior to use of the model. This task does not include a detailed subarea model validation/calibration.

- Cumulative with Projects – Projected cumulative traffic volumes plus traffic expected to be generated by all three development proposals. Should impacts be identified with development of all three projects, the proportionate share of traffic added to each impacted location will be estimated.

Based on the results of the analysis, we will identify impacts to all travel modes (including transit, bicycle, and pedestrian systems) and develop potential mitigation measures.

Thresholds of Significance

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by Stanislaus County and the California Department of Transportation.

The impacts of the project will be evaluated by comparing the results of the technical analysis under Plus Project conditions to the results under Existing and Cumulative without Project conditions. The following criteria were used to identify significant off-site intersection impacts of the proposed projects under the various criteria.

Stanislaus County General Plan

For this study, based on guidance contained in the County of Stanislaus General Plan and recently prepared environmental documents for other projects in the County, a significant transportation-related impact could occur if:

- Project would substantially increase traffic relative to existing load and capacity;

- Project traffic would result in operations below the acceptable thresholds:
    - For a roadway segment in Stanislaus County, the project would cause the LOS to degrade to LOS E or worse; and
    - For a roadway intersection in Stanislaus County, the project would cause the LOS to degrade to LOS D or worse;
- Project would add traffic to existing roadways/intersections that already exceed the acceptable threshold;
- Project would substantially increase hazards due to design feature or incompatible uses;
- Project would result in inadequate emergency access.

California Department of Transportation

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities (Guide for the Preparation of Traffic Studies, Caltrans, December 2002); however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible. A standard of LOS D or better on a peak hour basis was used as the planning objective for the evaluation of potential impacts to Caltrans facilities of this development as that is the standard set for Caltrans facilities in the study area by Stanislaus County. The following criteria were used to evaluate potential impacts to Caltrans facilities:

- If a Caltrans facility is projected to operate at LOS D or better without project and the project is expected to cause the facility to operate at LOS E or worse, the impact may be considered significant.
- If a Caltrans facility is projected to operate at LOS E or F without project and the project is expected to increase delay, the impact may be considered significant.

VMT Screening

Consistent with SB 743 requirements, Fehr & Peers will estimate project-generated daily vehicle miles of travel (VMT) using the Three County Model. Total daily VMT can be converted into VMT per capita and per employee estimates. Local agencies have discretion to establish VMT-related significance criteria; our understanding is that Stanislaus County has not yet established VMT criteria. Fehr & Peers will coordinate with County staff to identify appropriate methodologies to evaluate potential impacts on VMT. This task does not include a detailed threshold setting process.

Next Steps

We appreciate your time to review and comment on the preliminary project list for the KCP fee program update and transportation impact study assumptions described in this memorandum prior to the commencement of the technical analysis. Please call Diwu at 925-930-7100 with questions or comments.

Attachments:

Figure 1	Three County Model TAZs near Keyes
Figure 2	Site Vicinity Map
Figure 3A	Conceptual Project Site Plan - ITC Enterprises
Figure 3B	Conceptual Project Site Plan – Nunes Road Travel Plaza
Figure 3C	Conceptual Project Site Plan – Kamir Incorporated
Figure 4	Preliminary Project Trip Distribution
Figure 5	Proposed Study Intersection Locations

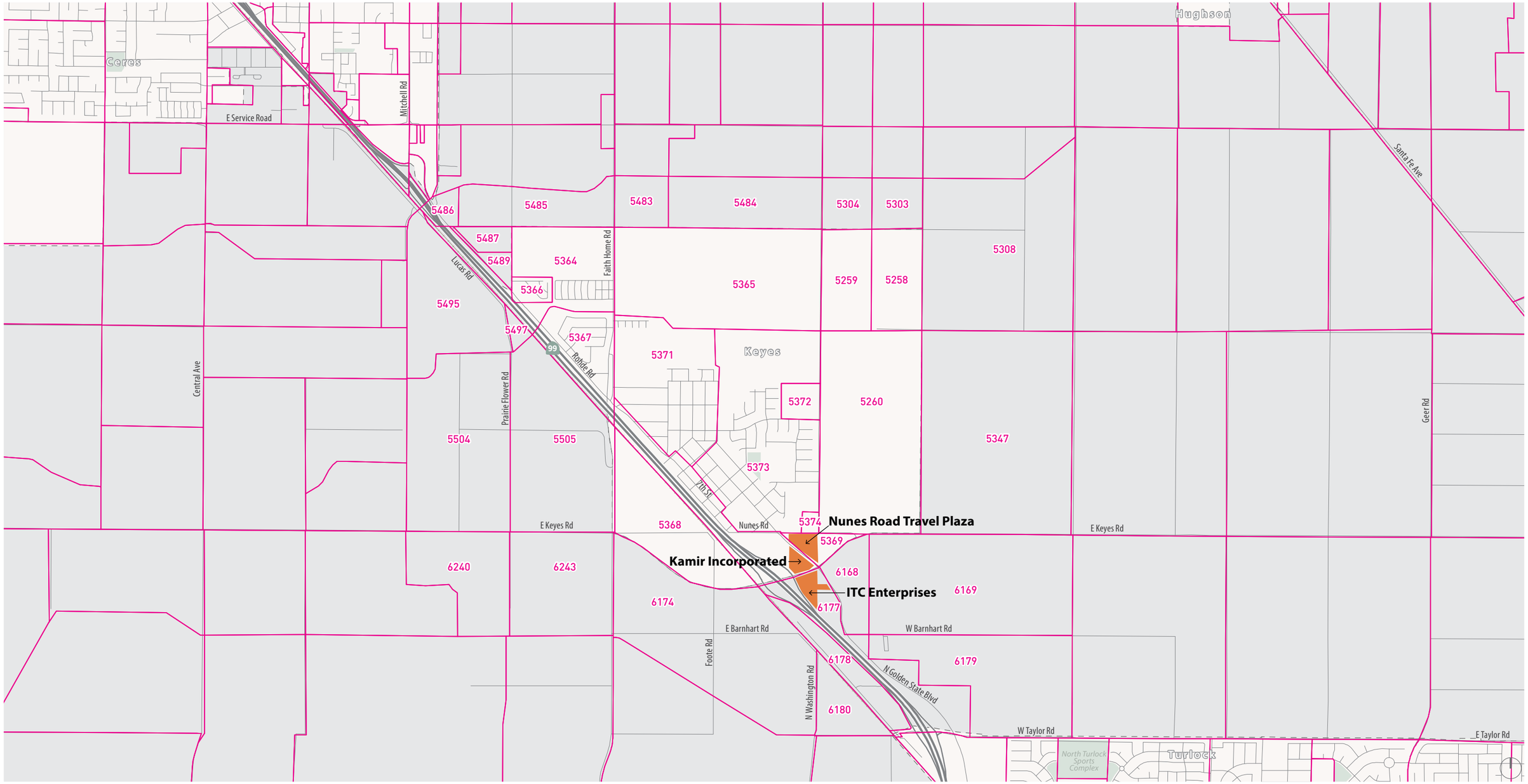


Figure 1

Three County Model TAZs Near Keyes

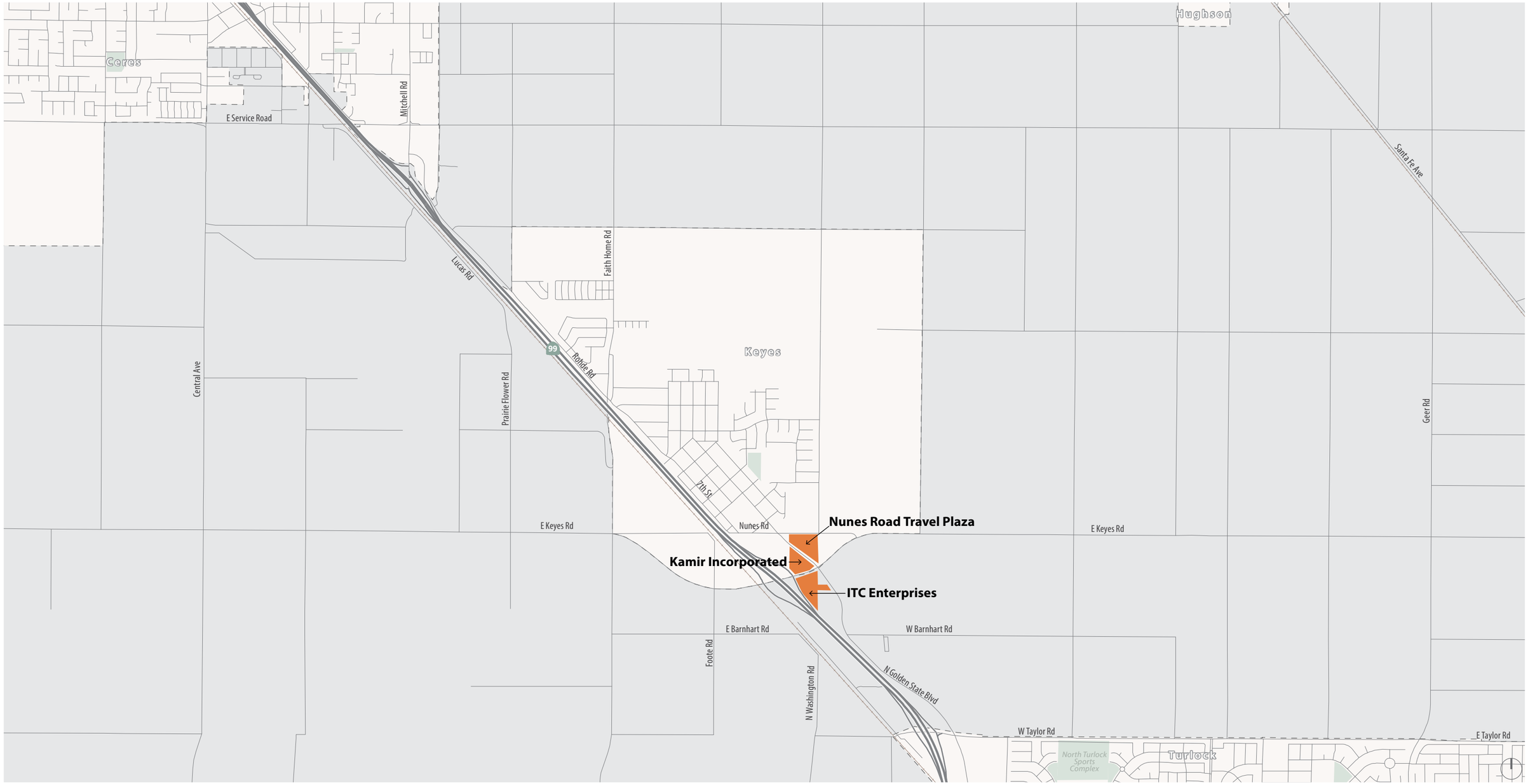


Figure 2

Site Vicinity Map

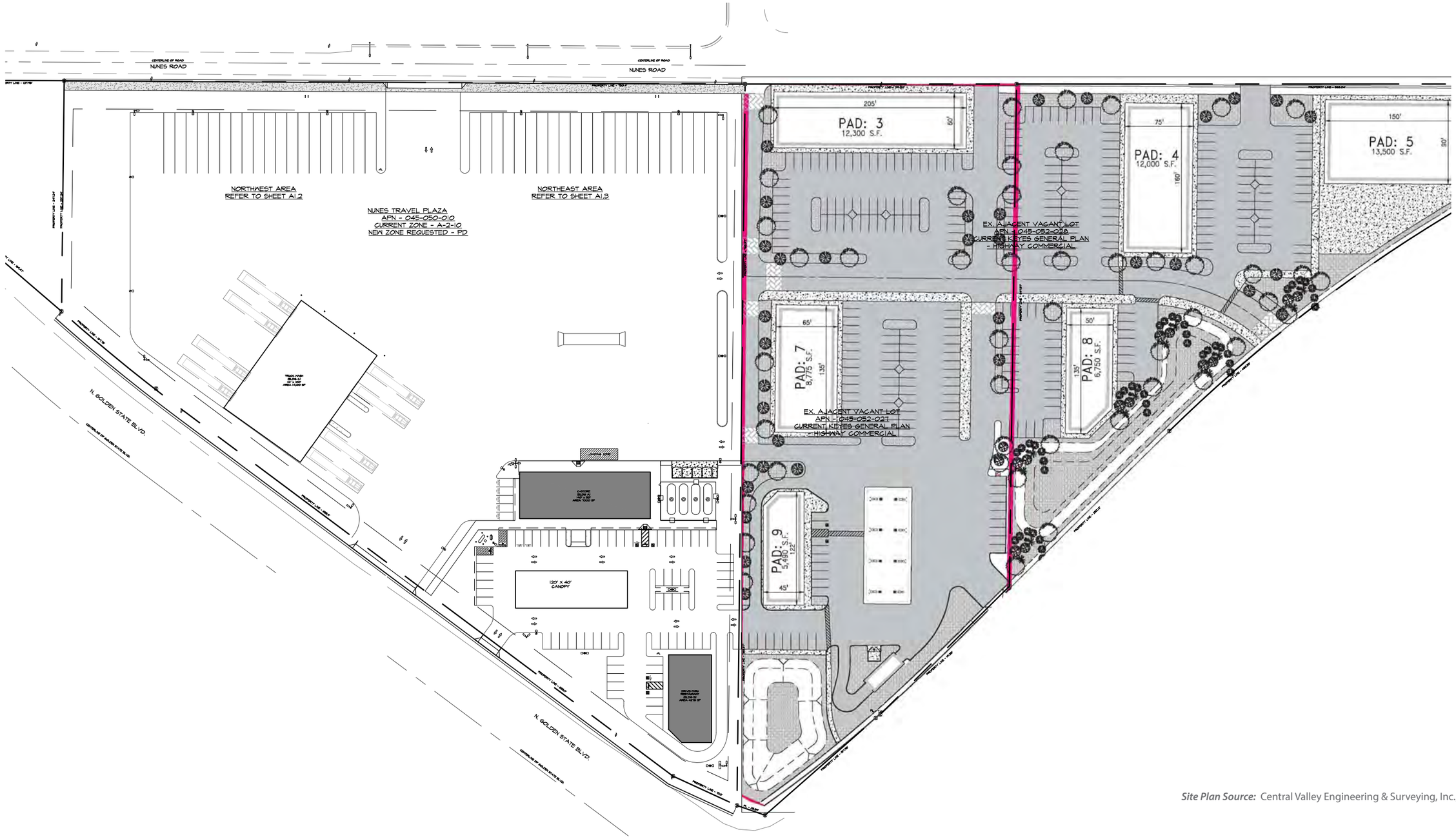
WC19-3625_2_SiteVic



Site Plan Source: North Star Engineering Group, 2018.

Figure 3A

Conceptual Project Site Plan — ITC Enterprises



Site Plan Source: Central Valley Engineering & Surveying, Inc., 1/22/18.

Figure 3B

Conceptual Project Site Plan — Nunes Road Travel Plaza



Site Plan Source: Magallon Construction Co., Inc., 10/4/18.

Figure 3C

Conceptual Project Site Plan — Kamir Incorporated

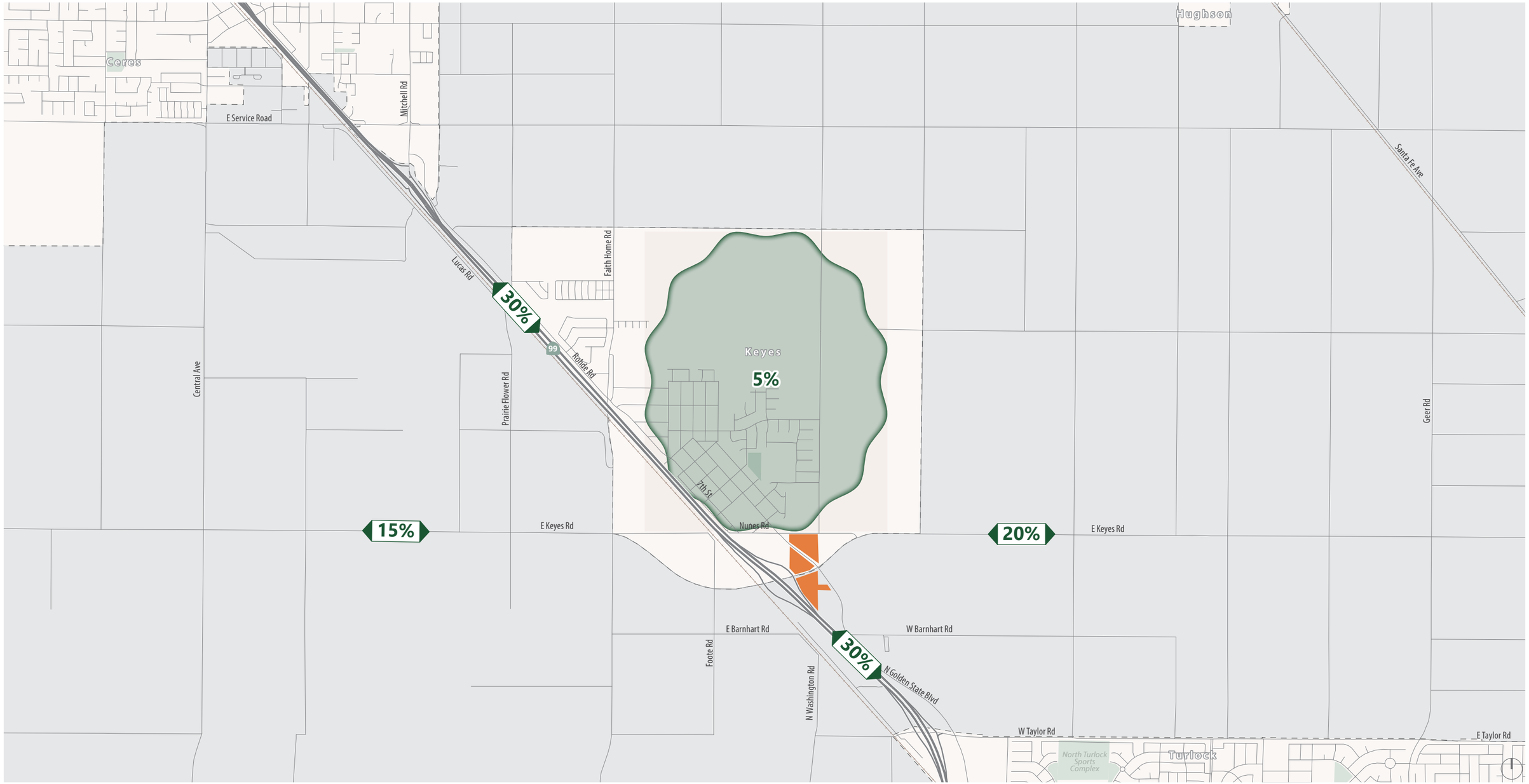


Figure 4

Preliminary Project Trip Distribution



Project Sites # Study Intersection

Figure 5

Proposed Study Intersection Locations

ENVIRONMENTAL PERMITTING SPECIALISTS
Air Quality • Permitting • OHSA • RMP/PSM

February 02, 2020

Cherie Clark
San Joaquin Valley APCD
1990 East Gettysburg Ave
Fresno, CA 93726

Subject: Response to Comments Dated January 15, 2019 for
Proposed Nunes Road Travel Plaza, Keyes, CA
District CEQA Reference 20181348

Dear Ms. Clark:

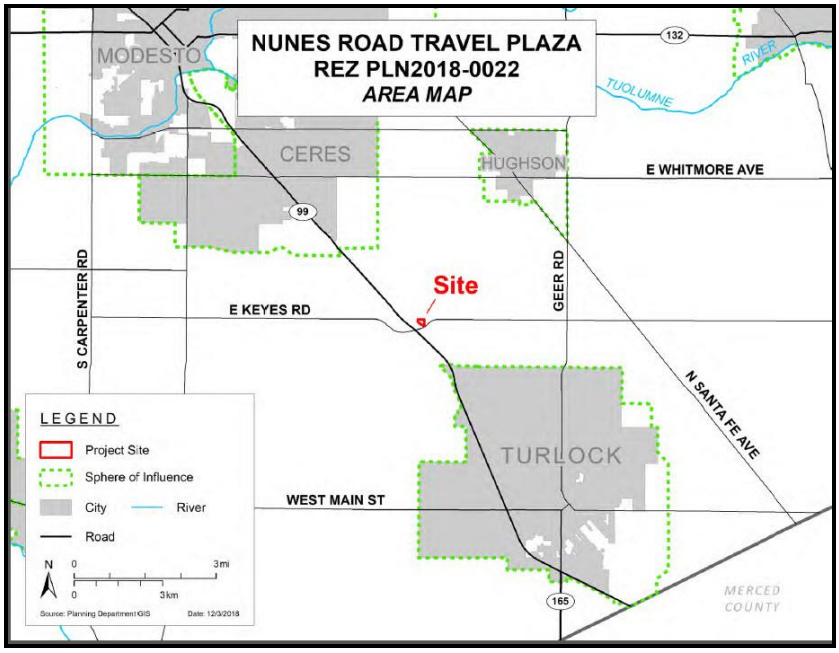
In response to District comments on the above referenced project I am providing the requested analysis and other information for the proposed travel plaza to be located in Keyes, CA. The project would be located near the intersection of North Golden State Blvd., and East Keyes Road. Figure 1 illustrates the project site.

The travel plaza consists of car and truck fueling stations, a convenience store, a building for future fast food restaurants. A truck wash and repair building and parking spaces are also included in the project. Specific project details are provided in Tables 1 and 2:

Table 1
Project Components

Item	Description	Details
1	Site Area	8.6 Acres
2	Convenience Store	7,000 Square Feet
3	Shell Building for Future Fast Food Restaurant	4,278 Square Feet
4	Truck Wash and Repair Building	14,100 Square Feet
5	Gasoline Fueling Stations	16
6	Diesel Fuelling Truck Stations	6
7	Truck Parking Spaces	43

Figure 1
Project Location and Site Maps



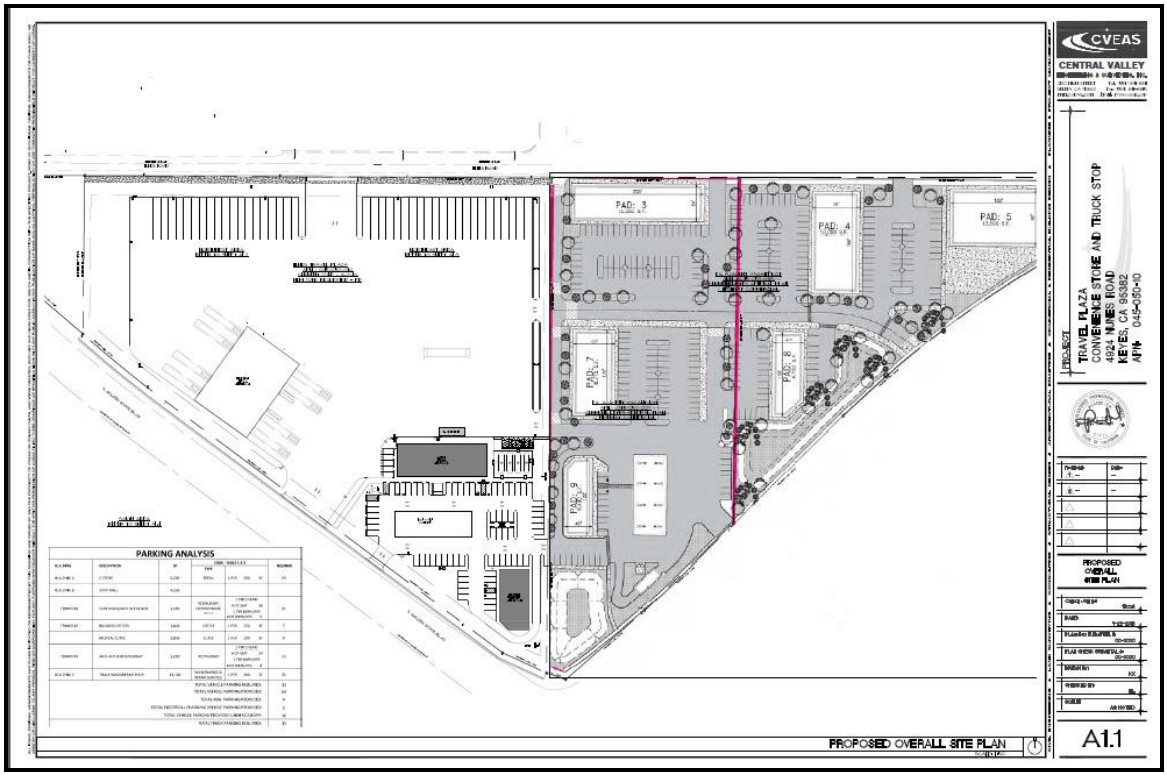


Table 2 Project Metrics		
Item	**Description**	**Details**
9	Daily Traffic Volume	9980 new trips per day *Ref: Fehr & Peers Traffic Engineers, Irvine, CA*
10	Monthly Gasoline Throughput	250,000 Gallons per Month
11	Monthly Diesel Throughput	300,000 Gallons per Month
12	Construction Schedule	June 2020 to May 2021
13	Operational Year	July 2021

The District's comments identified the following items that needed to be addressed:

1. CONSTRUCTION EMISSIONS
2. OPERATIONAL EMISSIONS
3. NUISANCE ODORS
4. HEALTH RISK SCREENING EVALUATION
5. AMBIENT AIR ANALYSIS
6. MITIGATED NEGATIVE DECLARATION
7. NEED FOR AN EIR
8. COMPLIANCE WITH RULES 2201 AND 2010
9. COMPLIANCE WITH RULE 9510 (ISR)
10. COMPLIANCE WITH RULE 4692 (PM-25 FROM UNDERFIRE CHARBROILERS)
11. COMPLANCE WITH MISC. DISTRICT REGULATIONS

The responses to these items are provided below. Detailed calculations and data are provided in Attachments 1 to 5.

1. CONSTRUCTION EMISSIONS

As requested in the District's comment, we have used the CalEEMod emissions estimation model Version 2016.3.2 to determine construction emissions. The model results are based on the project data presented in Tables and 1 and 2. Construction is expected to begin June 1, 2020 and finish by the end of May 2021. No significant

demolition or importing/exporting of soil is anticipated. In addition, since the site is relatively flat with no existing structures, minimal grading will be required. The choice and number of construction equipment, load factors, etc., are based on recommended default CalEEMod values. A copy of the CalEEMod model results are provided in Attachments 1 and 3. Electronic copies of the input/output files are attached. The results in terms of annual and daily emissions of criteria air pollutants are provided in Tables 3 and 4.

Table 3
Maximum Annual Construction Emissions

2.1 Overall Construction
Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1679	1.5912	1.2212	2.0700e-003	0.1613	0.0870	0.2483	0.0848	0.0812	0.1660	0.0000	179.4207	179.4207	0.0465	0.0000	180.5834
2021	0.2150	1.2578	1.2233	2.0200e-003	4.1300e-003	0.0682	0.0723	1.1200e-003	0.0640	0.0651	0.0000	174.7791	174.7791	0.0422	0.0000	175.8346
Maximum	**0.2150**	**1.5912**	**1.2233**	**2.0700e-003**	**0.1613**	**0.0870**	**0.2483**	**0.0848**	**0.0812**	**0.1660**	**0.0000**	**179.4207**	**179.4207**	**0.0465**	**0.0000**	**180.5834**

Table 4
Maximum Daily Construction Emissions

2.1 Overall Construction (Maximum Daily Emission)
Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1681	42.4677	22.1821	0.0396	18.2141	2.1985	20.4126	9.9699	2.0226	11.9925	0.0000	3,844.8964	3,844.8964	1.1969	0.0000	3,874.8190
2021	8.0646	17.6616	16.7445	0.0278	0.1232	0.9595	1.0058	0.0327	0.9021	0.9147	0.0000	2,646.8961	2,646.8961	0.7177	0.0000	2,662.4361
Maximum	**8.0646**	**42.4677**	**22.1821**	**0.0396**	**18.2141**	**2.1985**	**20.4126**	**9.9699**	**2.0226**	**11.9925**	**0.0000**	**3,844.8964**	**3,844.8964**	**1.1969**	**0.0000**	**3,874.8190**

2. OPERATIONAL EMISSIONS

As requested in the District's comment, we have used the CalEEMod emissions estimation model. As with construction emissions, the model calculations are based on the project data presented in Tables and 1 and 2. The travel plaza is expected to be operational by July 2021.

Default trip lengths for this project range from 7.3 miles to 9 miles. That means that the CalEEMod model assumes the trips would originate either in Modesto or just South of Salida.

Clearly, that will not be the case for this project as there are many other gasoline stations and convenience stores in Modesto and Salida and residents in these towns would not travel to Keyes to purchase gasoline or visit a convenience store. Use of default trip lengths would mischaracterize the actual trip lengths associated with this project.

For the current project, most of the customers will exit Highway 99 for re-fueling and then return to the Highway. This trip length is estimated to be less than 0.5 mile. Customers residing in the town of Keyes who travel to the gas station would have a maximum trip length of 1.35 miles. We have used a trip length of 1.35 miles. This trip length is a conservative estimate of each trip length as not every customer who resides in Keyes would travel 1.35 miles to get to the gas stations. Most residents live less than 1 mile from the project location. See Figure 2.

The results of the analysis shows that the annual emissions of ROG, NOx, CO, SO2, PM-10 and PM-2.5 are below 10 tons per year. Therefore, operational impacts are considered less than significant.

Figure 2
Default Trip Length Assumed in CalEEMod
Use of the Default Trip Length Would Mischaracterize Actual Project Trips

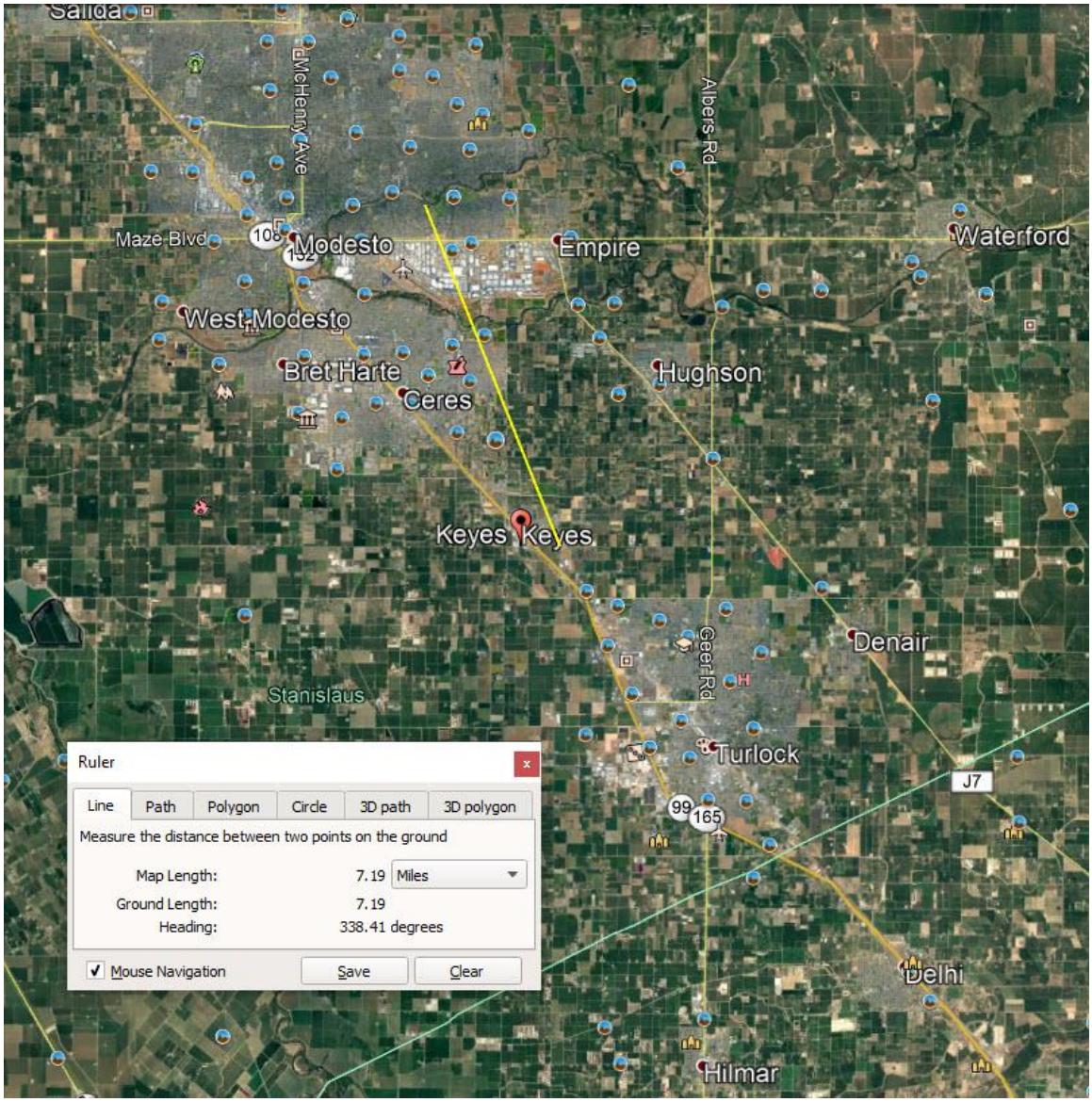


Table 5
Maximum Daily Construction Emissions

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Energy	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Mobile	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914
Total	**2.1190**	**12.1679**	**9.7915**	**0.0352**	**1.5972**	**0.0332**	**1.6304**	**0.4286**	**0.0314**	**0.4600**		**3,624.8477**	**3,624.8477**	**0.4319**	**7.8000e-004**	**3,635.8779**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 6
Maximum Daily Operational Emissions

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Energy	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Mobile	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914
Total	**2.1190**	**12.1679**	**9.7915**	**0.0352**	**1.5972**	**0.0332**	**1.6304**	**0.4286**	**0.0314**	**0.4600**		**3,624.8477**	**3,624.8477**	**0.4319**	**7.8000e-004**	**3,635.8779**

3. NUISANCE ODORS

There will not be any odor emitting activities at the proposed project. The only source of odors may be diesel exhaust emissions from fuel delivery trucks. Per state regulations, truck idling would be limited to no more than 5 minutes. Therefore, diesel exhaust from fuel delivery trucks would be limited to a few minutes on selected days when fuel is being delivered.

4. HEALTH RISK SCREENING

The health risk screening analysis involves calculating the annual and hourly emission rates of various toxic air contaminants and then using the District's recommended Prioritization Calculator to determine cancer and non-cancer risk scores.

TACs are released from on-site truck idling and gasoline dispensing and storage. In addition, we evaluated TAC emissions from off-site travel within 0.25 miles of the project location. Detailed calculation of emissions from truck idling, gasoline dispensing and store, etc. are provided in Attachment 4 and summarized in Table 7.

The results of the screening analysis shows that the cancer and non-cancer prioritization scores are 1.77 and 0.044 respectively at the nearest residence located 105 meters (0.065 miles) North of the project as shown in Figure 3. There are no schools within 1,000 feet of the project. A copy of the prioritization calculation is provided in Attachment 4 (Table 2).

Table 7
Summary of Annual Toxic Air Emissions

	On-Site Truck Idle	Off-Site Truck Travel	Off-Site Auto Travel	On-Site Gasoline Dispensing and Storage	TOTAL (lbs/yr)
Reference Appendix 4	Table 3	Tab;le 4	Table 5	Tables 6 and 7	
1,3 Butadiene			0.66		0.66
Acetaldehyde			0.55		0.55
Benzene			8.92	18.03	26.95
DPM	15.59	4.82			20.41
Ethyl Benzene				49.10	49.10
Formaldehyde			2.54		2.54
Toluene				245.52	245.52
Xylene				73.66	73.66

Figure 3
Location of Nearest Residence



Since the prioritization scores are well below the thresholds of significance, a detail health risk assessment is not required. The thresholds of significance are:

Cancer Score: 10

Non-Cancer Score: 1.0

5. AMBIENT AIR ANALYSIS

An ambient air impact analysis is not required as daily emissions of any single air pollutant will be below 100 lbs/day. An estimate of daily emissions is shown in Table 6.

6. MITIGATED NEGATIVE DECLARATION

An estimate for construction and operational emissions indicates that a mitigated negative declaration will not be required.

7. NEED FOR AN EIR

The project impacts will be less than significant since annual emissions under the construction and operational phases are well below 10 tons per year. Therefore, an EIR will not be required.

8. COMPLIANCE WITH DISTRICT RULES 2201 AND 2210

This project is subject to Rule 2201 and 2010. The applicant will submit applications for an Authority to Construct the gasoline dispensing stations prior to construction.

9. COMPLIANCE WITH DISTRICT RULE 9510 (ISR)

This project is subject to District Rule 2201 (New Source Review) however, it will be subject to the ISR rule. Since the annual NOx emissions exceed 2 tons/yr. It is our understanding that the project will be subject to emissions fees for emissions above 2 tons/year. Annual operational NOx emissions are estimated to be 2.22 tons/yr. Therefore, 0.22 tons of NOx will be subject to emission fees. We estimate these fees to be approximately $9,350/ton x 0.22 tons = $2,057. The fees will be paid pursuant to District Rule 9510.

10. COMPLIANCE WITH DISTRICT RULE 4692

The proposed project would not involve construction of under-fire charbroilers. Compliance with District Rule 4692, if applicable, will be the responsibility of future tenants occupying the two shell buildings who choose to install under-fire charbroilers. No charbroilers will be installed as part of this project.

11. COMPLIANCE WITH DISTRICT RULES

The project will be subject compliance with the following District Rules.

Rule	Description	Compliance How?
Regulation VIII	Control of Fugitive Dust	The construction contractor will adhere to Regulation VIII requirements and if necessary file a dust mitigation plan prior to start of construction No fugitive dust is expect during the operational phase as vehicle movement will occur on paved areas
Rule 4102	Nuisance	No noise or odors are expect during the operational phase. Future tenants (fat food restaurants) would be subject to nuisance requirements.
Rule 4601	Architectural Coatings	All coating will comply with the VOC limits as noted in Rule 4601.
Rule 4641	Paving and Maintenance	The paving contractor will be notified of the requirements for slow cure and/or emulsified asphalt. Rapid and medium cure cutback asphalt will not be used

If you have any questions or require additional information, please contact me at (916) 687-8352 or by e-mail: ray.kapahi@gmail.com.

Sincerely,

Ray Kapahi

Ray Kapahi
Environmental Permitting Specialists

Copies: Jeremy Ballard – County of Stanislaus
Herman Bhatti – Nunes Road Travel Plaza

Attachments 1 to 5

Attachment 1: Annual Construction and Operational Emission Calculations

Attachment 2: Traffic Data from Fehr & Pers

Attachment 3: Daily Construction and Operational Emission Calculations

Attachment 4: Toxic Emission Calculations

Attachment 5: Screening Level Risk Evaluation

Attachment 1: Annual Construction and Operational Emission Calculations

Nunes Travel Plaza

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Convenience Market With Gas Pumps	11.28	1000sqft	8.60	11,278.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	2			**Operational Year**	2021
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	833.46	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project area, Lot Size per project specifications.

Construction Phase - Per project specs

Vehicle Trips - Per traffic report. Also see Figure 2.

Off-road Equipment - Per construction schedule

Demolition -

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	11,280.00	11,278.00
tblLandUse	LotAcreage	0.26	8.60
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblVehicleTrips	CC_TL	7.30	1.35
tblVehicleTrips	CW_TL	9.50	1.35
tblVehicleTrips	DV_TP	21.00	16.00
tblVehicleTrips	PB_TP	65.00	4.00
tblVehicleTrips	PR_TP	14.00	80.00
tblVehicleTrips	ST_TR	1,448.33	86.80
tblVehicleTrips	SU_TR	1,182.08	86.80
tblVehicleTrips	WD_TR	845.60	86.80

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1679	1.5912	1.2212	2.0700e-003	0.1613	0.0870	0.2483	0.0848	0.0812	0.1660	0.0000	179.4207	179.4207	0.0465	0.0000	180.5834
2021	0.2150	1.2578	1.2233	2.0200e-003	4.1300e-003	0.0682	0.0723	1.1200e-003	0.0640	0.0651	0.0000	174.7791	174.7791	0.0422	0.0000	175.8346
Maximum	**0.2150**	**1.5912**	**1.2233**	**2.0700e-003**	**0.1613**	**0.0870**	**0.2483**	**0.0848**	**0.0812**	**0.1660**	**0.0000**	**179.4207**	**179.4207**	**0.0465**	**0.0000**	**180.5834**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1679	1.5912	1.2211	2.0700e-003	0.1613	0.0870	0.2483	0.0848	0.0812	0.1660	0.0000	179.4205	179.4205	0.0465	0.0000	180.5832
2021	0.2150	1.2578	1.2233	2.0200e-003	4.1300e-003	0.0682	0.0723	1.1200e-003	0.0640	0.0651	0.0000	174.7789	174.7789	0.0422	0.0000	175.8344
Maximum	**0.2150**	**1.5912**	**1.2233**	**2.0700e-003**	**0.1613**	**0.0870**	**0.2483**	**0.0848**	**0.0812**	**0.1660**	**0.0000**	**179.4205**	**179.4205**	**0.0465**	**0.0000**	**180.5832**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2020	8-31-2020	0.8136	0.8136
2	9-1-2020	11-30-2020	0.7016	0.7016
3	12-1-2020	2-28-2021	0.6518	0.6518
4	3-1-2021	5-31-2021	0.6436	0.6436
5	6-1-2021	8-31-2021	0.4137	0.4137
		Highest	0.8136	0.8136

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0519	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Energy	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	57.3101	57.3101	1.8800e-003	4.9000e-004	57.5035
Mobile	0.2658	2.2094	1.7929	6.0200e-003	0.2830	5.6700e-003	0.2886	0.0761	5.3400e-003	0.0815	0.0000	559.6624	559.6624	0.0745	0.0000	561.5254
Waste						0.0000	0.0000		0.0000	0.0000	6.8814	0.0000	6.8814	0.4067	0.0000	17.0484
Water						0.0000	0.0000		0.0000	0.0000	0.2651	2.3868	2.6519	0.0273	6.6000e-004	3.5313
Total	**0.3184**	**2.2159**	**1.7984**	**6.0600e-003**	**0.2830**	**6.1600e-003**	**0.2891**	**0.0761**	**5.8300e-003**	**0.0819**	**7.1465**	**619.3595**	**626.5060**	**0.5104**	**1.1500e-003**	**639.6088**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0519	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Energy	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	57.3101	57.3101	1.8800e-003	4.9000e-004	57.5035
Mobile	0.2658	2.2094	1.7929	6.0200e-003	0.2830	5.6700e-003	0.2886	0.0761	5.3400e-003	0.0815	0.0000	559.6624	559.6624	0.0745	0.0000	561.5254
Waste						0.0000	0.0000		0.0000	0.0000	6.8814	0.0000	6.8814	0.4067	0.0000	17.0484
Water						0.0000	0.0000		0.0000	0.0000	0.2651	2.3868	2.6519	0.0273	6.6000e-004	3.5313
Total	**0.3184**	**2.2159**	**1.7984**	**6.0600e-003**	**0.2830**	**6.1600e-003**	**0.2891**	**0.0761**	**5.8300e-003**	**0.0819**	**7.1465**	**619.3595**	**626.5060**	**0.5104**	**1.1500e-003**	**639.6088**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2020	6/26/2020	5	20	
2	Site Preparation	Site Preparation	6/27/2020	7/10/2020	5	10	
3	Grading	Grading	7/11/2020	8/7/2020	5	20	
4	Building Construction	Building Construction	8/8/2020	6/25/2021	5	230	
5	Paving	Paving	6/26/2021	7/23/2021	5	20	
6	Architectural Coating	Architectural Coating	7/24/2021	8/20/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 16,917; Non-Residential Outdoor: 5,639; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	1	6.00	158	0.38
Demolition	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Excavators	1	8.00	158	0.38
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Paving	Pavers	2	8.00	130	0.42
Building Construction	Welders	1	8.00	46	0.45
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9300e-003	0.1031	0.0555	1.0000e-004		5.0400e-003	5.0400e-003		4.6400e-003	4.6400e-003	0.0000	9.0319	9.0319	2.9200e-003	0.0000	9.1049
Total	**9.9300e-003**	**0.1031**	**0.0555**	**1.0000e-004**	**0.0000**	**5.0400e-003**	**5.0400e-003**	**0.0000**	**4.6400e-003**	**4.6400e-003**	**0.0000**	**9.0319**	**9.0319**	**2.9200e-003**	**0.0000**	**9.1049**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.8300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1028	1.1028	3.0000e-005	0.0000	1.1037
Total	**6.7000e-004**	**4.6000e-004**	**4.8300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.1028**	**1.1028**	**3.0000e-005**	**0.0000**	**1.1037**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9300e-003	0.1031	0.0555	1.0000e-004		5.0400e-003	5.0400e-003		4.6400e-003	4.6400e-003	0.0000	9.0319	9.0319	2.9200e-003	0.0000	9.1049
Total	**9.9300e-003**	**0.1031**	**0.0555**	**1.0000e-004**	**0.0000**	**5.0400e-003**	**5.0400e-003**	**0.0000**	**4.6400e-003**	**4.6400e-003**	**0.0000**	**9.0319**	**9.0319**	**2.9200e-003**	**0.0000**	**9.1049**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.8300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1028	1.1028	3.0000e-005	0.0000	1.1037
Total	**6.7000e-004**	**4.6000e-004**	**4.8300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.1028**	**1.1028**	**3.0000e-005**	**0.0000**	**1.1037**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.7000e-004	2.9000e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6617	0.6617	2.0000e-005	0.0000	0.6622
Total	**4.0000e-004**	**2.7000e-004**	**2.9000e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.6617**	**0.6617**	**2.0000e-005**	**0.0000**	**0.6622**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.7000e-004	2.9000e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6617	0.6617	2.0000e-005	0.0000	0.6622
Total	**4.0000e-004**	**2.7000e-004**	**2.9000e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.6617**	**0.6617**	**2.0000e-005**	**0.0000**	**0.6622**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0243	0.2639	0.1605	3.0000e-004		0.0127	0.0127		0.0117	0.0117	0.0000	26.0588	26.0588	8.4300e-003	0.0000	26.2694
Total	**0.0243**	**0.2639**	**0.1605**	**3.0000e-004**	**0.0655**	**0.0127**	**0.0783**	**0.0337**	**0.0117**	**0.0454**	**0.0000**	**26.0588**	**26.0588**	**8.4300e-003**	**0.0000**	**26.2694**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.8300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1028	1.1028	3.0000e-005	0.0000	1.1037
Total	**6.7000e-004**	**4.6000e-004**	**4.8300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.1028**	**1.1028**	**3.0000e-005**	**0.0000**	**1.1037**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0243	0.2639	0.1605	3.0000e-004		0.0127	0.0127		0.0117	0.0117	0.0000	26.0587	26.0587	8.4300e-003	0.0000	26.2694
Total	**0.0243**	**0.2639**	**0.1605**	**3.0000e-004**	**0.0655**	**0.0127**	**0.0783**	**0.0337**	**0.0117**	**0.0454**	**0.0000**	**26.0587**	**26.0587**	**8.4300e-003**	**0.0000**	**26.2694**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.8300e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.1028	1.1028	3.0000e-005	0.0000	1.1037
Total	**6.7000e-004**	**4.6000e-004**	**4.8300e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.1028**	**1.1028**	**3.0000e-005**	**0.0000**	**1.1037**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1102	0.9977	0.8761	1.4000e-003		0.0581	0.0581		0.0546	0.0546	0.0000	120.4372	120.4372	0.0294	0.0000	121.1718
Total	**0.1102**	**0.9977**	**0.8761**	**1.4000e-003**		**0.0581**	**0.0581**		**0.0546**	**0.0546**	**0.0000**	**120.4372**	**120.4372**	**0.0294**	**0.0000**	**121.1718**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0127	2.1900e-003	3.0000e-005	6.9000e-004	7.0000e-005	7.6000e-004	2.0000e-004	6.0000e-005	2.6000e-004	0.0000	2.7810	2.7810	2.4000e-004	0.0000	2.7869
Worker	9.3000e-004	6.3000e-004	6.6900e-003	2.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5292	1.5292	5.0000e-005	0.0000	1.5304
Total	**1.3200e-003**	**0.0134**	**8.8800e-003**	**5.0000e-005**	**2.3500e-003**	**8.0000e-005**	**2.4300e-003**	**6.4000e-004**	**7.0000e-005**	**7.1000e-004**	**0.0000**	**4.3102**	**4.3102**	**2.9000e-004**	**0.0000**	**4.3173**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1102	0.9977	0.8761	1.4000e-003		0.0581	0.0581		0.0546	0.0546	0.0000	120.4371	120.4371	0.0294	0.0000	121.1716
Total	**0.1102**	**0.9977**	**0.8761**	**1.4000e-003**		**0.0581**	**0.0581**		**0.0546**	**0.0546**	**0.0000**	**120.4371**	**120.4371**	**0.0294**	**0.0000**	**121.1716**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0127	2.1900e-003	3.0000e-005	6.9000e-004	7.0000e-005	7.6000e-004	2.0000e-004	6.0000e-005	2.6000e-004	0.0000	2.7810	2.7810	2.4000e-004	0.0000	2.7869
Worker	9.3000e-004	6.3000e-004	6.6900e-003	2.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5292	1.5292	5.0000e-005	0.0000	1.5304
Total	**1.3200e-003**	**0.0134**	**8.8800e-003**	**5.0000e-005**	**2.3500e-003**	**8.0000e-005**	**2.4300e-003**	**6.4000e-004**	**7.0000e-005**	**7.1000e-004**	**0.0000**	**4.3102**	**4.3102**	**2.9000e-004**	**0.0000**	**4.3173**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1198	1.0982	1.0442	1.7000e-003		0.0604	0.0604		0.0568	0.0568	0.0000	145.9315	145.9315	0.0352	0.0000	146.8117
Total	**0.1198**	**1.0982**	**1.0442**	**1.7000e-003**		**0.0604**	**0.0604**		**0.0568**	**0.0568**	**0.0000**	**145.9315**	**145.9315**	**0.0352**	**0.0000**	**146.8117**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-004	0.0140	2.3000e-003	4.0000e-005	8.3000e-004	4.0000e-005	8.7000e-004	2.4000e-004	4.0000e-005	2.8000e-004	0.0000	3.3376	3.3376	2.8000e-004	0.0000	3.3445
Worker	1.0400e-003	6.8000e-004	7.3900e-003	2.0000e-005	2.0100e-003	2.0000e-005	2.0300e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.7942	1.7942	5.0000e-005	0.0000	1.7955
Total	**1.4200e-003**	**0.0147**	**9.6900e-003**	**6.0000e-005**	**2.8400e-003**	**6.0000e-005**	**2.9000e-003**	**7.8000e-004**	**5.0000e-005**	**8.3000e-004**	**0.0000**	**5.1318**	**5.1318**	**3.3000e-004**	**0.0000**	**5.1400**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1198	1.0982	1.0442	1.7000e-003		0.0604	0.0604		0.0568	0.0568	0.0000	145.9313	145.9313	0.0352	0.0000	146.8115
Total	**0.1198**	**1.0982**	**1.0442**	**1.7000e-003**		**0.0604**	**0.0604**		**0.0568**	**0.0568**	**0.0000**	**145.9313**	**145.9313**	**0.0352**	**0.0000**	**146.8115**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-004	0.0140	2.3000e-003	4.0000e-005	8.3000e-004	4.0000e-005	8.7000e-004	2.4000e-004	4.0000e-005	2.8000e-004	0.0000	3.3376	3.3376	2.8000e-004	0.0000	3.3445
Worker	1.0400e-003	6.8000e-004	7.3900e-003	2.0000e-005	2.0100e-003	2.0000e-005	2.0300e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.7942	1.7942	5.0000e-005	0.0000	1.7955
Total	**1.4200e-003**	**0.0147**	**9.6900e-003**	**6.0000e-005**	**2.8400e-003**	**6.0000e-005**	**2.9000e-003**	**7.8000e-004**	**5.0000e-005**	**8.3000e-004**	**0.0000**	**5.1318**	**5.1318**	**3.3000e-004**	**0.0000**	**5.1400**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.1000e-004	4.4000e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0680	1.0680	3.0000e-005	0.0000	1.0687
Total	**6.2000e-004**	**4.1000e-004**	**4.4000e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0680**	**1.0680**	**3.0000e-005**	**0.0000**	**1.0687**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.1000e-004	4.4000e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0680	1.0680	3.0000e-005	0.0000	1.0687
Total	**6.2000e-004**	**4.1000e-004**	**4.4000e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0680**	**1.0680**	**3.0000e-005**	**0.0000**	**1.0687**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0784					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.0806**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	2.9000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0712	0.0712	0.0000	0.0000	0.0713
Total	**4.0000e-005**	**3.0000e-005**	**2.9000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0712**	**0.0712**	**0.0000**	**0.0000**	**0.0713**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0784					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.0806**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	2.9000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0712	0.0712	0.0000	0.0000	0.0713
Total	**4.0000e-005**	**3.0000e-005**	**2.9000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0712**	**0.0712**	**0.0000**	**0.0000**	**0.0713**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2658	2.2094	1.7929	6.0200e-003	0.2830	5.6700e-003	0.2886	0.0761	5.3400e-003	0.0815	0.0000	559.6624	559.6624	0.0745	0.0000	561.5254
Unmitigated	0.2658	2.2094	1.7929	6.0200e-003	0.2830	5.6700e-003	0.2886	0.0761	5.3400e-003	0.0815	0.0000	559.6624	559.6624	0.0745	0.0000	561.5254

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	979.10	979.10	979.10	744,015	744,015
Total	979.10	979.10	979.10	744,015	744,015

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	1.35	1.35	7.30	0.80	80.20	19.00	80	16	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.509246	0.034164	0.173036	0.129334	0.024846	0.005682	0.027468	0.086660	0.001831	0.001147	0.004743	0.000856	0.000987

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50.2686	50.2686	1.7500e-003	3.6000e-004	50.4201
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50.2686	50.2686	1.7500e-003	3.6000e-004	50.4201
NaturalGas Mitigated	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	7.0415	7.0415	1.3000e-004	1.3000e-004	7.0833
NaturalGas Unmitigated	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	7.0415	7.0415	1.3000e-004	1.3000e-004	7.0833

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	131953	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	7.0415	7.0415	1.3000e-004	1.3000e-004	7.0833
Total		**7.1000e-004**	**6.4700e-003**	**5.4300e-003**	**4.0000e-005**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**7.0415**	**7.0415**	**1.3000e-004**	**1.3000e-004**	**7.0833**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Convenience Market With Gas Pumps	131953	7.1000e-004	6.4700e-003	5.4300e-003	4.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	7.0415	7.0415	1.3000e-004	1.3000e-004	7.0833
Total		**7.1000e-004**	**6.4700e-003**	**5.4300e-003**	**4.0000e-005**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**7.0415**	**7.0415**	**1.3000e-004**	**1.3000e-004**	**7.0833**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	132968	50.2686	1.7500e-003	3.6000e-004	50.4201
Total		**50.2686**	**1.7500e-003**	**3.6000e-004**	**50.4201**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	132968	50.2686	1.7500e-003	3.6000e-004	50.4201
Total		**50.2686**	**1.7500e-003**	**3.6000e-004**	**50.4201**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0519	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Unmitigated	0.0519	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	7.8400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0441					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0519**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	7.8400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0441					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-004	2.0000e-004	0.0000	0.0000	2.1000e-004
Total	**0.0519**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.0000**	**2.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.6519	0.0273	6.6000e-004	3.5313
Unmitigated	2.6519	0.0273	6.6000e-004	3.5313

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.835538 / 0.512104	2.6519	0.0273	6.6000e-004	3.5313
Total		**2.6519**	**0.0273**	**6.6000e-004**	**3.5313**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.835538 / 0.512104	2.6519	0.0273	6.6000e-004	3.5313
Total		**2.6519**	**0.0273**	**6.6000e-004**	**3.5313**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.8814	0.4067	0.0000	17.0484
Unmitigated	6.8814	0.4067	0.0000	17.0484

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	33.9	6.8814	0.4067	0.0000	17.0484
Total		**6.8814**	**0.4067**	**0.0000**	**17.0484**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	33.9	6.8814	0.4067	0.0000	17.0484
Total		**6.8814**	**0.4067**	**0.0000**	**17.0484**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 2: Traffic Data from Fehr & Peers

Total Net New Trips		**430**	**27**	**13**	**40**	**10**	**33**	**43**
Nunes Road Travel Plaza								
Convenience Market/ Gas Station[2]	21 vehicle fueling stations	4,800	295	295	590	241	241	482
Pass-by Trips (60%)		(-2,880)	(-177)	(-177)	(-354)	(-145)	(-145)	(-290)
Diverted Trips (20% AM/30% PM & Daily)		(-1,440)	(-59)	(-59)	(-118)	(-72)	(-72)	(-144)
Fast Food Restaurant with Drive Thru[3]	4,278 sq. ft.	2,000	88	84	172	73	67	140
Pass-by Trips (50%)		(-1,000)	(-44)	(-42)	(-86)	(-37)	(-34)	(-71)
Diverted Trips (25%)		(-500)	(-22)	(-21)	(-43)	(-18)	(-17)	(-35)
Total Net New Trips		**980**	**81**	**80**	**161**	**42**	**40**	**82**
Kamir Incorporated								
Convenience Market/ Gas Station[2]	12 vehicle fueling stations	2,800	168	169	337	138	138	276
Pass-by Trips (60%)		(-1680)	(-101)	(-101)	(-202)	(-83)	(-83)	(-166)
Diverted Trips (20% AM/30% PM & Daily)		(-840)	(-34)	(-34)	(-68)	(-41)	(-41)	(-82)
Fast Food Restaurant with Drive Thru[3]	6,000 sq. ft.	2,800	123	118	241	102	94	196
Pass-by Trips (50%)		(-1400)	(-62)	(-59)	(-121)	(-51)	(-47)	(-98)
Diverted Trips (25%)		(-700)	(-31)	(-30)	(-61)	(-26)	(-24)	(-50)
Fast Food Restaurant without Drive Thru[4]	2,000 sq. ft.	700	30	20	50	28	29	57
Pass-by Trips (50%)		(-350)	(-15)	(-10)	(-25)	(-14)	(-15)	(-29)
Diverted Trips (25%)		(-180)	(-8)	(-5)	(-13)	(-7)	(-7)	(-14)
Total Net New Trips		**1,150**	**70**	**68**	**138**	**46**	**44**	**90**

Notes:

1. Based on trip generation rate observed at Peterbilt Development:
   AM = 1.14 * X (68% In, 32% Out); PM = 1.24 * X (24% In, 76% Out); Daily = 10 * PM; X = 1,000 square feet
2. Based on trip generation rates for land use 960, Super Convenience Market/Gas Station
3. Based on trip generation rates for land use 934, Fast Food Restaurant with Drive Thru
4. Based on trip generation rates for land use 933, Fast Food Restaurant without Drive Thru

Source: *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, 2017); Fehr & Peers, 2019.

Attachment 3: Daily Construction and Operational Emission Calculations

Nunes Travel Plaza

Stanislaus County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Convenience Market With Gas Pumps	11.28	1000sqft	8.60	11,278.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	2			**Operational Year**	2021
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	833.46	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project area, Lot Size per project specifications.

Construction Phase - Per project specs

Vehicle Trips - Per traffic report. Also see Figure 2.

Off-road Equipment - Per construction schedule

Demolition -

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	11,280.00	11,278.00
tblLandUse	LotAcreage	0.26	8.60
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblVehicleTrips	CC_TL	7.30	1.35
tblVehicleTrips	CW_TL	9.50	1.35
tblVehicleTrips	DV_TP	21.00	16.00
tblVehicleTrips	PB_TP	65.00	4.00
tblVehicleTrips	PR_TP	14.00	80.00
tblVehicleTrips	ST_TR	1,448.33	86.80
tblVehicleTrips	SU_TR	1,182.08	86.80
tblVehicleTrips	WD_TR	845.60	86.80

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1681	42.4677	22.1821	0.0396	18.2141	2.1985	20.4126	9.9699	2.0226	11.9925	0.0000	3,844.8964	3,844.8964	1.1969	0.0000	3,874.8190
2021	8.0646	17.6616	16.7445	0.0278	0.1232	0.9595	1.0058	0.0327	0.9021	0.9147	0.0000	2,646.8961	2,646.8961	0.7177	0.0000	2,662.4361
Maximum	**8.0646**	**42.4677**	**22.1821**	**0.0396**	**18.2141**	**2.1985**	**20.4126**	**9.9699**	**2.0226**	**11.9925**	**0.0000**	**3,844.8964**	**3,844.8964**	**1.1969**	**0.0000**	**3,874.8190**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1681	42.4677	22.1821	0.0396	18.2141	2.1985	20.4126	9.9699	2.0226	11.9925	0.0000	3,844.8964	3,844.8964	1.1969	0.0000	3,874.8190
2021	8.0646	17.6616	16.7445	0.0278	0.1232	0.9595	1.0058	0.0327	0.9021	0.9147	0.0000	2,646.8961	2,646.8961	0.7177	0.0000	2,662.4361
Maximum	**8.0646**	**42.4677**	**22.1821**	**0.0396**	**18.2141**	**2.1985**	**20.4126**	**9.9699**	**2.0226**	**11.9925**	**0.0000**	**3,844.8964**	**3,844.8964**	**1.1969**	**0.0000**	**3,874.8190**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Energy	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Mobile	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914
Total	**2.1190**	**12.1679**	**9.7915**	**0.0352**	**1.5972**	**0.0332**	**1.6304**	**0.4286**	**0.0314**	**0.4600**		**3,624.8477**	**3,624.8477**	**0.4319**	**7.8000e-004**	**3,635.8779**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Energy	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Mobile	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914
Total	**2.1190**	**12.1679**	**9.7915**	**0.0352**	**1.5972**	**0.0332**	**1.6304**	**0.4286**	**0.0314**	**0.4600**		**3,624.8477**	**3,624.8477**	**0.4319**	**7.8000e-004**	**3,635.8779**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2020	6/26/2020	5	20	
2	Site Preparation	Site Preparation	6/27/2020	7/10/2020	5	10	
3	Grading	Grading	7/11/2020	8/7/2020	5	20	
4	Building Construction	Building Construction	8/8/2020	6/25/2021	5	230	
5	Paving	Paving	6/26/2021	7/23/2021	5	20	
6	Architectural Coating	Architectural Coating	7/24/2021	8/20/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 16,917; Non-Residential Outdoor: 5,639; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Nunes Travel Plaza - Stanislaus County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	1	6.00	158	0.38
Demolition	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Excavators	1	8.00	158	0.38
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Paving	Pavers	2	8.00	130	0.42
Building Construction	Welders	1	8.00	46	0.45
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	4.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.9934	10.3087	5.5496	0.0103		0.5039	0.5039		0.4636	0.4636		995.5957	995.5957	0.3220		1,003.6456
Total	**0.9934**	**10.3087**	**5.5496**	**0.0103**	**0.0000**	**0.5039**	**0.5039**	**0.0000**	**0.4636**	**0.4636**		**995.5957**	**995.5957**	**0.3220**		**1,003.6456**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0420	0.5571	1.3400e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		133.1624	133.1624	4.2200e-003		133.2679
Total	**0.0763**	**0.0420**	**0.5571**	**1.3400e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**133.1624**	**133.1624**	**4.2200e-003**		**133.2679**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.9934	10.3087	5.5496	0.0103		0.5039	0.5039		0.4636	0.4636	0.0000	995.5957	995.5957	0.3220		1,003.6456
Total	**0.9934**	**10.3087**	**5.5496**	**0.0103**	**0.0000**	**0.5039**	**0.5039**	**0.0000**	**0.4636**	**0.4636**	**0.0000**	**995.5957**	**995.5957**	**0.3220**		**1,003.6456**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0420	0.5571	1.3400e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		133.1624	133.1624	4.2200e-003		133.2679
Total	**0.0763**	**0.0420**	**0.5571**	**1.3400e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**133.1624**	**133.1624**	**4.2200e-003**		**133.2679**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0916	0.0504	0.6685	1.6100e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		159.7949	159.7949	5.0600e-003		159.9215
Total	**0.0916**	**0.0504**	**0.6685**	**1.6100e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**159.7949**	**159.7949**	**5.0600e-003**		**159.9215**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0916	0.0504	0.6685	1.6100e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		159.7949	159.7949	5.0600e-003		159.9215
Total	**0.0916**	**0.0504**	**0.6685**	**1.6100e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**159.7949**	**159.7949**	**5.0600e-003**		**159.9215**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716		2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**		**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0420	0.5571	1.3400e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		133.1624	133.1624	4.2200e-003		133.2679
Total	**0.0763**	**0.0420**	**0.5571**	**1.3400e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**133.1624**	**133.1624**	**4.2200e-003**		**133.2679**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.4288	26.3859	16.0530	0.0297		1.2734	1.2734		1.1716	1.1716	0.0000	2,872.4851	2,872.4851	0.9290		2,895.7106
Total	**2.4288**	**26.3859**	**16.0530**	**0.0297**	**6.5523**	**1.2734**	**7.8258**	**3.3675**	**1.1716**	**4.5390**	**0.0000**	**2,872.4851**	**2,872.4851**	**0.9290**		**2,895.7106**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0420	0.5571	1.3400e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		133.1624	133.1624	4.2200e-003		133.2679
Total	**0.0763**	**0.0420**	**0.5571**	**1.3400e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**133.1624**	**133.1624**	**4.2200e-003**		**133.2679**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4100e-003	0.2411	0.0390	5.7000e-004	0.0135	1.2800e-003	0.0148	3.9000e-003	1.2300e-003	5.1200e-003		59.7060	59.7060	4.7400e-003		59.8244
Worker	0.0204	0.0112	0.1486	3.6000e-004	0.0329	2.5000e-004	0.0331	8.7200e-003	2.3000e-004	8.9400e-003		35.5100	35.5100	1.1300e-003		35.5381
Total	**0.0278**	**0.2523**	**0.1876**	**9.3000e-004**	**0.0464**	**1.5300e-003**	**0.0479**	**0.0126**	**1.4600e-003**	**0.0141**		**95.2160**	**95.2160**	**5.8700e-003**		**95.3625**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	7.4100e-003	0.2411	0.0390	5.7000e-004	0.0135	1.2800e-003	0.0148	3.9000e-003	1.2300e-003	5.1200e-003		59.7060	59.7060	4.7400e-003		59.8244
Worker	0.0204	0.0112	0.1486	3.6000e-004	0.0329	2.5000e-004	0.0331	8.7200e-003	2.3000e-004	8.9400e-003		35.5100	35.5100	1.1300e-003		35.5381
Total	**0.0278**	**0.2523**	**0.1876**	**9.3000e-004**	**0.0464**	**1.5300e-003**	**0.0479**	**0.0126**	**1.4600e-003**	**0.0141**		**95.2160**	**95.2160**	**5.8700e-003**		**95.3625**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.9900e-003	0.2195	0.0337	5.6000e-004	0.0135	5.9000e-004	0.0141	3.9000e-003	5.6000e-004	4.4600e-003		59.1456	59.1456	4.5700e-003		59.2600
Worker	0.0188	9.9700e-003	0.1356	3.5000e-004	0.0329	2.4000e-004	0.0331	8.7200e-003	2.2000e-004	8.9400e-003		34.3866	34.3866	1.0100e-003		34.4119
Total	**0.0248**	**0.2295**	**0.1693**	**9.1000e-004**	**0.0464**	**8.3000e-004**	**0.0472**	**0.0126**	**7.8000e-004**	**0.0134**		**93.5322**	**93.5322**	**5.5800e-003**		**93.6718**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.9900e-003	0.2195	0.0337	5.6000e-004	0.0135	5.9000e-004	0.0141	3.9000e-003	5.6000e-004	4.4600e-003		59.1456	59.1456	4.5700e-003		59.2600
Worker	0.0188	9.9700e-003	0.1356	3.5000e-004	0.0329	2.4000e-004	0.0331	8.7200e-003	2.2000e-004	8.9400e-003		34.3866	34.3866	1.0100e-003		34.4119
Total	**0.0248**	**0.2295**	**0.1693**	**9.1000e-004**	**0.0464**	**8.3000e-004**	**0.0472**	**0.0126**	**7.8000e-004**	**0.0134**		**93.5322**	**93.5322**	**5.5800e-003**		**93.6718**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0705	0.0374	0.5085	1.3000e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		128.9497	128.9497	3.7900e-003		129.0445
Total	**0.0705**	**0.0374**	**0.5085**	**1.3000e-003**	**0.1232**	**8.9000e-004**	**0.1241**	**0.0327**	**8.2000e-004**	**0.0335**		**128.9497**	**128.9497**	**3.7900e-003**		**129.0445**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0705	0.0374	0.5085	1.3000e-003	0.1232	8.9000e-004	0.1241	0.0327	8.2000e-004	0.0335		128.9497	128.9497	3.7900e-003		129.0445
Total	**0.0705**	**0.0374**	**0.5085**	**1.3000e-003**	**0.1232**	**8.9000e-004**	**0.1241**	**0.0327**	**8.2000e-004**	**0.0335**		**128.9497**	**128.9497**	**3.7900e-003**		**129.0445**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	7.8410					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**8.0599**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.7000e-003	2.4900e-003	0.0339	9.0000e-005	8.2100e-003	6.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		8.5967	8.5967	2.5000e-004		8.6030
Total	**4.7000e-003**	**2.4900e-003**	**0.0339**	**9.0000e-005**	**8.2100e-003**	**6.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**8.5967**	**8.5967**	**2.5000e-004**		**8.6030**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	7.8410					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**8.0599**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.7000e-003	2.4900e-003	0.0339	9.0000e-005	8.2100e-003	6.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		8.5967	8.5967	2.5000e-004		8.6030
Total	**4.7000e-003**	**2.4900e-003**	**0.0339**	**9.0000e-005**	**8.2100e-003**	**6.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**8.5967**	**8.5967**	**2.5000e-004**		**8.6030**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914
Unmitigated	1.8307	12.1325	9.7606	0.0350	1.5972	0.0305	1.6277	0.4286	0.0287	0.4573		3,582.3142	3,582.3142	0.4311		3,593.0914

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	979.10	979.10	979.10	744,015	744,015
Total	979.10	979.10	979.10	744,015	744,015

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Convenience Market With Gas	1.35	1.35	7.30	0.80	80.20	19.00	80	16	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.509246	0.034164	0.173036	0.129334	0.024846	0.005682	0.027468	0.086660	0.001831	0.001147	0.004743	0.000856	0.000987

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
NaturalGas Unmitigated	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	361.514	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Total		**3.9000e-003**	**0.0354**	**0.0298**	**2.1000e-004**		**2.6900e-003**	**2.6900e-003**		**2.6900e-003**	**2.6900e-003**		**42.5311**	**42.5311**	**8.2000e-004**	**7.8000e-004**	**42.7838**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market With Gas Pumps	0.361514	3.9000e-003	0.0354	0.0298	2.1000e-004		2.6900e-003	2.6900e-003		2.6900e-003	2.6900e-003		42.5311	42.5311	8.2000e-004	7.8000e-004	42.7838
Total		**3.9000e-003**	**0.0354**	**0.0298**	**2.1000e-004**		**2.6900e-003**	**2.6900e-003**		**2.6900e-003**	**2.6900e-003**		**42.5311**	**42.5311**	**8.2000e-004**	**7.8000e-004**	**42.7838**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Unmitigated	0.2844	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0430					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2414					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1000e-004	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Total	**0.2844**	**1.0000e-005**	**1.1600e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.4700e-003**	**2.4700e-003**	**1.0000e-005**		**2.6300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0430					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2414					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1000e-004	1.0000e-005	1.1600e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.4700e-003	2.4700e-003	1.0000e-005		2.6300e-003
Total	**0.2844**	**1.0000e-005**	**1.1600e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.4700e-003**	**2.4700e-003**	**1.0000e-005**		**2.6300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 4: Toxic Emission Calculations

Table 1
Summary of TAC Emissions

	On-Site Truck Idle	Off-Site Truck Travel	Off-Site Auto Travel	On-Site Gasoline Dispensing and Storage	TOTAL (lbs/yr)
Reference Appendix 4	Table 3	Table 4	Table 5	Tables 6 and 7	
1,3 Butadiene			0.66		0.66
Acetaldehyde			0.55		0.55
Benzene			8.92	18.03	26.95
DPM	15.59	4.82			20.41
Ethyl Benzene				49.10	49.10
Formaldehyde			2.54		2.54
Toluene				245.52	245.52
Xylene				73.66	73.66

Table 2
Results of Screening Level Health Risk Analysis

Name	Prioritization Calculator			
Applicability	Use to provide a Prioritization score based on the emission potency method. Entries required in yellow areas, output in grey areas.			
Author or updater	Matthew Cegielski	*Last Update*	August 20, 2018	
Facility: **ID#:** **Project #:** **Unit and Process#**	NunesTravel Plaza Risk Score Calculation Keyes, CA			

Operating Hours hr/yr	8,760.00			
Receptor Proximity and Proximity Factors	**Cancer Score**	**Chronic Score**	**Acute Score**	**Max Score**
0< R<100 1.000	7.09E+00	1.73E-01	1.76E-01	7.09E+00
100≤R<250 0.250	1.77E+00	4.32E-02	4.40E-02	1.77E+00
250≤R<500 0.040	2.84E-01	6.92E-03	7.04E-03	2.84E-01
500≤R<1000 0.011	7.80E-02	1.90E-03	1.94E-03	7.80E-02
1000≤R<1500 0.003	2.13E-02	5.19E-04	5.28E-04	2.13E-02
1500≤R<2000 0.002	1.42E-02	3.46E-04	3.52E-04	1.42E-02
2000<R 0.001	7.09E-03	1.73E-04	1.76E-04	7.09E-03

Receptor proximity is in meters. Priortization scores are calculated by multiplying the total scores summed below by the proximity factors. Record the Max score for your receptor distance. If the substance list for the unit is longer than the number of rows here or if there are multiple processes use additional worksheets and sum the totals of the Max Scores.

0	Enter the unit's CAS# of the substances emitted and their amounts.				Prioritzation score for each substance generated below. Totals on last row.		
Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**	**Average Hourly (lbs/hr)**	**Cancer**	**Chronic**	**Acute**
1,3 Butadiene	**106990**	6.60E-01	7.55E-05	7.53E-05	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	**75070**	5.50E-01	6.23E-05	6.28E-05	1.14E-02	6.73E-05	1.99E-04
Benzene	**71432**	2.70E+01	3.00E-03	3.08E-03	6.02E+00	1.54E-01	1.67E-01
DPM	**9901**	2.04E+01	2.30E-03	2.33E-03	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	**100414**	4.91E+01	5.60E-03	5.61E-03	9.45E-01	4.20E-04	0.00E+00
Formaldehyde	**50000**	2.45E+00	2.90E-04	2.80E-04	1.13E-01	4.66E-03	7.91E-03
Toluene	**108883**	2.46E+02	2.80E-02	2.80E-02	0.00E+00	1.40E-02	1.14E-03
Xylene	**1330207**	7.37E+01	8.40E-03	8.41E-03	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				Totals	**7.09E+00**	**1.73E-01**	**1.76E-01**

Use the substance dropdown list in the CAS# Finder to locate CAS# of substances.

Substance	CAS# Finder
Vinylidene chloride	75354

Table 3
Calculation of DPM Emissions from
Idling of Diesel Fuelled Trucks

IDLING EMISSIONS FUEL DELIVERY	Units	
Deliveries per year (50 deliveried/month)		600
Idle Time per Truck (min)	*min*	5
Total Annual Idle Time	*min*	3000
		50.0
Emission Factor for Truck Idling (Note 1)	*(grams/hr)*	0.123
Idling Emissions All Trucks	*(grams/yr)*	6.15
	(lbs/yr)	0.0135

IDLING EMISSIONS FROM HD TRUCKS RE-FUELING	Units	
Number of re-fueling trucks per day	*(trucks/day)*	30
Idle time 1 truck	*(min)*	5
Idle time all trucks	*(min/day)*	150
	(hrs/day)	2.50
	(hrs/yr)	912.5
Emission Factor for Truck Idling (Note 1)	*(grams/hr)*	0.123
Idling Emissions All Trucks	*(grams/yr)*	112.2375
	(lbs/yr)	0.2472

EMISSIONS FROM TRUs		Units	
TRU Count			1.59
Assume 5.3% of trucks have TRUs			
Average TRU Engine Size		*hp*	25
Emission Factor for TRUs (Note 2)		*(grams/hp-hr)*	0.02
TRU Emissions	per truck	*(grams/hr)*	0.5
	all trucks	*(grams/hr)*	0.8
	all trucks	*(lbs/hr)*	0.002
		(lbs/yr)	15.3
Total (Idling +TRUs)			15.59

Note 1. From EMFAC 2011 Idle EFs for various vehicle types and air districts

CY	EMFAC2007 Vehicle Ca	Fuel_Typ	air_basi	season	HC (g/hr-v	CO (g/hr-ve	NOX (g	PM10 (g/hr-veh)	PM2.5 (g/hr-veh	CO2 (g
2020	HHDT	D	NEP	s	5.273847479	28.7827361	45.703218	0.117257036	0.107876473	7452.596
2020	HHDT	D	NEP	w	6.041237826	54.56350484	42.311895	0.169250173	0.155710159	6457.5
2020	HHDT	D	SC	a	5.318626375	37.90816039	47.219829	0.116801038	0.107456955	7042.896
2020	HHDT	D	SC	s	5.012306167	27.54563051	48.738789	0.098463833	0.090586726	7461.326
2020	HHDT	D	SC	w	5.741639996	52.21832068	45.122217	0.142123844	0.130753937	6465.065
2020	HHDT	D	SCC	a	5.241959324	36.9400936	51.070483	0.153637104	0.141346135	7041.806
2020	HHDT	D	SCC	s	4.940054668	26.84219332	52.713311	0.129516812	0.119155467	7460.171
2020	HHDT	D	SCC	w	5.658875279	50.88481303	48.801817	0.186946077	0.171990391	6464.063
2020	HHDT	D	SD	a	5.324889077	37.91755434	47.530144	0.120807823	0.111143197	7044.37
2020	HHDT	D	SD	s	5.018208176	27.55245655	49.059086	0.101841572	0.093694246	7462.888
2020	HHDT	D	SD	w	5.748400797	52.23126082	45.418747	0.146999312	0.135239367	6466.417
2020	HHDT	D	SF	a	5.325775021	37.88786118	47.70744	0.123774674	0.1138727	7043.954
2020	HHDT	D	SF	s	5.019043095	27.53088028	49.242086	0.104342642	0.09599523	7462.446
2020	HHDT	D	SF	w	5.749357204	52.19035862	45.588168	0.150609386	0.138560635	6466.035
2020	HHDT	D	SJV	a	5.518568251	39.14631056	45.341775	0.133419159	0.122745626	7039.998
2020	HHDT	D	SJV	s	5.200732619	28.44532142	46.800323	0.112472989	0.10347515	7458.256
2020	HHDT	D	SJV	w	5.957484123	53.92386699	43.327591	0.162344823	0.149357237	6462.404

Note 2. TRU Emission Factors (EFs) applicable to Ultra Low Emission Standard effective 2020.
Information available at: https://ww3.arb.ca.gov/regact/trude03/uid.pdf. Page 3

Table 4
Calculation of DPM Emissions from
Truck Travel within 0.25 Miles of Truck Stop

Daily Vehicle Count	*(vehicles/day)*	30
Fraction Trucks		25%
	(trucks/day)	8
	(trucks/yr)	2,738
Emission Factor EMFAC 2017 (Note 1)	*(grams/mile)*	0.1053
Distance Travelled	*(mile/truck)*	0.25
	(total miles)	684
Emissions of DPM	*(grams/yr)*	2,190
	(lbs/yr)	4.82

Note 1:
Emissions based on EMFAC 2017 Aggregate statewide for HD trucks
Excerts of EMFAC 2017 Model appear below.

Table 5
Calculation of Toxic Emissions from Automobile Traffic

No. of Vehicles per Day	980	veh/day total
	357,700	veh/yr total
	178,850	veh/yr per 0.25 mile segment
Length of Roadway	0.25	mile
Annual Miles per Roadway Segment	44,713	miles/yr per 0.25 mile segment

	EF	Emission Rate (Vehicle Travel)			Emission Rate (vehicle travel + idle + start-up/shut down)
TAC	(mg/mile)	(mg/yr)	(g/yr)	(lb/yr)	(lb/yr)
1,3 Butadiene	4.48	200,312	200.312	0.441	0.6618
Benzene	45.28	2,024,582	2024.582	4.459	8.9189
Formaldehyde	12.87	575,450	575.450	1.268	2.5350
Acetaldehyde	2.77	123,854	123.854	0.273	0.5456

NOTES

1. Emission Factors From: Zhu, Durbin, Norbeck and Cocker (July 2004)
"Internal Combustion Engine (ICE) Air Toxic Emissions"
Final Report to Research Division CARB, Sacramento, CA

2. Emissions from Vehicle Idle + start-up and shut-down estimated to equal 50% of emissions from vehicle travel

Table 5
Calculation of Toxic Emissions from Automobile Traffic

No. of Vehicles per Day	980	veh/day total
	357,700	veh/yr total
	178,850	veh/yr per 0.25 mile segment
Length of Roadway	0.25	mile
Annual Miles per Roadway Segment	44,713	miles/yr per 0.25 mile segment

	EF	Emission Rate (Vehicle Travel)			Emission Rate (vehicle travel + idle + start-up/shut down)
TAC	(mg/mile)	(mg/yr)	(g/yr)	(lb/yr)	(lb/yr)
1,3 Butadiene	4.48	200,312	200.312	0.441	0.6618
Benzene	45.28	2,024,582	2024.582	4.459	8.9189
Formaldehyde	12.87	575,450	575.450	1.268	2.5350
Acetaldehyde	2.77	123,854	123.854	0.273	0.5456

NOTES

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2. Emissions from Vehicle Idle + start-up and shut-down estimated to equal 50% of emissions from vehicle travel

Table 6
Calculation of VOC Emissions

Gasoline Dispensing Operations VOC Calculator

Applicability	Use this spreadsheet to calculate VOC emissions from gasoline dispensing operations. Entries required in yellow areas, output in grey areas.		
Author or updater	Matthew Cegielski	*Last Update*	January 25, 2017
Facility: **ID#:** **Project #:**	Nunes Travel Plaza Keyes, CA		

Inputs	gal/day	gal/yr	**Formula**
	5.00E+03	3.00E+06	
	1,000 gal /hr	1,000 gal /yr	
Gasoline Throughput	2.08E-01	3.00E+03	Enter the **change** in gas station throughput in units of gallons/day and gallons/yr. Select the Phase I and Phase II type using the drop down provided. VOC emissions are calculated by the multiplication of Throughput Rates and Emission Factors.
Application Type	Type #		
EVR Phase I and EVR Phase II (VR-501 only) Installed Aboveground tank	6		

Substances	**lb VOC/ 1,000 gal**	**LB/HR**	**LB/YR**
Vapor Tank Filling Loss VOC	0.17	3.54E-02	5.10E+02
Vehicle Refueling VOC	0.38	7.92E-02	1.14E+03
Breathing Loss VOC	0.05	1.10E-02	1.59E+02
Spillage VOC	0.42	8.75E-02	1.26E+03
Total VOC	1.02	2.13E-01	3.07E+03

References:

* The emission factors are derived from Appendix A in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asesssment Guidelines* .

Table 6
Calculation of VOC Emissions

	1	2	3	4	5	6	**7**
	Phase 1 and Phase II Exempt Aboveground tank	Non-EVR Phase I and Phase II Exempt Aboveground tank	EVR Phase I and Phase II Exempt Aboveground tank	Non-EVR Phase I and Non-EVR Phase II Installed Aboveground tank	EVR Phase I and Non-EVR Phase II Installed (or Phase II Exempt Due to ORVR) Aboveground tank	EVR Phase I and EVR Phase II (VR-501 only) Installed Aboveground tank	**Phase I and Phase II Exempt Underground Tank**
Process							lb VOC/1,000 gal
Tank Filling Loss	8.4	0.42	0.17	0.42	0.17	0.17	8.4
Vehicle Refueling	8.4	8.4	8.4	0.42	0.42	0.38	8.4
Breathing Loss	2.1	0.053	0.053	0.053	0.053	0.053	0.84
Vapor VOC EF	18.90	8.87	8.62	0.89	0.64	0.60	17.64
Spillage	0.61	0.42	0.42	0.42	0.42	0.42	0.61
Total VOC	19.51	9.29	9.04	1.31	1.06	1.02	18.25

1	Phase 1 and Phase II Exempt Aboveground tank
2	Non-EVR Phase I and Phase II Exempt Aboveground tank
3	EVR Phase I and Phase II Exempt Aboveground tank
4	Non-EVR Phase I and Non-EVR Phase II Installed Aboveground tank
5	EVR Phase I and Non-EVR Phase II Installed (or Phase II Exempt Due to ORVR) Aboveground Tank
6	EVR Phase I and EVR Phase II (VR-501 only) Installed Aboveground tank

Table 7
Calculation of TACs from Gasoline Storage Tank Filling

	lbs/hr	lbs/yr	
Total Vapor VOCs (Re-Fuel) Less Spillage	1.26E-01	1.81E+03	*(From Table 1)*
Total Liquid VOCs (Spillage)	8.75E-02	1.26E+03	*(From Table 1)*
TOTAL VOCs	0.213	3069	

	Benzene	**Ethyl Benzene**	**Toluene**	**Xylenes**
EF Vapor (lbs/lb VOC)	3.00E-03	1.60E-02	8.00E-02	2.40E-02
Emissions (lbs/hr)	3.77E-04	2.01E-03	1.01E-02	3.02E-03
Emissions (lbs/yr)	5.43E+00	2.89E+01	1.45E+02	4.34E+01
EF Liquid (lb/lb VOC)	1.00E-02	1.60E-02	8.00E-02	2.40E-02
Emissions (lbs/hr)	8.75E-04	1.40E-03	7.00E-03	2.10E-03
Emissions (lbs/yr)	1.26E+01	2.02E+01	1.01E+02	3.02E+01
Total (lbs/hr)	1.25E-03	3.41E-03	1.71E-02	5.12E-03
Total (lbs/yr)	1.80E+01	4.91E+01	2.46E+02	7.37E+01

EFs from SJVAPCD Speciation Guidance March 27, 2017.

Environmental Noise & Vibration Assessment

Nunes Road Travel Plaza

Stanislaus County, California

BAC Job # 2020-120

Prepared For:

KB Realtors

Attn: Herman Bhatti

Prepared By:

Bollard Acoustical Consultants, Inc.

Dario Gotchet, Senior Consultant

August 19, 2020

BOLLARD
Acoustical Consultants

CEQA Checklist

NOISE AND VIBRATION **– Would the Project Result in:**	**NA – Not Applicable**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			**X**		
b) Generation of excessive groundborne vibration or groundborne noise levels?				**X**	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?					**X**

Introduction

The proposed Nunes Travel Plaza (project) is located south of Nunes Road, between Golden State Boulevard and Keyes Road in Stanislaus County, California. Existing land uses in the immediate project vicinity include residential to the north, agricultural to the south and west, and future development to the east. The project site location and site plan are shown on Figures 1 and 2, respectively.

The project proposes the rezoning of an 8.6-acre parcel from General Agriculture to Planned Development to allow for the development of various commercial uses. Specifically, the project proposes the construction of a convenience store, gas station, and a fast food restaurant with drive-through services. The project also proposes the construction of truck-related uses that would include a wash station, repair building, parking stalls, and diesel fueling station. Finally, the project proposes to provide three points of access to the parcel to the east planned for future development.

The project will be developed in four phases over an eight-year period. The truck wash building and truck parking area will be constructed in Phase 1. Phase 2 will construct the convenience store, gas station, and associated parking stalls. Phase 3 will construct the diesel fueling station, and Phase 4 will construct the buildings for future food services.

The purposes of this assessment are to quantify the existing noise and vibration environments, identify potential noise and vibration impacts resulting from the project, identify appropriate mitigation measures, and provide quantitative and qualitative analyses of impacts associated with the project. Specifically, impacts are identified if project-related activities would cause a substantial increase in ambient noise or vibration levels at existing sensitive uses in the project vicinity. An impact would also be identified if project-generated noise or vibration levels would exceed applicable Stanislaus County standards at existing noise-sensitive uses in the project vicinity.

Noise and Vibration Fundamentals

Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are designated as sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or Hertz (Hz). Definitions of acoustical terminology are provided in Appendix A.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels

correspond closely to human perception of relative loudness. Noise levels associated with common noise sources are provided in Figure 3.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by filtering the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}). The L_{eq} is the foundation of the day-night average noise descriptor, DNL (or L_{dn}), and shows very good correlation with community response to noise.

The day-night average sound level (DNL) is based on the average noise level over a 24-hour day, with a +10-decibel weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of velocity in inches per second peak particle velocity (IPS, PPV) or root-mean-square (VdB, RMS). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity as well as RMS velocities.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance. The maximum rate, or velocity of particle movement, is the commonly accepted descriptor of the vibration "strength".

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, June 2004), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. However, traffic, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.



Legend

Project Border (Approximate)

Long-Term Noise & Short-Term Vibration Measurement Locations

N

Scale (feet)

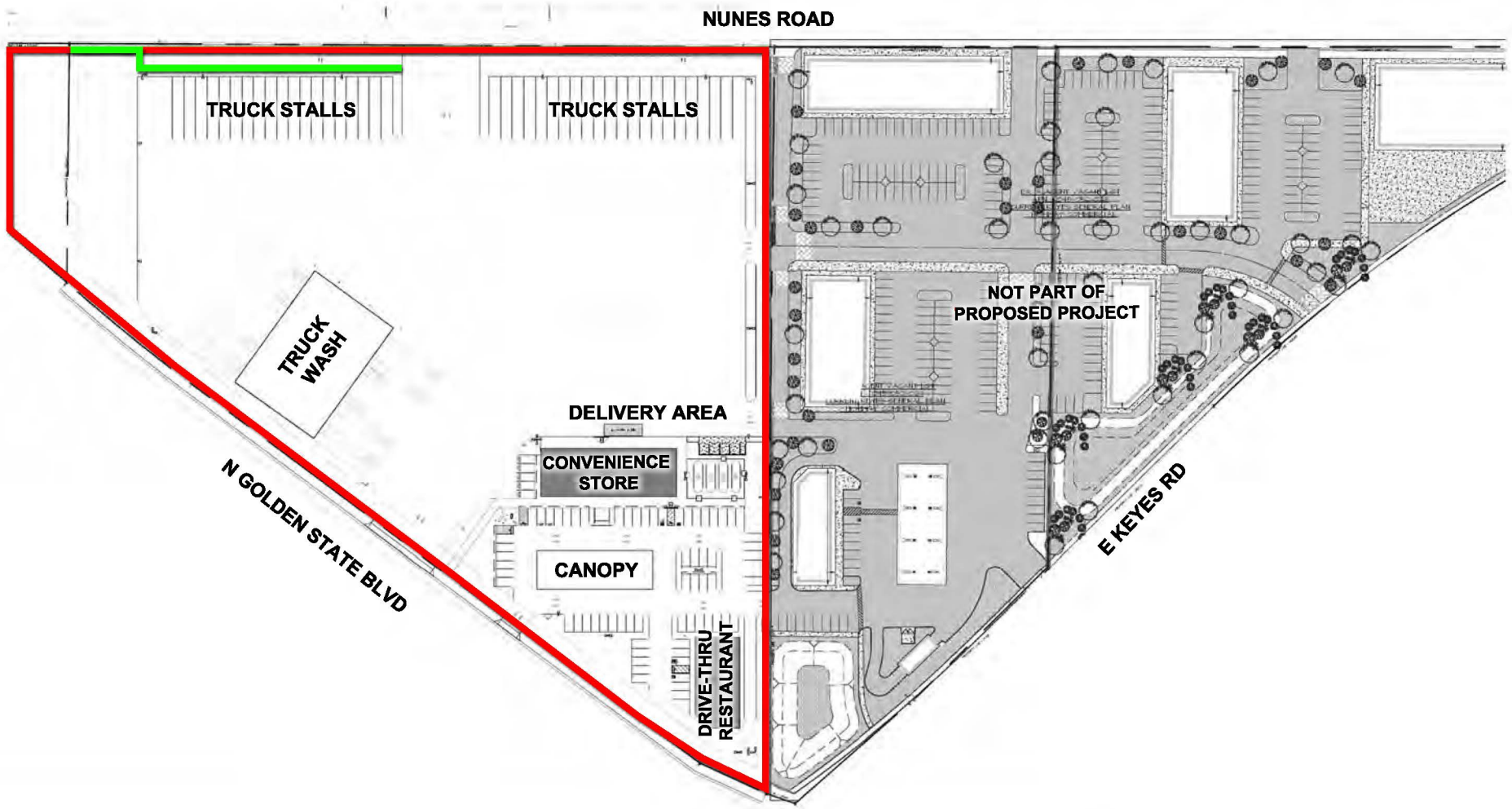
0 150 300

Nunes Road Travel Plaza
Stanislaus County, California

Project Area

Figure 1

BOLLARD Acoustical



Legend

- Project Boundary
- Recommended 7' Solid Noise Barrier

N

Scale (feet)

0 75 150

Nunes Road Travel Plaza

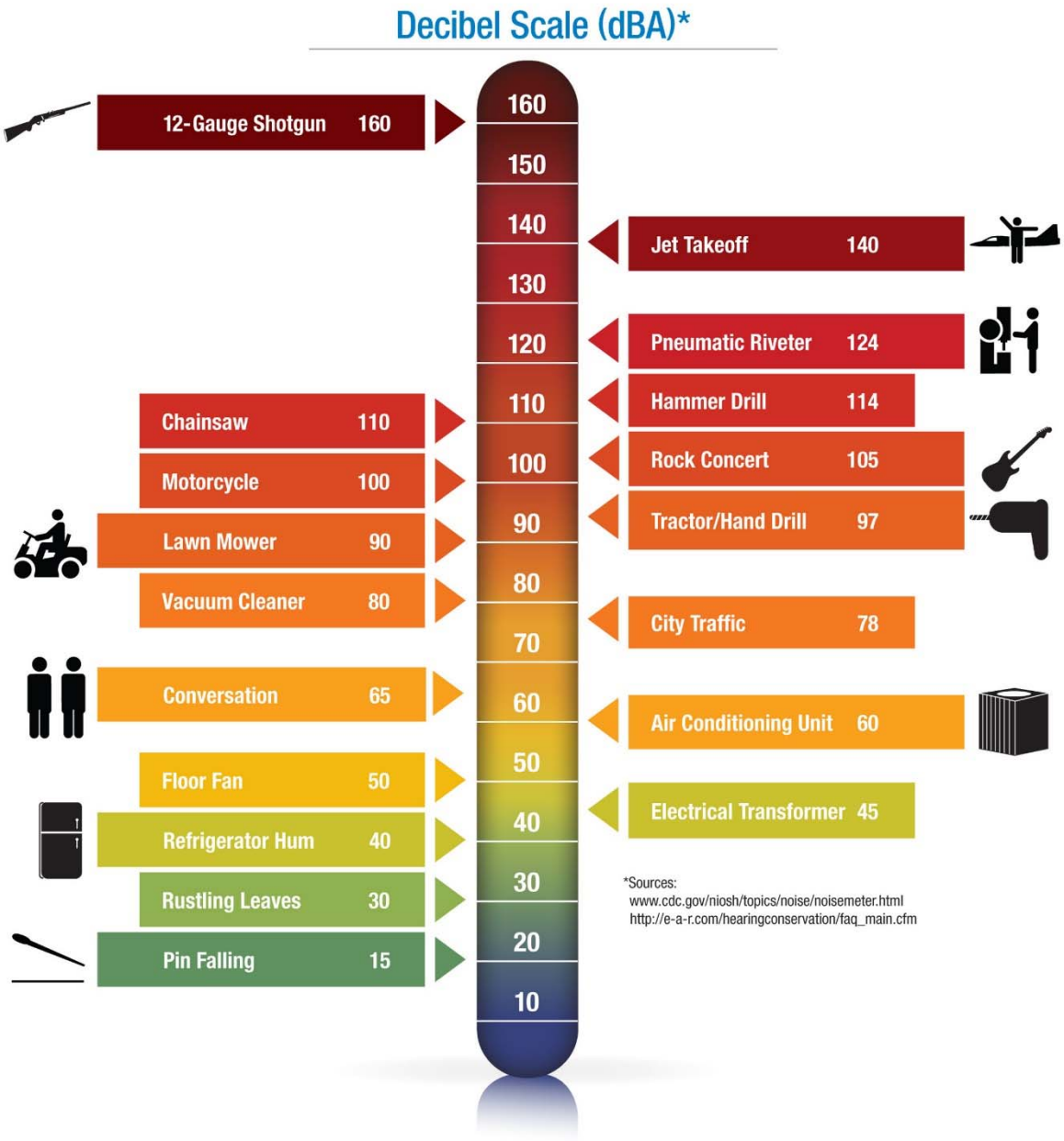
Stanislaus County, California

Site Plan

Figure 2

BOLLARD Acoustical

Figure 3
Noise Levels Associated with Common Noise Sources



Regulatory Setting: Criteria for Acceptable Noise and Vibration Exposure

Federal

There are no federal noise or vibration criteria which would be directly applicable to this project.

State of California

California Environmental Quality Act (CEQA)

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following occur:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies?

B. Generation of excessive groundborne vibration or groundborne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

Local

Stanislaus County General Plan

The Noise Element of the Stanislaus County General Plan contains goals, policies, and implementation measures related to noise. The specific goals, policies, and implementation measures which are generally applicable to this project are reproduced below.

Policy 1

It is the policy of Stanislaus County to utilize the noise exposure information contained within the General Plan to identify existing and potential noise conflicts through the Lane Use Planning and Project Review processes.

Implementation Measure

1. Areas within Stanislaus County shall be designated as noise-impacted if exposed to existing or projected future noise levels exterior to buildings exceeding the standards in Table 1 (General Plan Figure IV-2).

Policy 2

It is the policy of Stanislaus County to develop and implement effective measures to abate and avoid excessive noise exposure in the unincorporated areas of the County by requiring that effective noise mitigation measures be incorporated into the design of new noise generating and new noise sensitive land uses.

Implementation Measures

1. New development of noise-sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the following levels:

    a. For transportation noise sources such as traffic on public roadways, railroads, and airports, 60 L_{dn} (or CNEL) or less in outdoor activity areas of single-family residences, 65 L_{dn} (or CNEL) or less in community outdoor space for multi-family residences, and 45 L_{dn} (or CNEL) or less within noise-sensitive interior spaces. Where it is not possible to reduce exterior noise due to these sources to the prescribed level using a practical application of the best available noise-reduction technology, an exterior noise level of up to 65 L_{dn} (or CNEL) will be allowed. Under no circumstances will interior noise levels be allowed to exceed 45 L_{dn} (or CNEL) with the windows and doors closed in residential uses.

    b. For other noise sources such as local industries or other stationary noise sources, noise levels shall not exceed the performance standards contained within Table 1 (General Plan Table IV-2).

2. New development of industrial, commercial, or other noise generating land uses will not be permitted if resulting noise levels will exceed 60 L_{dn} (or CNEL) in noise-sensitive areas. Additionally, the development of new noise-generating land uses, which are not preempted from local noise regulation, will not be permitted if resulting noise levels will exceed the performance standards contained within Table 2 in areas containing residential or other noise sensitive land uses.

Table 1
Normally Accepted Community Noise Environments

Land Use Category	Exterior Noise Exposure Ldn or CNEL, dBA					
	55	60	65	70	75	80
*Residential – Low Density Single Family, Duplex, and Mobile Homes						
*Multi-Family Residential						
Hotels and Motels						
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches						
Auditoriums, Concert Halls, and Amphitheaters						
Sports Arena and Outdoor Spectator Sports						
Playgrounds and Neighborhood Parks						
Golf Courses, Riding Stables, Water Recreation, and Cemeteries						
Office Buildings, Business Commercial, and Professional						
Industrial, Manufacturing, Utilities, and Agriculture						

** Residential development sites exposed to noise levels exceeding 60 Ldn shall be analyzed following protocols in Appendix Chapter 12, Section 1208A, Sound Transmission Control, California Building Code.*

NORMAL ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements.

CONDITIONALLY ACCEPTABLE
Specified land use may be permitted only after detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Table 2
Maximum Allowable Noise Exposure – Stationary Noise Sources

Noise Level Descriptor	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq}, dBA	55	45
Maximum level (L_{max}), dBA	75	65
Source: Stanislaus County General Plan, Noise Element, Table IV-2		

Each of the noise level standards specified in Table 2 shall be reduced by five (5) dBA for pure tone noises, noise consisting primarily of speech or music, or for recurring impulsive noises. The standards in Table 2 should be applied at a residential or other noise-sensitive land use and not on the property of a noise-generating land use. Where measured ambient noise levels exceed the standards, the standards shall be increased to the ambient levels.

3. Prior to the approval of a proposed development of noise-sensitive land uses in a noise impacted area, or the development of industrial, commercial, or other noise-generating land use in an area containing noise-sensitive land uses, an acoustical analysis shall be required. Where required, an acoustical analysis shall:
    a. Be the responsibility of the applicant.
    b. Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.
    c. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
    d. Include estimated noise levels in terms of L_{dn} (or CNEL) and the standards of Table 2 (if applicable) for existing and projected future (10-20 years hence) conditions, with a comparison made to the adopted polices of the Noise Element.
    e. Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
    f. Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.

4. Projects which go through the CEQA review process require an acoustical analysis shall include a monitoring program to specifically implement the recommended mitigation to noise impacts associated with the project.

5. Noise level criteria applied to land uses other than noise sensitive uses shall be consistent with the recommendations of Figure IV-2: Normally Accepted Community Noise Environments.

Policy 3

It is the objective of Stanislaus County to protect areas of the County where noise-sensitive land uses are located.

Implementation Measures

1. Require the evaluation of mitigation measures for projects that would cause the L_{dn} at noise-sensitive uses to increase by 3 dBA or more and exceed the normally acceptable level, cause the L_{dn} at noise-sensitive uses to increase 5 dBA or more and remain normally acceptable, or cause new noise levels to exceed the noise ordinance limits (after adoption).

Policy 4

It is the objective of Stanislaus County to ensure that the Noise Element is consistent with and does not conflict with other elements of the Stanislaus County General Plan or adopted Airport Land Use Compatibility Plan(s) (ALUCP).

Implementation Measures

1. Update the Stanislaus County Noise Control Ordinance as necessary to be consistent with the General Plan and/or adopted Airport Land Use Compatibility Plan(s) (ALUCP).

Stanislaus County Code

The Stanislaus County Code (Chapter 10.46 – Noise Control) contains criteria that would be applicable to the project. The code sections which are generally applicable to this project are reproduced below.

10.46.050 Exterior noise level standards.

A. It is unlawful for any person at any location within the unincorporated area of the county to create any noise or to allow the creation of any noise which causes the exterior noise level when measured at any property situated in either the incorporated or unincorporated area of the county to exceed the noise level standards as set forth below:

1. Unless otherwise provided herein, the following noise level standards (Table 3) shall apply to all properties within the designated noise zone:

Table 3
Exterior Noise Level Standards

	Maximum A-Weighted Sound Level (dBA)	
Designated Noise Zone	**Daytime (7:00 a.m. to 9:59 p.m.)**	**Nighttime (10:00 p.m. to 6:59 a.m.)**
Noise-Sensitive	45	45
Residential	50	45
Commercial	60	55
Industrial	75	75

Source: Stanislaus County Code, Section 10.46.050, Table A

2. Exterior noise levels shall not exceed the following cumulative duration allowance standards (Table 4):

Table 4
Cumulative Duration Allowance Standards

Cumulative Duration	Allowance Decibels
Equal to or greater than 30 minutes per hour	Table 3 + 0 dB
Equal to or greater than 15 minutes per hour	Table 3 + 5 dB
Equal to or greater than 5 minutes per hour	Table 3 + 10 dB
Equal to or greater than 1 minute per hour	Table 3 + 15 dB
Less than 1 minute per hour	Table 3 + 20 dB
Source: Stanislaus County Code, Section 10.46.050, Table B	

3. Pure Tone Noise, Speech and Music. The exterior noise level standards set forth in Table 3 shall be reduced by five dBA for pure tone noises, noises consisting primarily of speech or music, or reoccurring impulsive noise.

4. In the event the measured ambient noise level exceeds the applicable noise level standard above, the ambient noise level shall become the applicable exterior noise level standard.

10.46.060 Specific noise source standards.

B. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of 10:00 p.m. and 7:00 a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than 100 feet from the power tools or equipment.

E. Construction Equipment. No person shall operate any construction equipment so as to cause at or beyond the property line of any property upon which a dwelling unit is located an average sound level greater than 75 dB between the hours of 7:00 p.m. and 7:00 a.m.

10.46.070 Vibration.

Operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 100 feet from the source if on a public space or public right-of-way is prohibited. For the purpose of this section, “vibration perception threshold” means the minimum groundborne or structure-borne vibration motion necessary to cause a reasonable person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects, or a measured motion velocity of 0.01 in/sec over the range of 100 Hz.

Environmental Setting – Existing Ambient Noise and Vibration Environment

Noise-Sensitive Land Uses in the Project Vicinity

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

The noise-sensitive land uses which would potentially be affected by the project consist of residential uses to the north. Existing agricultural uses are located in all other directions, which are not considered to be noise-sensitive. The project area and surrounding land uses are shown on Figure 1.

Existing Traffic Noise Levels along Project Area Roadway Network

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to develop existing noise contours expressed in terms of DNL for major roadways within the project study area. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Traffic data in the form of AM and PM peak hour movements for existing conditions were obtained from the project applicant. Average daily traffic volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. Using these data and the FHWA Model, traffic noise levels were calculated. The traffic noise level at 100 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70 dB DNL contours are summarized in Table 5.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA Model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. It is also recognized that existing sensitive land uses within the project vicinity are located varying distances from the centerlines of the local roadway network. The 100-foot reference distance is utilized in this assessment to provide a reference position at which changes in existing and future traffic noise levels resulting from the project can be evaluated. Appendix B contains the FWHA Model inputs for existing conditions.

Table 5
Existing Traffic Noise Modeling Results

Seg.	Intersection	Direction	DNL 100 Feet from Roadway	Distance to Contour (feet)		
				70 dB DNL	65 dB DNL	60 dB DNL
1	Faith Home Rd / Keyes Rd	North	61	24	51	110
2		South	58	16	33	72
3		East	63	36	77	166
4		West	63	32	68	147
5	Foote Rd / Keyes Rd	North	44	2	4	9
6		South	53	8	17	36
7		East	64	39	84	181
8		West	64	38	82	177
9	SR 99 SB Ramp / Keyes Rd	North	62	27	59	126
10		South	66	53	115	247
11		East	64	38	82	177
12		West	64	39	84	181
13	SR 99 NB Ramp / Keyes Rd	North	63	35	75	161
14		South	64	40	86	185
15		East	65	45	97	208
16		West	64	38	82	177
17	Golden State Blvd / Nunes Rd	North	54	9	19	41
18		South	61	25	53	114
19		East	55	11	23	49
20		West	56	12	26	57
21	Golden State Blvd / Keyes Rd	North	61	25	53	114
22		South	60	21	45	96
23		East	63	34	74	159
24		West	65	45	97	208
25	S Washington Rd / Nunes Rd	North	55	10	22	48
26		South	--	--	--	--
27		East	55	11	23	49
28		West	55	10	23	49
29	Nunes Rd / Keyes Rd	North	55	11	23	49
30		South	--	--	--	--
31		East	63	35	74	160
32		West	63	34	74	159
33	Golden State Blvd / Barnhart Rd	North	59	18	38	81
34		South	61	25	54	116
35		East	47	3	6	13
36		West	--	--	--	--

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs provided by project applicant. Appendix B contains FHWA Model inputs.

Existing Overall Ambient Noise Environment within the Project Vicinity

The existing ambient noise environment within the project vicinity is defined primarily by noise from traffic on State Route 99 (SR 99), Nunes Road, Keyes Road, and Golden State Boulevard. To generally quantify the existing ambient noise environment within the project vicinity, BAC conducted long-term (48-hour) noise level measurements at three (3) locations from July 22-23, 2020. The noise survey locations are shown on Figure 1, identified as sites 1-3. Photographs of the noise level survey locations are provided in Appendix C.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used to complete the noise level measurement survey. The meters were calibrated immediately before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4).

The results of the long-term ambient noise survey are shown numerically and graphically in Appendices D and E (respectively) and are summarized below in Table 6.

Table 6
Summary of Long-Term Ambient Noise Measurement Results – July 22-23, 2020[1]

Site Description[2]	Date	DNL, dB	Average Measured Hourly Noise Levels, dB					
			Daytime[3]			Nighttime[4]		
			L_{50}	L_{eq}	L_{max}	L_{50}	L_{eq}	L_{max}
Site 1: Northeast of project in residence yard (5061 Nunes Road)	7/22/20	65	52	64	84	49	56	73
	7/23/20	64	52	59	79	49	58	77
Site 2: Northeast project boundary in residence yard (5000 Nunes Road)	7/22/20	67	60	66	81	55	57	72
	7/23/20	67	61	66	78	56	58	73
Site 3: Northwest of project in residence yard (4827 Nunes Road)	7/22/20	61	54	56	72	53	54	67
	7/23/20	61	55	56	71	53	55	66

[1] Detailed summaries of the noise monitoring results are provided in Appendices D and E.
[2] Long-term ambient noise monitoring locations are identified on Figure 1.
[3] Daytime: 7:00 a.m. to 10:00 p.m.
[4] Nighttime: 10:00 p.m. to 7:00 a.m.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Table 6, average measured hourly noise levels were consistent at each measurement site throughout the monitoring period. The Table 6 data also indicate that the measured day-night average noise level was highest at site 2. This was likely attributable to the combined influence of traffic noise from both Nunes Road and Washington Road at the measurement site.

Adjustments to General Plan & Municipal Code Noise Standards Based on Ambient Conditions

Policy 2 (Implementation Measure 2) of the Stanislaus County General Plan Noise Element states that where measured ambient noise levels exceed the non-transportation standards shown in Table 2, the standards shall be increased to the ambient levels. In addition, Section 10.46.050(A)(4) of the Stanislaus County Code also states that the ambient noise level shall become the applicable noise level standard in the event the measured ambient noise level exceeds the applicable noise level limit provided in Table 3.

Existing residential uses are located to the north, northwest, and east of the project site. However, as indicated on Figure 2, the parcel to the east of the project is planned for the development of commercial uses (not part of the proposed project). Because it is reasonably assumed that the existing residence to the east will be removed as a result of the proposed project, this assessment focuses on compliance with applicable General Plan and County Code noise criteria at the nearest existing residential uses to the north and northwest of the project.

BAC ambient noise measurement site 3 was selected to be representative of the ambient noise level environment at the nearest existing residential use to the northwest of the project. Noise level measurements collected at site 2 are considered to be representative of the ambient noise level environment at the nearest existing residential use directly north of the project (across Nunes Road). Although site 2 was not located at the nearest residential use to the north of the project, noise level measurements at site 2 are considered to be acoustically equivalent to the existing environment at the nearest residential use to the north based on similar distances to existing dominant noise sources (traffic).

Based on the measured ambient noise level data, and pursuant to the General Plan's adjustment criteria contained in Policy 2, the following noise standards shown in Table 7 have been applied to the project and assessed at the nearest existing residential uses to the project, located to the north and northwest.

Table 7
Adjusted General Plan Noise Level Standards Applicable to the Project

Nearest Residential Uses	Measured Noise Levels				Unadjusted Standards				Adjustment for Measured Ambient?				Applicable Standards[1]			
	Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
North	66	80	58	73	55	75	45	65	Y	Y	Y	Y	66	80	58	73
Northwest	56	72	55	67	55	75	45	65	Y	N	Y	Y	56	75	55	67

[1] Applicable noise levels are based upon measurements from the BAC ambient noise level survey. Measured averaged noise levels are used.

In order to quantify project operations noise levels relative to the County Code noise level criteria presented in Tables 3 and 4, the duration in which project noise sources occur during a given hour must be known. Because project on-site operations would occur throughout the duration of a given hour (i.e., 30 minutes or more), the noise level descriptor most applicable to the project would be the L_{50} descriptor. Based on the measured ambient noise level data, and pursuant to

the County Code's adjustment criteria presented in Tables 3 and 4, the following noise standards shown in Table 8 have been applied to the project and assessed at the nearest existing residential uses to the north and northwest of the project.

Table 8
Adjusted County Code Noise Level Standards Applicable to the Project

Nearest Residential Uses	Measured Noise Levels, L_{50}		Corresponding Unadjusted Standards, L_{50}		Adjustment for Measured Ambient?		Applicable Standards, L_{50}[1,2]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
North	61	56	50	45	Y	Y	61	56
Northwest	55	53	50	45	Y	Y	55	53

[1] Applicable noise levels are based upon measurements from the BAC ambient noise level survey. Measured averaged noise levels are used.
[2] L50 noise descriptor corresponds to a noise source occurring 30 minutes or more in a given hour.

Existing Ambient Vibration Environment

During a site visit on July 24, 2020, vibration levels were below the threshold of perception at the project site. Nonetheless, to quantify existing vibration levels at the project site, BAC conducted short-term (5-minute) vibration measurements at the locations identified on Figure 1 on July 24, 2020. Photographs of the vibration survey locations are provided in Appendix C.

A Larson-Davis Laboratories Model LxT precision integrating sound level meter equipped with a vibration transducer was used to complete the measurements. The results are summarized below in Table 9.

Table 9
Summary of Ambient Vibration Monitoring Results – July 24, 2020

Site	Time	Average Measured Vibration Level, PPV (in. sec)[1]
Site 1: North of project in residence yard (5061 Nunes Road)	10:55 a.m.	0.006
Site 2: Northeast project boundary in residence yard (5000 Nunes Road)	11:08 a.m.	0.009
Site 3: Northwest of project in residence yard (4827 Nunes Road)	11:19 a.m.	0.024

[1] PPV = Peak Particle Velocity (inches/second)
Source: Bollard Acoustical Consultants, Inc. (2020)

The Table 9 data indicate that measured average vibration levels within the project vicinity ranged from less than 0.006 to 0.024 in/sec PPV. The highest vibration level during the survey was measured at site 3, which was likely attributed to the proximity of the site to Nunes Road (approximately 25 feet from the roadway centerline).

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of this report, a noise and vibration impact is considered significant if the project would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies; or

- Generation of excessive groundborne vibration or groundborne noise levels; or

- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

The project site is not within the vicinity of a private airstrip, an airport land use plan, or within two miles of a public airport. Therefore, the last threshold listed above is not discussed further.

The following criteria based on standards established by the Stanislaus County General Plan and Stanislaus County Code were used to evaluate the significance of environmental noise and vibration resulting from the project:

- A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the Stanislaus County General Plan or Stanislaus County Code.

- A significant impact would be identified if off-site traffic noise exposure or on-site activities generated by the project would substantially increase noise levels at existing sensitive receptors in the vicinity. A substantial increase would be identified relative to the noise level increase significance criteria established in Policy 3 (Implementation Measure 1) of the Stanislaus County General Plan Noise Element.

- A significant impact would be identified if project construction activities or proposed on-site operations would expose noise-sensitive receptors to excessive groundborne vibration levels. Specifically, an impact would be identified if groundborne vibration levels due to these sources would exceed the applicable vibration criteria presented Section 10.46.070 of the Stanislaus County Code.

Noise Impacts Associated with Project-Generated Increases in Off-Site Traffic

With development of the project, traffic volumes on the local roadway network will increase. Those increases in daily traffic volumes will result in a corresponding increase in traffic noise levels at existing uses located along those roadways. The FHWA Model was used with traffic

input data provided by the project applicant to predict project traffic noise level increases relative to Existing and Cumulative conditions.

Impact 1: Increases in Existing Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Existing and Existing Plus Project conditions in the project area roadway network were obtained from the project applicant. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Existing versus Existing Plus Project traffic noise levels on the local roadway network are shown in Table 10. The following section includes an assessment of predicted traffic noise levels relative to the noise level increase significance criteria identified in Policy 3 of the Stanislaus County General Plan Noise Element. The Table 10 data are provided in terms of DNL (L_{dn}) at a standard distance of 100 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

Table 10
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, DNL (dB)			Substantial Increase?
			E	E+P	Increase	
1	Faith Home Rd / Keyes Rd	North	60.6	60.6	0.0	No
2		South	57.9	57.9	0.0	No
3		East	63.3	63.4	0.1	No
4		West	62.5	62.6	0.1	No
5	Foote Rd / Keyes Rd	North	44.2	44.2	0.0	No
6		South	53.4	53.4	0.0	No
7		East	63.9	64.0	0.1	No
8		West	63.7	63.8	0.1	No
9	SR 99 SB Ramp / Keyes Rd	North	61.5	63.5	2.0	No
10		South	65.9	66.7	0.8	No
11		East	63.7	64.7	1.0	No
12		West	63.9	64.0	0.1	No
13	SR 99 NB Ramp / Keyes Rd	North	63.1	64.6	1.5	No
14		South	64.0	65.2	1.2	No
15		East	64.8	66.2	1.4	No
16		West	63.7	64.7	1.0	No
17	Golden State Blvd / Nunes Rd	North	54.3	54.4	0.1	No
18		South	60.8	60.5	-0.3	No
19		East	55.4	55.6	0.2	No
20		West	56.3	57.3	1.0	No
21	Golden State Blvd / Keyes Rd	North	60.8	64.4	3.6	Yes
22		South	59.8	59.8	0.0	No
23		East	63.0	63.2	0.2	No
24		West	64.8	66.2	1.4	No
25	S Washington Rd / Nunes Rd	North	55.2	55.2	0.0	No
26		South	--	--	--	--
27		East	55.4	55.4	0.0	No

Table 10
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, DNL (dB)			Substantial Increase?
			E	E+P	Increase	
28		West	55.3	55.3	0.0	No
29	Nunes Rd / Keyes Rd	North	55.4	55.4	0.0	No
30		South	--	--	--	--
31		East	63.1	63.2	0.1	No
32		West	63.0	63.2	0.2	No
33	Golden State Blvd / Barnhart Rd	North	58.6	58.7	0.1	No
34		South	61.0	61.0	0.0	No
35		East	46.8	47.3	0.5	No
36		West	--	--	--	--

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from project applicant. Appendix B contains the FHWA Model inputs.

As indicated in Table 10, the project-generated increase in existing traffic noise levels is predicted to be substantial along one roadway segment evaluated in Table 10 (segment 21). However, analysis of segment 21 revealed that there are no residences or other sensitive land uses along that roadway segment. Because the project-related increase in traffic noise levels would not exceed the applicable Stanislaus County General Plan noise level increase criteria at existing sensitive receptors located along the project roadway network, this impact is identified as being ***less than significant***.

Impact 2: Increases in Cumulative Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Cumulative and Cumulative Plus Project conditions in the project area roadway network were obtained from the project applicant. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Cumulative versus Cumulative Plus Project traffic noise levels on the local roadway network are shown in Table 11. The following section includes an assessment of predicted traffic noise levels relative to the noise level increase significance criteria identified in Policy 3 of the Stanislaus County General Plan Noise Element. The Table 11 data are provided in terms of DNL (L_{dn}) at a standard distance of 100 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

Table 11
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

Segment	Intersection	Direction	Traffic Noise Level at 100 feet, DNL (dB)			Substantial Increase?
			C	C+P	Increase	
1	Faith Home Rd / Keyes Rd	North	63.1	63.1	0.0	No
2		South	60.3	60.4	0.1	No
3		East	65.7	65.8	0.1	No
4		West	64.9	65.0	0.1	No
5	Foote Rd / Keyes Rd	North	49.4	49.4	0.0	No
6		South	56.2	56.2	0.0	No
7		East	66.3	66.3	0.0	No
8		West	66.1	66.2	0.1	No
9	SR 99 SB Ramp / Keyes Rd	North	63.9	65.2	1.3	No
10		South	68.3	68.8	0.5	No
11		East	66.2	66.8	0.6	No
12		West	66.3	66.3	0.0	No
13	SR 99 NB Ramp / Keyes Rd	North	65.6	66.5	0.9	No
14		South	66.4	67.2	0.8	No
15		East	67.2	68.1	0.9	No
16		West	66.2	66.8	0.6	No
17	Golden State Blvd / Nunes Rd	North	56.7	56.8	0.1	No
18		South	63.3	63.3	0.0	No
19		East	57.8	57.8	0.0	No
20		West	58.8	58.8	0.0	No
21	Golden State Blvd / Keyes Rd	North	63.3	65.7	2.4	No
22		South	62.2	62.2	0.0	No
23		East	65.5	65.6	0.1	No
24		West	67.2	68.1	0.9	No
25	S Washington Rd / Nunes Rd	North	57.6	57.6	0.0	No
26		South	--	--	--	--
27		East	57.8	57.8	0.0	No
28		West	57.8	57.8	0.0	No
29	Nunes Rd / Keyes Rd	North	57.8	57.8	0.0	No
30		South	--	--	--	--
31		East	65.6	65.6	0.0	No
32		West	65.5	65.6	0.1	No
33	Golden State Blvd / Barnhart Rd	North	61.1	61.1	0.0	No
34		South	63.4	63.5	0.1	No
35		East	50.6	50.8	0.2	No
36		West	--	--	--	--

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from project applicant. Appendix B contains the FHWA Model inputs.

As indicated in Table 11, the project-generated increase in cumulative traffic noise levels is not predicted to be substantial along any of the roadway segments evaluated in Table 11. Because the project-related increase in traffic noise levels would not exceed the applicable Stanislaus

County General Plan noise level increase criteria at existing sensitive receptors located along the project roadway network, this impact is identified as being ***less than significant***.

Noise Impacts Associated with Proposed On-Site Operations

The project proposes the construction of on-site truck-related facilities that would include a wash and repair building, parking stalls, and diesel fueling station. The project also proposes the construction of a convenience store, gas station, and a fast food restaurant with drive-through services. The project proposes 24-hour operations of the on-site facilities.

Primary noise sources associated with daily on-site operations of the proposed facilities have been identified as truck movements, truck hitching, idling, and departures, truck refrigeration units, truck wash and repair building equipment, truck delivery activities (i.e., loading and unloading of product at businesses and fueling trucks), parking lot activities (i.e., vehicles arriving and departing, doors opening and closing, etc.), drive-through restaurant operations (i.e., vehicle passages and speaker noise), and rooftop mechanical equipment (HVAC). An assessment of each project-related noise source follows.

Impact 3: On-Site Truck Circulation Noise at Existing Sensitive Uses

The project site plans indicate that trucks will access the project site from two primary points – via Nunes Road on the northern end of the property, and from Golden State Boulevard on the southern end. The locations of the project site's primary truck access points are shown on Figure 2.

Because the Stanislaus County General Plan noise standards are provided in terms of both hourly average noise levels and individual maximum noise levels, it is necessary to identify the number of truck movements occurring during a typical busy hour of operations to assess compliance with the L_{eq}-based standards. According to the project site plans, the project proposes 41 truck parking stalls located along the northern project boundary. Assuming that all of the 41 proposed parking stalls could both fill and empty in one 24-hour period (believed to be a conservative assumption), the truck parking area would generate 82 heavy truck circulation operations on-site per day. After consideration of additional truck trips for the truck wash and fueling station, it was conservatively assumed that the project could generate 100 heavy truck circulation operations on-site per day. Based on these assumptions, the average number of hourly truck circulation operations (passbys) per hour was calculated to be approximately 4 (4.2) over a 24-hour period. For the purposes of this analysis, it was conservatively assumed that 4 truck circulation operations could occur during a typical busy hour. Noise exposure from these operations is calculated based on the following equation.

$$Hourly\ L_{eq} = SEL + 10*LOG(N) - 35.6 - A$$

The *SEL* is the sound exposure level produced by a truck event, *N* is the number of operations in a given hour, 35.6 is ten times the log of the number of seconds in an hour, and *A* is the attenuation due to distance (spherical spreading loss, -6 dB per doubling of distance).

Heavy truck arrivals and departures, and on-site truck circulation, will occur at low speeds. To quantify the noise generation of slow-moving trucks, BAC utilized single-event passby noise test results for slow-moving heavy trucks conducted at the West El Camino truck stop in Sacramento, California. The passby measurements were conducted at a reference distance of 50 feet at a location suitable for isolation of individual passby events. The results of the heavy truck measurements indicated that maximum noise levels ranged from 69 to 77 dB L_{max}, with a mean of 74 dB L_{max}. Truck passby levels measured in terms of Sound Exposure Levels (SEL) ranged from 77 to 85 dB, with a mean of 83 dB SEL.

Based on the assumptions and equation provided above, and assuming standard sound wave spreading loss (-6 dB per doubling of distance), project on-site truck circulation noise exposure at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) was calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 12 and 13, respectively.

Table 12
Predicted On-Site Truck Circulation Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)		Applicable General Plan Noise Standards (dB)			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential – North	100	49	68	66	80	58	73
Residential – Northwest	130	47	66	56	75	55	67

[1] Distances measured from nearest on-site circulation area to property line of nearest residential uses.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 13
Predicted On-Site Truck Circulation Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)[2]	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	100	44	61	56
Residential – Northwest	130	42	55	53

[1] Distances measured from nearest on-site truck circulation area to property line of nearest residential uses.
[2] Median (L50) noise levels would be approximately 5 dB less than hourly average (Leq) noise levels.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Tables 12 and 13, noise levels associated with project on-site truck circulation are predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). Further, the predicted noise levels

shown in Tables 12 and 13 are below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project on-site truck circulation noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because on-site truck circulation noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 4: Truck Hitching, Idling and Departure Noise at Existing Sensitive Uses

The project site plans indicate that the project proposes 41 truck parking stalls along the northern project boundary. Noise sources associated with truck parking operations on the project site will include truck hitching, idling, and departure. The proposed truck parking areas are shown on Figure 2.

To quantify noise levels associated with project truck hitching, idling, and departures, BAC utilized reference data for truck noise collected at a comparable facility. Similar to the operational assumptions utilized in **Impact 3**, it was conservatively assumed for the purposes of this analysis that 4 truck parking operations could occur during a given daytime or nighttime hour. As identified in the previous section, noise exposure from these operations is calculated based on the following equation:

$$Hourly\ L_{eq} = SEL + 10*LOG(N) - 35.6 - A$$

For this analysis, the *SEL* is the sound exposure level produced by a truck event is 83 dB SEL at 50 feet, the number of operations in a given hour is 3 (*N*), 35.6 is ten times the log of the number of seconds in an hour, and *A* is the attenuation due to distance (spherical spreading loss, -6 dB per doubling of distance). Based on the assumptions and equation provided above, project truck hitching, idling, and departure noise exposure at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) was calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 14 and 15, respectively.

Table 14
Predicted Truck Hitching, Idling & Departure Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)		Applicable General Plan Noise Standards (dB)			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential – North	115	47	67	66	80	58	73
Residential – Northwest	115	47	67	56	75	55	67

[1] Distances measured from center of nearest truck parking area to property line of nearest residential uses.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 15
Predicted Truck Hitching, Idling & Departure Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)[2]	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	115	43	61	56
Residential – Northwest	115	43	55	53

[1] Distances measured from center of nearest truck parking area to property line of nearest residential uses.
[2] Median (L50) noise levels would be approximately 5 dB less than hourly average (Leq) noise levels.
Source: Bollard Acoustical Consultants, Inc. (2020)

The data presented in Tables 14 and 15 indicate that project truck hitching, idling & departure noise levels are predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). In addition, the predicted noise levels shown in Tables 14 and 15 are at or below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project truck hitching, idling, and departure noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because truck parking operations noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 5: Truck Refrigeration Unit Noise at Existing Sensitive Uses

It is expected that a portion of trucks that will utilize the proposed parking stalls will be equipped with refrigeration units – which commonly operate constantly to maintain the temperature within the trailers. The truck refrigeration units are attached to the front of a trailer (facing forward), located above the truck cab.

To quantify noise levels associated with these units, BAC utilized short-term noise level measurement data of refrigeration units obtained for a trucking facility project in Fresno County, California (September 8, 2016). Specifically, the refrigeration equipment noise testing consisted of conducting two separate noise measurements which were representative of two refrigeration unit operation settings: cooling mode and maintenance mode. The noise measurement results are summarized in Table 16.

Table 16
Measured Truck Refrigeration Unit Reference Noise Levels Collected at a Trucking Facility in Fresno County, California (2016)

Description	Distance (ft)	Noise Level, L_{eq} (dB)
Refrigeration unit cooling	15	80
Refrigeration unit maintaining temperature	15	70
Source: Bollard Acoustical Consultants, Inc. (2016)		

As indicated in Table 16, the measured refrigeration unit noise levels varied depending on the operation setting. However, it is reasonably assumed for the purposes of this analysis that truck refrigeration units would not operate under the cooling mode while on the project site since the trailers arriving at the site would already be at the appropriate temperature. More specifically, it is reasonably assumed that the refrigeration units would only operate to maintain temperature while the trucks are on site.

To quantify project truck refrigeration unit noise level exposure, BAC utilized the reference noise level data provided above. Assuming standard spherical spreading loss (-6 dB per doubling of distance), project truck refrigeration unit noise levels at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) were calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 17 and 18, respectively. Because refrigeration equipment operation typically generates sustained, steady-state noise levels, impacts of truck refrigeration unit noise is assessed in this study relative to the applicable Stanislaus County General Plan hourly average (L_{eq}) and County Code median (L_{50}) noise level limits.

The results presented in Tables 17 and 18 take into consideration the orientation of the proposed truck parking stalls and resulting directionality of forward-facing (south-facing) truck refrigeration units in the stalls. Specifically, because a refrigeration unit in the truck parking stall would be 180 degrees off-axis relative to the nearest residential property lines to the north and northwest, and would be receive substantial shielding from the truck cab, an offset of -10 dB was applied at those property lines.

Table 17
Predicted Truck Refrigeration Unit Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{eq} (dB)[2,3]	Applicable General Plan Noise Standards, L_{eq} (dB)	
			Daytime	Nighttime
Residential – North	130	41	66	58
Residential – Northwest	130	41	56	55

[1] Distances measured from the nearest truck parking stall to the property lines of nearest residential uses.
[2] Predicted truck refrigeration unit noise levels use a reference noise level of 70 dB Leq at a distance of 15 feet.
[3] Predicted truck refrigeration unit noise levels include an offset of -10 dB to account for directionality and shielding.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 18
Predicted Truck Refrigeration Unit Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)[2,3]	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	130	41	61	56
Residential – Northwest	130	41	55	53

[1] Distances measured from nearest truck parking stall to the property lines of nearest residential uses.
[2] Predicted truck refrigeration unit noise levels use a reference noise level of 70 dB Leq at a distance of 15 feet.
[3] Predicted truck refrigeration unit noise levels include an offset of -10 dB to account for directionality and shielding.
Source: Bollard Acoustical Consultants, Inc. (2020)

In addition to the predicted truck refrigerator unit noise levels from the nearest parking stall to the closest residential property lines, the cumulative noise exposure from the simultaneous operation of multiple refrigerator units was estimated. Although it is difficult to determine with certainty the quantity of trucks that would have refrigeration units operating simultaneously at a given time, it was conservatively assumed for the purposes of this analysis that 25% of the 41 proposed truck stalls had trucks with refrigerator units operating simultaneously (calculated to be 10 units). To approximate the cumulative noise exposure from the operation of 10 refrigerator units in simultaneous operation, distances were scaled from the effective noise center of the nearest parking area to the property lines of the closest residential uses. The results of that analysis relative to the applicable Stanislaus County General Plan and County Code noise level limits are summarized in Tables 19 and 20, respectively.

Table 19
Predicted Cumulative Truck Refrigeration Unit Noise Levels at Nearest Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{eq} (dB)[2,3]	Applicable General Plan Noise Standards, L_{eq} (dB)	
			Daytime	Nighttime
Residential – North	130	51	66	58
Residential – Northwest	130	51	56	55

[1] Distances measured from center of nearest truck parking area to the property lines of nearest residential uses.
[2] Predicted cumulative truck refrigeration unit noise levels use a reference noise level of 80 dB Leq at a distance of 15 feet (10 units in simultaneous operation, based on a reference noise level of 1 unit of 70 dB at 15 feet).
[3] Predicted truck refrigeration unit noise levels include an offset of -10 dB to account for directionality and shielding.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 20
Predicted Cumulative Truck Refrigeration Unit Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)[2,3]	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	130	51	61	56
Residential – Northwest	130	51	55	53

[1] Distances measured from center of nearest truck parking area to the property lines of nearest residential uses.
[2] Predicted cumulative truck refrigeration unit noise levels use a reference noise level of 80 dB Leq at a distance of 15 feet (10 units in simultaneous operation, based on a reference noise level of 1 unit of 70 dB at 15 feet).
[3] Predicted truck refrigeration unit noise levels include an offset of -10 dB to account for directionality and shielding.

Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Tables 17-20, project truck refrigerator unit noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). Further, the predicted noise levels shown in Tables 17-20 are at or below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project truck refrigerator unit noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because truck refrigerator unit noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 6: Truck Wash and Repair Building Noise at Existing Sensitive Uses

A truck wash and repair building are proposed to be centrally located on the project property. The site plans indicate that the building will have a total of 4 truck bays. The site plans further illustrate that the trucks will enter the building via the northwest side and exit through the southeast end. The location of the proposed wash and repair building is shown on Figure 2.

In order to quantify noise levels associated with the proposed truck wash and repair building, BAC utilized file data collected for an automobile repair facility (Red Rocket Automotive Repair Facility in Sacramento, California – 2013). Specific noise sources quantified in the noise level data included an air compressor, air hammer, impact wrench, and an oil pump. The results of the reference noise level measurements are contained below in Table 21.

Table 21
Measured Automobile Repair Facility Reference Noise Levels Collected at the Red Rocket Automobile Repair Facility in Sacramento, California (2013)

Equipment	Measurement Distance (ft)	L_{eq} While in Use (dB)	Minutes Per Hour Used (est)[1]	Computed Hourly L_{eq} (dB)	Measured L_{max} (dB)
Compressor	30	73	15	67	75
Air hammer	30	92	5	81	95
Impact wrench	30	75	10	67	82
Oil pump	15	70	10	62	71

[1] The number of minutes in any given hour each noise source would be in operation was estimated from previous BAC observations at automobile repair facilities, as noise-producing equipment is not in constant use.

Source: Bollard Acoustical Consultants, Inc. (2013)

To quantify project truck wash and repair building equipment noise level exposure, BAC utilized the reference noise level data provided above. Specifically, the reference noise levels reported in Table 21 were projected from the proposed building to the property lines of the nearest residential property lines based on a sound level decay rate of -6 dB per doubling of distance from the source. The results of those projections relative to the applicable General Plan and County Code noise level standards are presented in Tables 22 and 23, respectively.

The project site plans indicate that the 4 truck bays within the building will be equipped with metal roll up doors on the entry and exit points (8 total). It is unclear at the time of writing this report whether the bay doors will be in the closed position during repair/wash equipment activities within the building. As a result, the results presented in Tables 22 and 23 do not include an offset for sound transmission loss provided by the building doors in the closed position.

Table 22
Predicted Truck Wash and Repair Building Equipment Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Residential Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)								Applicable General Plan Noise Standards (dB)			
		Compressor		Air Hammer		Impact Wrench		Oil Pump		Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
North	375	45	53	59	53	45	60	34	43	66	80	58	73
Northwest	360	45	53	59	53	45	60	34	43	56	75	55	67

[1] Distances measured from center of building to property line of nearest residential uses.

Source: Bollard Acoustical Consultants, Inc. (2020)

Table 23
Predicted Truck Wash and Repair Building Equipment Noise Levels
at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Residential Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)				Applicable County Code Noise Standards, L_{50} (dB)	
		Compressor	Air Hammer	Impact Wrench	Oil Pump	Daytime	Nighttime
North	375	40	54	40	29	61	56
Northwest	360	40	54	40	29	55	53

[1] Distances measured from center of building to property line of nearest residential uses.
Source: Bollard Acoustical Consultants, Inc. (2020)

The data presented in Tables 22 and 23 indicate that project truck wash and repair building equipment noise levels are predicted to exceed a portion of the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). In addition, building equipment noise levels could potentially exceed ambient daytime and nighttime noise levels at the nearest existing residential uses to the north and northwest. As a result, this impact is identified as being **potentially significant**.

Mitigation Impact 6:

In order to satisfy the applicable Stanislaus County General Plan and County Code noise level limits at the nearest existing residential uses, and subsequently result in truck wash and repair building equipment noise levels at or below ambient noise conditions at those uses, the following noise mitigation measure should be implemented:

MM 6: All truck wash and repair equipment operations should occur within the building with all metal roll-up bay doors in the closed position. The sound transmission loss provided by the building facade and all bay doors in the closed position is estimated to result in a noise level reduction of 15 dB at the nearest residential uses.

Tables 24 and 25 show the predicted mitigated equipment noise levels relative to the applicable General Plan and County Code noise level standards, respectively. As shown in Tables 24 and 25, mitigated equipment noise levels are predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the nearest existing residential uses. Further, predicted mitigated equipment noise levels would also be below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Table 24
Predicted Truck Wash and Repair Building Equipment Noise Levels vs. General Plan Noise Level Criteria – Mitigated

Nearest Residential Use	Predicted Mitigated Noise Levels (dB)[1]								Applicable General Plan Noise Standards (dB)			
	Compressor		Air Hammer		Impact Wrench		Oil Pump		Daytime		Nighttime	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
North	30	38	44	38	30	45	19	28	66	80	58	73
Northwest	30	38	44	38	30	45	19	28	56	75	55	67

[1] Predicted mitigated noise levels include an offset of -15 dB to account for the sound transmission loss provided by the building and bay doors in the closed position during equipment operations within building.

Source: Bollard Acoustical Consultants, Inc. (2020)

Table 25
Predicted Truck Wash and Repair Building Equipment Noise Levels vs. County Code Noise Level Criteria – Mitigated

Nearest Residential Use	Predicted Mitigated Noise Levels, L_{50} (dB)[1]				Applicable County Code Noise Standards, L_{50} (dB)	
	Compressor	Air Hammer	Impact Wrench	Oil Pump	Daytime	Nighttime
North	25	39	25	14	61	56
Northwest	25	39	25	14	55	53

[1] Predicted mitigated noise levels include an offset of -15 dB to account for the sound transmission loss provided by the building and bay doors in the closed position during equipment operations within the building.

Source: Bollard Acoustical Consultants, Inc. (2020)

Significance of Impact 6 after Mitigation: *Less than Significant*

Impact 7: Truck Delivery Operations Noise at Existing Sensitive Uses

The project site will receive deliveries of product to the convenience store and fast food restaurant, as well for deliveries from heavy fueling trucks associated with the proposed gas station. The primary noise sources associated with delivery area activities are trucks stopping (air brakes), trucks backing into position (back-up alarms), and pulling away from the delivery area (revving engines).

To quantify the noise generated by truck delivery operations, BAC utilized noise level data obtained from BAC field measurements of a commercial warehouse facility. According to BAC measurement data, truck loading dock average and maximum noise levels are approximately 63 dB L_{eq} and 75 dB L_{max} at a reference distance of 50 feet. Assuming standard spherical spreading loss (-6 dB per doubling of distance), project truck delivery area operations noise levels at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) were calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 26 and 27, respectively.

According to the project site plans, the delivery areas associated with the convenience store (north side of the building) and gas station storage tanks (east of the convenience store) are closest to the existing residential uses to the north and northwest of the project. Because it is possible that both delivery areas could receive deliveries simultaneously, the results presented in Tables 26 and 27 include the combined noise level exposure from both areas.

Table 26
Predicted Truck Delivery Operations Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)		Applicable General Plan Noise Standards (dB)			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential – North	440	47	56	66	80	58	73
Residential – Northwest	560	45	54	56	75	55	67

[1] Distances measured from effective noise center of the delivery areas associated with the convenience store to residential property lines.

Source: Bollard Acoustical Consultants, Inc. (2020)

Table 27
Predicted Truck Delivery Operations Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	440	42	61	56
Residential – Northwest	560	40	55	53

[1] Distances measured from effective noise center of the delivery areas associated with the convenience store to residential property lines.

Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Tables 26 and 27, project truck delivery noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). Further, the predicted noise levels shown in Tables 26 and 27 are below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project truck delivery noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because truck delivery noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 8: Parking Area Movement Noise at Existing Sensitive Uses

The project site plans indicate that the primary parking area for vehicles will be located at the south end of the project site, in between the convenience store and fast food restaurant. The location of the parking area is shown on Figure 2.

As a means of determining potential noise exposure due to project parking lot activities, Bollard Acoustical Consultants, Inc. (BAC) utilized specific parking lot noise level measurements conducted by BAC. Specifically, a series of individual noise measurements were conducted of multiple vehicle types arriving and departing a parking area, including engines starting and stopping, car doors opening and closing, and persons conversing as they entered and exited the vehicles. The results of those measurements revealed that individual parking lot movements generated mean noise levels of approximately 70 dB SEL at a reference distance of 50 feet. The maximum noise level associated with parking lot activity typically did not exceed 65 dB L_{max} at the same reference distance.

To compute hourly average (L_{eq}) noise levels generated by parking lot activities, the approximate number of hourly operations in any given area and distance to the effective noise center of those activities is required. According to the project site plans, the project proposes approximately 64 vehicle parking stalls. It was conservatively assumed for the purposes of this analysis that all of the parking stalls within an area could fill or empty during any given peak hour (worst-case). However, it is likely that parking area activity would be more spread out. The hourly average noise level generated by parking lot movements is computed using the following formula:

$$Peak\ Hour\ L_{eq} = 70+10*log\ (N) - 35.6$$

Where 70 is the mean Sound Exposure Level (SEL) for an automobile parking lot arrival or departure, N is the number of parking lot operations in a given hour, and 35.6 is 10 times the logarithm of the number of seconds in an hour.

Using the information provided above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), worst-case parking area noise levels at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) were calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 28 and 29, respectively.

Table 28
Predicted Worst-Case Parking Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)		Applicable General Plan Noise Standards (dB)			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential – North	600	31	43	66	80	58	73
Residential – Northwest	650	30	43	56	75	55	67

[1] Distances measured from effective noise center of the parking area to the residential property lines.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 29
Predicted Worst-Case Parking Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	600	26	61	56
Residential – Northwest	650	25	55	53

[1] Distances measured from effective noise center of the parking area to the residential property lines.
Source: Bollard Acoustical Consultants, Inc. (2020)

The data presented in Tables 28 and 29 indicate that project worst-case parking area noise levels are predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). In addition, the predicted noise levels shown in Tables 28 and 29 are below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project parking area noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because parking area noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 9: Restaurant Drive-Through Operations Noise at Existing Sensitive Uses

The project proposes the construction of restaurant that would include a drive-through lane. The primary noise sources associated with drive-through operations are vehicle passages and outdoor speakers. The location of the drive-through restaurant is shown on Figure 2.

To quantify the noise exposure of restaurant vehicle passages from the proposed drive-through lanes at the nearest existing residences, BAC utilized noise measurement data collected for

similar fast food drive-through operations. According to BAC file data, drive-through speaker and vehicle idling noise levels are approximately 50 dB L_{eq} and 55 dB L_{max} at a reference distance of 50 feet. Assuming standard spherical spreading loss (-6 dB per doubling of distance), project drive-through operations noise levels at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) were calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 30 and 31, respectively.

Table 30
Predicted Drive-Through Operations Noise Levels at Nearest Existing Sensitive Uses vs. General Plan Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels (dB)		Applicable General Plan Noise Standards (dB)			
				Daytime		Nighttime	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential – North	700	27	32	66	80	58	73
Residential – Northwest	800	26	31	56	75	55	67

[1] Distances measured from the center of the drive-through lane to the residential property lines.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 31
Predicted Drive-Through Operations Noise Levels at Nearest Existing Sensitive Uses vs. County Code Noise Level Criteria

Nearest Existing Sensitive Use	Distance to Property Line (ft)[1]	Predicted Noise Levels, L_{50} (dB)	Applicable County Code Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
Residential – North	700	22	61	56
Residential – Northwest	800	21	55	53

[1] Distances measured from the center of the drive-through lane to the residential property lines.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Tables 30 and 31, project restaurant drive-through noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). Further, the predicted noise levels shown in Tables 30 and 31 are below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project restaurant drive-through noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because drive-through noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 10: Rooftop Mechanical Equipment (HVAC) Noise at Existing Sensitive Uses

The heating, ventilating, and air conditioning (HVAC) requirements for the proposed buildings on the project site will likely consist of packaged rooftop air conditioning systems. Such rooftop-mounted HVAC equipment, which typically stand about 4-5 feet tall, would be shielded from view of nearby existing residences by the building parapets on top of the proposed buildings. Noise from rooftop-mounted mechanical equipment has been measured by BAC to be approximately 45 dB L_{eq} at a reference distance of 100 feet from the building facades of similar commercial uses, including shielding by the building parapet.

According to the project site plans, the project buildings proposed nearest to the existing residential uses to the north and northwest are the truck wash/repair shop and convenience store. Using the reference noise level data provided above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), project HVAC equipment noise levels at the property lines of the nearest existing sensitive uses (residences located north and northwest of the project) were calculated and the results of those calculations relative to the applicable General Plan and County Code noise level standards are presented in Tables 32 and 33, respectively.

Because HVAC equipment operation typically generates sustained, steady-state noise levels, impacts of HVAC equipment noise is assessed in this study relative to the applicable Stanislaus County General Plan hourly average (L_{eq}) and County Code median (L_{50}) noise level limits.

Table 32
Predicted HVAC Equipment Noise Levels at Nearest Sensitive Uses
vs. General Plan Noise Level Criteria

Nearest Residential Use	Distance to Property Line (ft)[1]		Predicted Noise Levels, L_{eq} (dB)		Applicable General Plan Noise Standards, L_{eq} (dB)	
	C-Store	Truck Shop	C-Store	Truck Shop	Daytime	Nighttime
North	450	300	32	35	66	58
Northwest	520	280	31	36	56	55

[1] Distances measured from building facades to the residential property lines.

Source: Bollard Acoustical Consultants, Inc. (2020)

Table 33
Predicted Cumulative Truck Refrigeration Unit Noise Levels at Nearest Existing Sensitive Uses
vs. County Code Noise Level Criteria

Nearest Residential Use	Distance to Property Line (ft)[1]		Predicted Noise Levels, L_{50} (dB)		Applicable County Code Noise Standards, L_{50} (dB)	
	C-Store	Truck Shop	C-Store	Truck Shop	Daytime	Nighttime
North	450	300	32	35	61	56
Northwest	520	280	31	36	55	53

[1] Distances measured from building facades to the residential property lines.

Source: Bollard Acoustical Consultants, Inc. (2020)

The data presented in Tables 32 and 33 indicate that project HVAC equipment noise levels are predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level standards at the property lines of the nearest existing sensitive uses (residential located north and northwest of the project site). In addition, the predicted noise levels shown in Tables 32 and 33 are below ambient daytime and nighttime noise levels measured at (or representative of) the nearest existing residential uses to the north and northwest (Table 6).

Because project HVAC equipment noise level exposure is predicted to satisfy the applicable Stanislaus County General Plan and County Code daytime and nighttime noise level limits, and because HVAC equipment noise levels are not predicted to significantly increase ambient noise levels at the nearest existing sensitive uses, this impact is identified as being ***less than significant.***

Impact 11: Cumulative (Combined) Noise Levels from On-Site Operations at Existing Sensitive Uses

The calculated unmitigated and mitigated cumulative noise levels of on-site operations at the nearest existing residential uses are presented in Tables 34-37. It should be noted that due to the logarithmic nature of the decibel scale, the sum of two noise values which differ by 10 dB equates to an overall increase in noise levels of 0.4 dB. When the noise sources are equivalent, the sum would result in an overall increase in noise levels of 3 dB.

Table 34
Predicted Cumulative Noise Levels from On-Site Operations vs. Applicable General Plan Standards – Unmitigated

Nearest Residential Use	Predicted On-Site Operations Noise Levels (dB)[1]															Applicable General Plan Stds.			
	Truck Circ.		Truck Hitching/Idling		Truck Cooling Equip.	Truck Wash		Delivery Trucks		Parking		Drive-Through		HVAC	Cumulative	Daytime		Nighttime	
	Leq	Lmax	Leq	Lmax	Leq	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Leq	Leq	Lmax	Leq	Lmax
North	47	68	49	68	51	59	62	47	56	31	43	27	32	37	61	72	66	80	58	73
Northwest	47	66	48	67	51	60	62	45	54	30	43	26	31	37	61	70	56	75	55	67
Source: Bollard Acoustical Consultants, Inc. (2020)																			

Table 35
Predicted Cumulative Noise Levels from On-Site Operations vs. Applicable County Code Standards – Unmitigated

Nearest Residential Use	Predicted On-Site Operations Noise Levels, L50 (dB)[1]									Applicable County Code Stds, L50 (dB)	
	Truck Circ.	Truck Hitching/Idling	Truck Cooling Equip.	Truck Wash	Delivery Trucks	Parking	Drive-Through	HVAC	Cumulative	Daytime	Nighttime
North	44	43	51	54	42	26	22	37	56	61	56
Northwest	42	43	51	55	40	25	21	37	57	55	53
Source: Bollard Acoustical Consultants, Inc. (2020)											

Table 36
Predicted Cumulative Noise Levels from On-Site Operations vs. Applicable General Plan Standards – Mitigated

Nearest Residential Use	Predicted On-Site Operations Noise Levels (dB)[1]															Applicable General Plan Stds.			
	Truck Circ.		Truck Hitching/Idling		Truck Cooling Equip.	Truck Wash		Delivery Trucks		Parking		Drive-Through		HVAC	Cumulative	Daytime		Nighttime	
	Leq	Lmax	Leq	Lmax	Leq	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Leq	Leq	Lmax	Leq	Lmax
North	47	68	49	68	51	44	47	47	56	31	43	27	32	37	56	71	66	80	58	73
Northwest	47	66	48	67	51	45	47	45	54	30	43	26	31	37	55	70	56	75	55	67

[1] Predicted truck wash noise levels include implementation of mitigation measure MM 6.
Source: Bollard Acoustical Consultants, Inc. (2020)

Table 37
Predicted Cumulative Noise Levels from On-Site Operations vs. Applicable County Code Standards – Mitigated

Nearest Residential Use	Predicted On-Site Operations Noise Levels, L50 (dB)[1]									Applicable County Code Stds, L50 (dB)	
	Truck Circ.	Truck Hitching/Idling	Truck Cooling Equip.	Truck Wash	Delivery Trucks	Parking	Drive-Through	HVAC	Cumulative	Daytime	Nighttime
North	44	43	51	39	42	26	22	37	53	61	56
Northwest	42	43	51	40	40	25	21	37	53	55	53

[1] Predicted truck wash noise levels include implementation of mitigation measure MM 6.
Source: Bollard Acoustical Consultants, Inc. (2020)

As indicated in Tables 34 and 35, cumulative unmitigated on-site project-related noise levels are predicted to exceed portions of the applicable Stanislaus County General Plan and County Code daytime and nighttime hourly average (L_{eq}) and maximum (L_{max}) noise level standards at the nearest existing residential uses to the north and northwest. However, after implementation of mitigation measure MM-6 (limitation to all truck wash and repair equipment operations occurring within the building with all metal roll-up doors in the closed position), cumulative mitigated on-site project noise levels are predicted to satisfy the applicable Stanislaus County Code daytime and nighttime noise level criteria at the property lines of the nearest existing residential uses (Table 37). The predicted mitigated cumulative noise levels shown in Table 37 are also at or below measured ambient daytime and nighttime noise levels measured at the nearest existing residential uses (Table 6).

Although the cumulative mitigated noise levels from on-site project operations are predicted to satisfy the applicable Stanislaus County General Plan daytime hourly average and maximum noise level limits at the nearest existing residential uses to the north and northwest, they are still predicted to exceed the applicable General Plan nighttime maximum noise level limit at the nearest existing residential use to the northwest (Table 36). In addition, it is possible that cumulative noise exposure could be above ambient nighttime maximum noise levels at that existing sensitive use. As a result, this impact is identified as being **potentially significant.**

Mitigation Impact 11:

In order to avoid a potential exceedance of applicable Stanislaus County General Plan nighttime maximum noise level limit at the nearest existing residential use to the northwest, and subsequently result in cumulative on-site project operations noise levels at or below ambient noise conditions at that use, the following noise mitigation measure should be implemented by the project:

MM 11: The construction of a solid noise barrier measuring 7-feet in height along the northern project property boundary, as indicated on Figure 2. The solid noise barrier could take the form of masonry wall, earthen berm, or a combination of the two. Other materials may be acceptable but should be reviewed by an acoustical consultant prior to use.

Table 38 shows the calculated cumulative on-site project operations maximum noise levels at the nearest existing residential use to the northwest after implementation of a 7-foot tall solid noise barrier, as discussed above.

Table 38
Predicted Cumulative On-Site Operations Maximum Noise Level
at the Nearest Existing Residential Use to the Northwest – Mitigated

Nearest Residential Use	Predicted Cumulative Operations Noise Level, L_{max} (dB)[1]	Applicable General Plan Noise Standard, L_{max} (dB)
		Nighttime
Northwest	64	67

[1] Predicted noise level take into consideration the screening provided by a 7-foot tall noise barrier at the location illustrated on Figure 2.

Source: Bollard Acoustical Consultants, Inc. (2020)

The construction of a 7-foot solid noise barrier at the location indicated on Figure 2 is predicted to result in the satisfaction of the applicable General Plan nighttime maximum noise level limit at the nearest existing residential use to the northwest. It should be noted that the construction of the recommended noise barrier would further reduce noise levels from other on-site sources at the nearest existing residential use to the northwest.

Significance of Impact 11 after Mitigation: ***Less than Significant***

Noise Impacts Associated with Project Construction Activities

Impact 12: Project Construction Noise Levels at Existing Sensitive Uses

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending upon the proximity of equipment activities to that point. The property lines of the nearest existing residential use is located approximately 25 feet away from where construction activities would occur on the project site.

Table 39 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of these construction activities would be required of this project. The Table 39 data also include predicted maximum equipment noise levels at the property lines of the nearest residential use located approximately 25 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Table 39
Construction Equipment Reference Noise Levels and Predicted Noise Levels 25 Feet

Equipment Description	Maximum Noise Level at 50 Feet, dBA	Predicted Maximum Noise Level at 25 feet, dBA
Air compressor	80	86
Backhoe	80	86
Ballast equalizer	82	88
Ballast tamper	83	89
Compactor	82	88
Concrete mixer	85	91
Concrete pump	82	88
Concrete vibrator	76	82
Crane, mobile	83	89
Dozer	85	91
Generator	82	88
Grader	85	91
Impact wrench	85	91
Loader	80	86
Paver	85	91
Pneumatic tool	85	91
Pump	77	83
Saw	76	82
Scarifier	83	89
Scraper	85	91
Shovel	82	88
Spike driver	77	83
Tie cutter	84	90
Tie handler	80	86
Tie inserter	85	91
Truck	84	90

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

Based on the equipment noise levels in Table 39, worst-case on-site project construction equipment noise levels at the property line of the nearest existing residential use located 25 feet away are expected to range from approximately 82 to 91 dB. Thus, it is possible that a portion of the project construction equipment could result in substantial short-term increases over ambient maximum noise levels at the nearest existing sensitive uses. Further, it is possible that those noise levels could exceed the applicable Stanislaus County General Plan and County Code noise level limits at that location. As a result, noise impacts associated with construction activities are identified as being **potentially significant**.

Mitigation for Impact 12: Construction Noise Control Measures

MM 12: To the maximum extent practical, the following measures should be incorporated into the project construction operations:

- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive uses.
- Project area and site access road speed limits shall be established and enforced during the construction period.
- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Significance of Impact 12 after Mitigation: ***Less than Significant***

Vibration Impacts Associated with Project Activities

Impact 13: Vibration Generated by Project Construction

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest existing residential use (north of the project) is located approximately 115 feet from construction activities which would occur within the project site.

Table 40 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 40 data also include predicted equipment vibration levels at the nearest existing residence to the north of the project site located approximately 115 feet away.

Table 40
Vibration Source Levels for Construction Equipment and Predicted Levels at 115 Feet

Equipment	Maximum PPV (inches/second)[1]	
	Maximum PPV at 25 Feet[2]	Predicted PPV at 115 Feet
Hoe ram	0.089	0.009
Large bulldozer	0.089	0.009
Caisson drilling	0.089	0.009
Loaded trucks	0.076	0.008
Jackhammer	0.035	0.004
Small bulldozer	0.003	<0.001

[1] PPV = Peak Particle Velocity
[2] Reference vibration level obtained from the Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (2018).

Section 10.46.070 of the Stanislaus County Municipal Code states the operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property is prohibited. The code section further defines "vibration perception threshold" as the minimum groundborne or structure-borne vibration motion necessary to cause a reasonable person to be aware of the vibration by such direct means as sensation by touch or visual observation of moving objects, or a measured motion velocity of 0.01 in/sec over the range of 100 Hz.

As indicated in Table 40, vibration levels generated from on-site construction activities at the nearest existing residence located approximately 115 feet away are predicted to be below the Stanislaus County Municipal Code vibration perception threshold of 0.01 in/sec PPV. Therefore, on-site construction within the project area is not expected to result in excessive groundborne vibration levels at nearby existing residential uses.

Results from the ambient vibration level monitoring indicate that measured average vibration levels at the project site (site 2) were below the Stanislaus County Municipal Code vibration perception threshold of 0.01 in/sec (Table 9). Therefore, it is expected that the project would not result in the exposure of persons to excessive groundborne vibration levels at proposed uses of the project.

Because project construction vibration levels due to and upon the proposed project are expected to satisfy the applicable Stanislaus County Municipal Code vibration criteria, this impact is considered to be ***less than significant***.

Impact 14: Vibration Generated by Project On-Site Operations

The project proposes on-site operations such as heavy truck circulation and parking movements, truck wash and repair activities, loading and unloading activities, vehicle parking lot movements, drive-through restaurant operations, and mechanical equipment. It is the experience of BAC that operations associated with limited loading area operations do not typically have equipment that generates appreciable vibration. In addition, vibration levels from heavy trucks traveling on a roadway, such as those generated from project heavy truck traffic, rarely generate vibration amplitudes high enough to cause structural or cosmetic damage. Finally, it is our understanding that the project does not propose on-site equipment that will produce appreciable vibration.

Results from the ambient vibration level monitoring indicate that measured average vibration levels at the project site (site 2) were below the Stanislaus County Municipal Code vibration perception threshold of 0.01 in/sec (Table 9). Therefore, it is expected that the project would not result in the exposure of persons to excessive groundborne vibration levels at proposed uses of the project.

Because project on-site operations vibration levels due to and upon the proposed project are expected to satisfy the applicable Stanislaus County Municipal Code vibration criteria, this impact is considered to be ***less than significant***.

This concludes BAC's noise and vibration assessment of the Nunes Travel Plaza project in Stanislaus County, California. Please contact BAC at (916) 663-0500 or dariog@bacnoise.com if you have any comments or questions regarding this report.

Appendix A
Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
Nunes Travel Plaza
File Name: 2020-120 01 Existing
Model Run Date: 8/10/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Faith Home Rd / Keyes Rd	North	3,570	80	20	2	2	50	100
2		South	1,895	80	20	2	2	50	100
3		East	8,430	80	20	2	2	45	100
4		West	7,005	80	20	2	2	45	100
5	Foote Rd / Keyes Rd	North	135	80	20	2	2	40	100
6		South	865	80	20	2	2	45	100
7		East	9,600	80	20	2	2	45	100
8		West	9,240	80	20	2	2	45	100
9	SR 99 SB Ramp / Keyes Rd	North	1,930	80	20	2	2	70	100
10		South	5,275	80	20	2	2	70	100
11		East	9,275	80	20	2	2	45	100
12		West	9,600	80	20	2	2	45	100
13	SR 99 NB Ramp / Keyes Rd	North	2,790	80	20	2	2	70	100
14		South	3,425	80	20	2	2	70	100
15		East	11,810	80	20	2	2	45	100
16		West	9,275	80	20	2	2	45	100
17	Golden State Blvd / Nunes Rd	North	2,860	80	20	2	2	25	100
18		South	4,780	80	20	2	2	45	100
19		East	1,775	80	20	2	2	40	100
20		West	1,925	80	20	2	3	40	100
21	Golden State Blvd / Keyes Rd	North	4,780	80	20	2	2	45	100
22		South	6,400	80	20	2	2	35	100
23		East	7,930	80	20	2	2	45	100
24		West	11,810	80	20	2	2	45	100
25	S Washington Rd / Nunes Rd	North	2,235	80	20	2	2	35	100
26		South							
27		East	1,765	80	20	2	2	40	100
28		West	1,730	80	20	2	2	40	100
29	Nunes Rd / Keyes Rd	North	1,755	80	20	2	2	40	100
30		South							
31		East	8,005	80	20	2	2	45	100
32		West	7,930	80	20	2	2	45	100
33	Golden State Blvd / Barnhart Rd	North	4,965	80	20	2	2	35	100
34		South	4,925	80	20	2	2	45	100
35		East	190	80	20	2	2	45	100
36		West							

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
Nunes Travel Plaza
File Name: 2020-120 02 Existing+Project
Model Run Date: 8/10/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Faith Home Rd / Keyes Rd	North	3,580	80	20	2	2	50	100
2		South	1,925	80	20	2	2	50	100
3		East	8,620	80	20	2	2	45	100
4		West	7,155	80	20	2	2	45	100
5	Foote Rd / Keyes Rd	North	135	80	20	2	2	40	100
6		South	865	80	20	2	2	45	100
7		East	9,790	80	20	2	2	45	100
8		West	9,430	80	20	2	2	45	100
9	SR 99 SB Ramp / Keyes Rd	North	3,050	80	20	2	2	70	100
10		South	6,350	80	20	2	2	70	100
11		East	11,660	80	20	2	2	45	100
12		West	9,790	80	20	2	2	45	100
13	SR 99 NB Ramp / Keyes Rd	North	3,895	80	20	2	2	70	100
14		South	4,515	80	20	2	2	70	100
15		East	16,390	80	20	2	2	45	100
16		West	11,660	80	20	2	2	45	100
17	Golden State Blvd / Nunes Rd	North	2,975	80	20	2	2	25	100
18		South	4,395	80	20	2	2	45	100
19		East	1,850	80	20	2	2	40	100
20		West	2,390	80	20	2	3	40	100
21	Golden State Blvd / Keyes Rd	North	10,950	80	20	2	2	45	100
22		South	6,460	80	20	2	2	35	100
23		East	8,170	80	20	2	2	45	100
24		West	16,390	80	20	2	2	45	100
25	S Washington Rd / Nunes Rd	North	2,245	80	20	2	2	35	100
26		South							
27		East	1,765	80	20	2	2	40	100
28		West	1,740	80	20	2	2	40	100
29	Nunes Rd / Keyes Rd	North	1,755	80	20	2	2	40	100
30		South							
31		East	8,245	80	20	2	2	45	100
32		West	8,170	80	20	2	2	45	100
33	Golden State Blvd / Barnhart Rd	North	5,035	80	20	2	2	35	100
34		South	4,970	80	20	2	2	45	100
35		East	210	80	20	2	2	45	100
36		West							

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
Nunes Travel Plaza
File Name: 2020-120 03 Cumulative
Model Run Date: 8/10/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Faith Home Rd / Keyes Rd	North	6,250	80	20	2	2	50	100
2		South	3,350	80	20	2	2	50	100
3		East	14,750	80	20	2	2	45	100
4		West	12,250	80	20	2	2	45	100
5	Foote Rd / Keyes Rd	North	450	80	20	2	2	40	100
6		South	1,650	80	20	2	2	45	100
7		East	16,800	80	20	2	2	45	100
8		West	16,100	80	20	2	2	45	100
9	SR 99 SB Ramp / Keyes Rd	North	3,350	80	20	2	2	70	100
10		South	9,200	80	20	2	2	70	100
11		East	16,250	80	20	2	2	45	100
12		West	16,800	80	20	2	2	45	100
13	SR 99 NB Ramp / Keyes Rd	North	4,900	80	20	2	2	70	100
14		South	6,000	80	20	2	2	70	100
15		East	20,650	80	20	2	2	45	100
16		West	16,250	80	20	2	2	45	100
17	Golden State Blvd / Nunes Rd	North	5,050	80	20	2	2	25	100
18		South	8,350	80	20	2	2	45	100
19		East	3,100	80	20	2	2	40	100
20		West	3,400	80	20	2	3	40	100
21	Golden State Blvd / Keyes Rd	North	8,350	80	20	2	2	45	100
22		South	11,150	80	20	2	2	35	100
23		East	13,950	80	20	2	2	45	100
24		West	20,650	80	20	2	2	45	100
25	S Washington Rd / Nunes Rd	North	3,900	80	20	2	2	35	100
26		South							
27		East	3,100	80	20	2	2	40	100
28		West	3,100	80	20	2	2	40	100
29	Nunes Rd / Keyes Rd	North	3,100	80	20	2	2	40	100
30		South							
31		East	14,150	80	20	2	2	45	100
32		West	13,950	80	20	2	2	45	100
33	Golden State Blvd / Barnhart Rd	North	8,750	80	20	2	2	35	100
34		South	8,700	80	20	2	2	45	100
35		East	450	80	20	2	2	45	100
36		West							

Note: Blank cells represent roadways for which no traffic data was provided.

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
Nunes Travel Plaza
File Name: 2020-120 04 Cumulative+Project
Model Run Date: 8/10/2020

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	Faith Home Rd / Keyes Rd	North	6,260	80	20	2	2	50	100
2		South	3,380	80	20	2	2	50	100
3		East	14,940	80	20	2	2	45	100
4		West	12,400	80	20	2	2	45	100
5	Foote Rd / Keyes Rd	North	450	80	20	2	2	40	100
6		South	1,650	80	20	2	2	45	100
7		East	16,990	80	20	2	2	45	100
8		West	16,290	80	20	2	2	45	100
9	SR 99 SB Ramp / Keyes Rd	North	4,470	80	20	2	2	70	100
10		South	10,275	80	20	2	2	70	100
11		East	18,635	80	20	2	2	45	100
12		West	16,990	80	20	2	2	45	100
13	SR 99 NB Ramp / Keyes Rd	North	6,005	80	20	2	2	70	100
14		South	7,090	80	20	2	2	70	100
15		East	25,230	80	20	2	2	45	100
16		West	18,635	80	20	2	2	45	100
17	Golden State Blvd / Nunes Rd	North	5,080	80	20	2	2	25	100
18		South	8,400	80	20	2	2	45	100
19		East	3,110	80	20	2	2	40	100
20		West	3,410	80	20	2	3	40	100
21	Golden State Blvd / Keyes Rd	North	14,520	80	20	2	2	45	100
22		South	11,210	80	20	2	2	35	100
23		East	14,190	80	20	2	2	45	100
24		West	25,230	80	20	2	2	45	100
25	S Washington Rd / Nunes Rd	North	3,910	80	20	2	2	35	100
26		South							
27		East	3,100	80	20	2	2	40	100
28		West	3,110	80	20	2	2	40	100
29	Nunes Rd / Keyes Rd	North	3,100	80	20	2	2	40	100
30		South							
31		East	14,390	80	20	2	2	45	100
32		West	14,190	80	20	2	2	45	100
33	Golden State Blvd / Barnhart Rd	North	8,820	80	20	2	2	35	100
34		South	8,750	80	20	2	2	45	100
35		East	470	80	20	2	2	45	100
36		West							

Note: Blank cells represent roadways for which no traffic data was provided.









Legend

- A Site 1: 37°33'5.04"N, 120°54'2.01"W
- B Site 2: 37°33'3.65"N, 120°54'6.92"W
- C Site 2: 37°33'3.65"N, 120°54'6.92"W
- D Site 3: 37°33'5.32"N, 120°54'16.37"W

Nunes Road Travel Plaza
Stanislaus County, California

Photographs of Long-Term
Noise Survey Equipment

Appendix C-1

BOLLARD Acoustical









Legend

- A Site 1: 37°33'4.92"N, 120°54'1.94"W
- B Site 2: 37°33'4.06"N, 120°54'6.84"W
- C Site 2: 37°33'4.06"N, 120°54'6.84"W
- D Site 3: 37°33'4.77"N, 120°54'15.93"W

Nunes Road Travel Plaza
Stanislaus County, California

Photographs of Short-Term Vibration Survey Equipment

Appendix C-2

BOLLARD Acoustical

Appendix D-1
Ambient Noise Monitoring Results - Site 1
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	51	72	47	44
1:00 AM	50	71	46	42
2:00 AM	49	68	46	42
3:00 AM	54	76	49	46
4:00 AM	59	75	52	48
5:00 AM	59	72	56	50
6:00 AM	56	71	52	47
7:00 AM	58	80	50	47
8:00 AM	56	74	50	47
9:00 AM	57	82	50	47
10:00 AM	56	74	49	45
11:00 AM	57	78	48	45
12:00 PM	60	84	50	46
1:00 PM	57	76	51	47
2:00 PM	70	103	52	49
3:00 PM	71	103	53	51
4:00 PM	68	88	56	51
5:00 PM	64	87	53	49
6:00 PM	64	94	52	45
7:00 PM	60	85	55	45
8:00 PM	59	83	53	49
9:00 PM	59	76	52	46
10:00 PM	59	86	47	43
11:00 PM	50	68	45	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	71	56	64	59	49	56
Lmax (Maximum)	103	74	84	86	68	73
L50 (Median)	56	48	52	56	45	49
L90 (Background)	51	45	47	50	41	45

Computed DNL, dB	65
% Daytime Energy	92%
% Nighttime Energy	8%

GPS Coordinates	37°33'5.04"N
	120°54'2.01"W

BOLLARD
Acoustical Consultants

Appendix D-2
Ambient Noise Monitoring Results - Site 1
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	50	70	44	41
1:00 AM	51	74	46	43
2:00 AM	52	74	48	45
3:00 AM	53	75	48	45
4:00 AM	59	75	51	47
5:00 AM	59	75	54	50
6:00 AM	59	83	54	49
7:00 AM	57	74	50	47
8:00 AM	56	79	51	48
9:00 AM	58	83	48	44
10:00 AM	57	80	49	45
11:00 AM	56	74	49	46
12:00 PM	60	87	51	48
1:00 PM	58	75	52	49
2:00 PM	57	73	52	48
3:00 PM	59	85	53	49
4:00 PM	59	77	53	50
5:00 PM	59	76	53	51
6:00 PM	62	91	54	51
7:00 PM	59	76	56	52
8:00 PM	58	76	52	49
9:00 PM	59	77	51	47
10:00 PM	64	95	48	45
11:00 PM	53	73	46	43

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	62	56	59	64	50	58
Lmax (Maximum)	91	73	79	95	70	77
L50 (Median)	56	48	52	54	44	49
L90 (Background)	52	44	48	50	41	45

Computed DNL, dB	64
% Daytime Energy	67%
% Nighttime Energy	33%

GPS Coordinates	37°33'5.04"N
	120°54'2.01"W

BOLLARD
Acoustical Consultants

Appendix D-3
Ambient Noise Monitoring Results - Site 2
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	56	71	54	51
1:00 AM	54	77	52	50
2:00 AM	54	66	53	50
3:00 AM	57	70	56	53
4:00 AM	58	70	58	55
5:00 AM	60	69	59	57
6:00 AM	57	69	56	54
7:00 AM	58	75	55	53
8:00 AM	57	70	56	54
9:00 AM	58	75	56	53
10:00 AM	56	69	55	51
11:00 AM	58	84	54	50
12:00 PM	60	85	54	51
1:00 PM	59	82	54	51
2:00 PM	60	85	56	53
3:00 PM	62	90	57	54
4:00 PM	60	79	57	55
5:00 PM	66	87	58	55
6:00 PM	71	90	71	70
7:00 PM	71	82	71	70
8:00 PM	71	83	71	70
9:00 PM	70	75	70	56
10:00 PM	61	87	55	52
11:00 PM	53	68	52	48

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	71	56	66	61	53	57
Lmax (Maximum)	90	69	81	87	66	72
L50 (Median)	71	54	60	59	52	55
L90 (Background)	70	50	56	57	48	52

Computed DNL, dB	67
% Daytime Energy	93%
% Nighttime Energy	7%

GPS Coordinates	37°33'3.65"N
	120°54'6.92"W

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Appendix D-4
Ambient Noise Monitoring Results - Site 2
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	54	69	52	50
1:00 AM	55	76	53	50
2:00 AM	55	66	54	51
3:00 AM	56	71	56	53
4:00 AM	58	78	57	55
5:00 AM	60	73	60	58
6:00 AM	60	74	59	57
7:00 AM	58	73	57	55
8:00 AM	58	78	57	55
9:00 AM	58	82	54	51
10:00 AM	58	81	54	50
11:00 AM	56	73	54	52
12:00 PM	60	84	56	54
1:00 PM	59	75	57	54
2:00 PM	58	71	57	54
3:00 PM	58	75	57	55
4:00 PM	59	72	58	56
5:00 PM	71	77	71	70
6:00 PM	71	82	71	70
7:00 PM	71	80	71	70
8:00 PM	71	80	71	70
9:00 PM	69	81	70	55
10:00 PM	61	86	56	54
11:00 PM	55	68	54	52

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	71	56	66	61	54	58
Lmax (Maximum)	84	71	78	86	66	73
L50 (Median)	71	54	61	60	52	56
L90 (Background)	70	50	58	58	50	53

Computed DNL, dB	67
% Daytime Energy	92%
% Nighttime Energy	8%

GPS Coordinates	37°33'3.65"N
	120°54'6.92"W

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Appendix D-5
Ambient Noise Monitoring Results - Site 3
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	53	65	52	49
1:00 AM	52	67	51	48
2:00 AM	52	60	52	49
3:00 AM	55	72	55	52
4:00 AM	56	67	55	53
5:00 AM	57	64	56	54
6:00 AM	55	68	54	52
7:00 AM	54	67	53	52
8:00 AM	55	71	54	52
9:00 AM	56	75	54	52
10:00 AM	54	73	52	50
11:00 AM	56	74	52	49
12:00 PM	55	75	52	49
1:00 PM	54	68	53	50
2:00 PM	55	72	54	51
3:00 PM	61	90	55	52
4:00 PM	56	73	55	53
5:00 PM	56	67	55	53
6:00 PM	56	67	55	50
7:00 PM	56	73	55	49
8:00 PM	56	67	56	54
9:00 PM	57	73	56	52
10:00 PM	54	75	52	50
11:00 PM	51	61	50	47

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61	54	56	57	51	54
Lmax (Maximum)	90	67	72	75	60	67
L50 (Median)	56	52	54	56	50	53
L90 (Background)	54	49	51	54	47	51

Computed DNL, dB	61
% Daytime Energy	72%
% Nighttime Energy	28%

GPS Coordinates	37°33'5.32"N
	120°54'16.37"W

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Appendix D-6
Ambient Noise Monitoring Results - Site 3
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020

Hour	Leq	Lmax	L50	L90
12:00 AM	51	63	51	49
1:00 AM	52	63	51	49
2:00 AM	53	66	52	50
3:00 AM	54	66	53	51
4:00 AM	55	71	55	53
5:00 AM	58	68	57	55
6:00 AM	58	71	57	55
7:00 AM	55	67	54	53
8:00 AM	56	71	55	53
9:00 AM	53	66	51	49
10:00 AM	53	69	52	49
11:00 AM	54	70	53	50
12:00 PM	55	68	54	52
1:00 PM	56	72	55	53
2:00 PM	55	69	54	53
3:00 PM	55	70	55	53
4:00 PM	56	69	56	53
5:00 PM	58	72	57	55
6:00 PM	59	74	58	56
7:00 PM	60	83	58	56
8:00 PM	57	70	56	54
9:00 PM	56	71	55	53
10:00 PM	54	64	54	52
11:00 PM	52	63	51	50

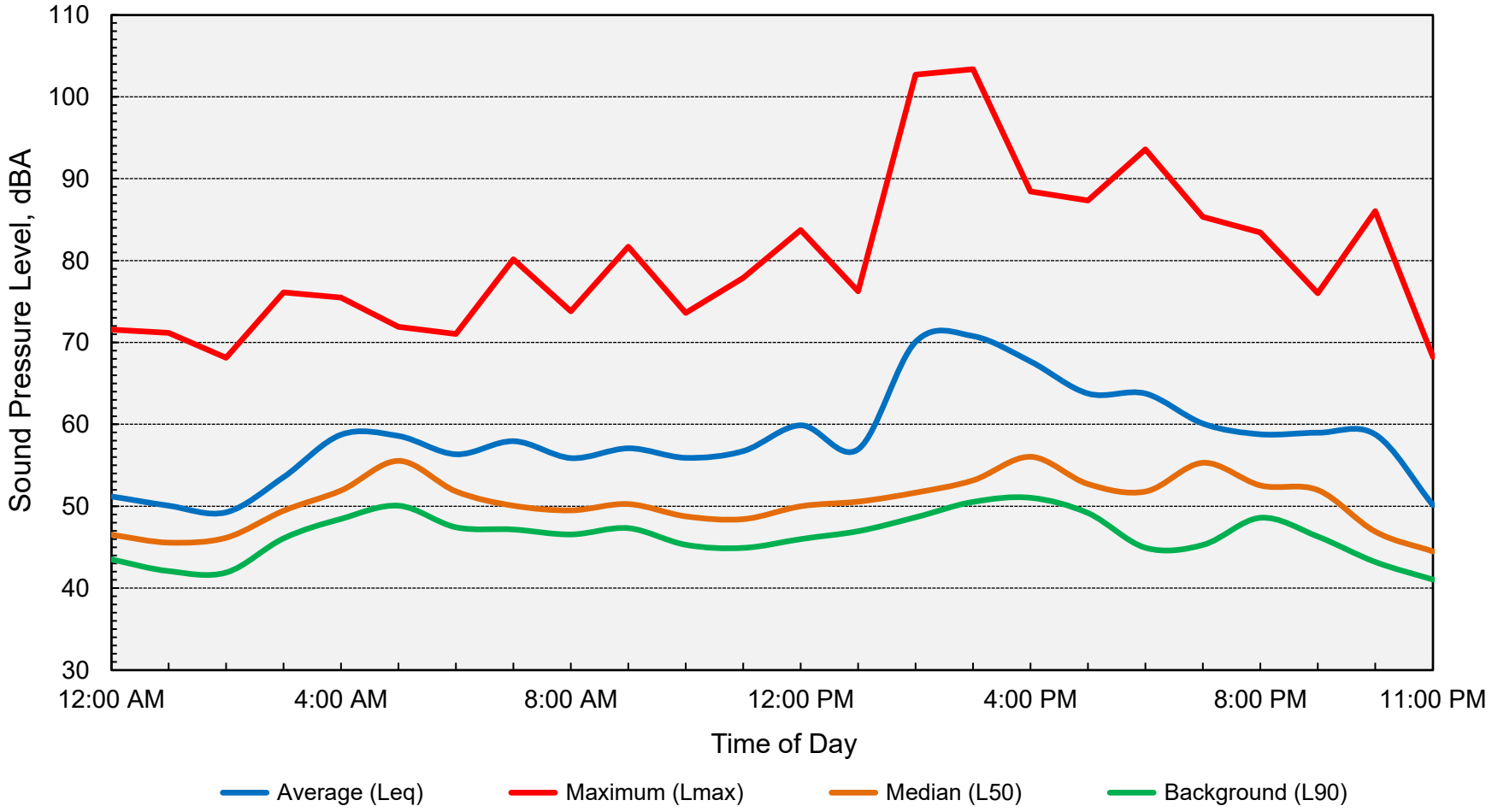
	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	60	53	56	58	51	55
Lmax (Maximum)	83	66	71	71	63	66
L50 (Median)	58	51	55	57	51	53
L90 (Background)	56	49	53	55	49	51

Computed DNL, dB	61
% Daytime Energy	70%
% Nighttime Energy	30%

GPS Coordinates	37°33'5.32"N
	120°54'16.37"W

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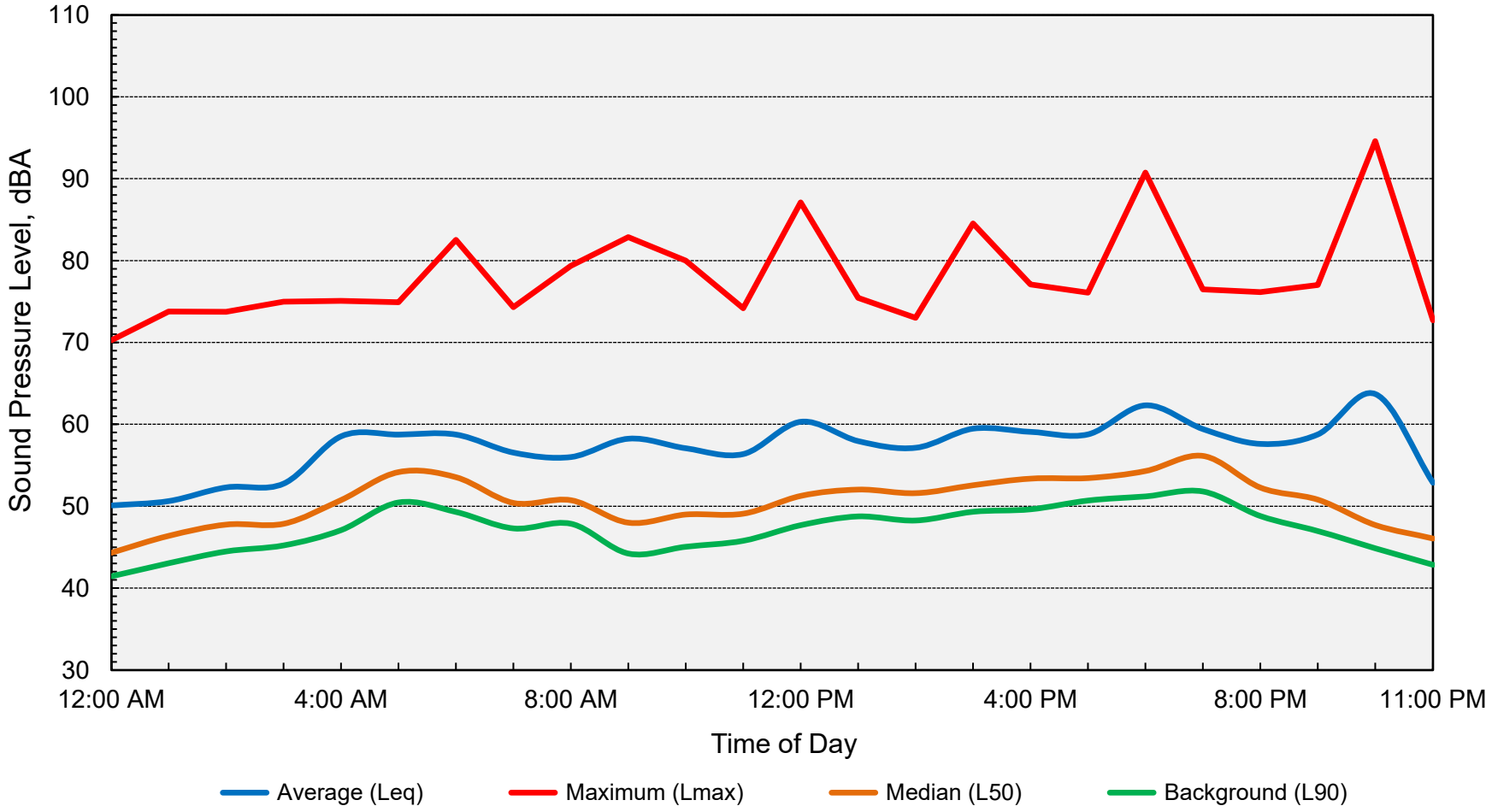
Appendix E-1
Ambient Noise Monitoring Results - Site 1
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020



Computed DNL = 65 dB

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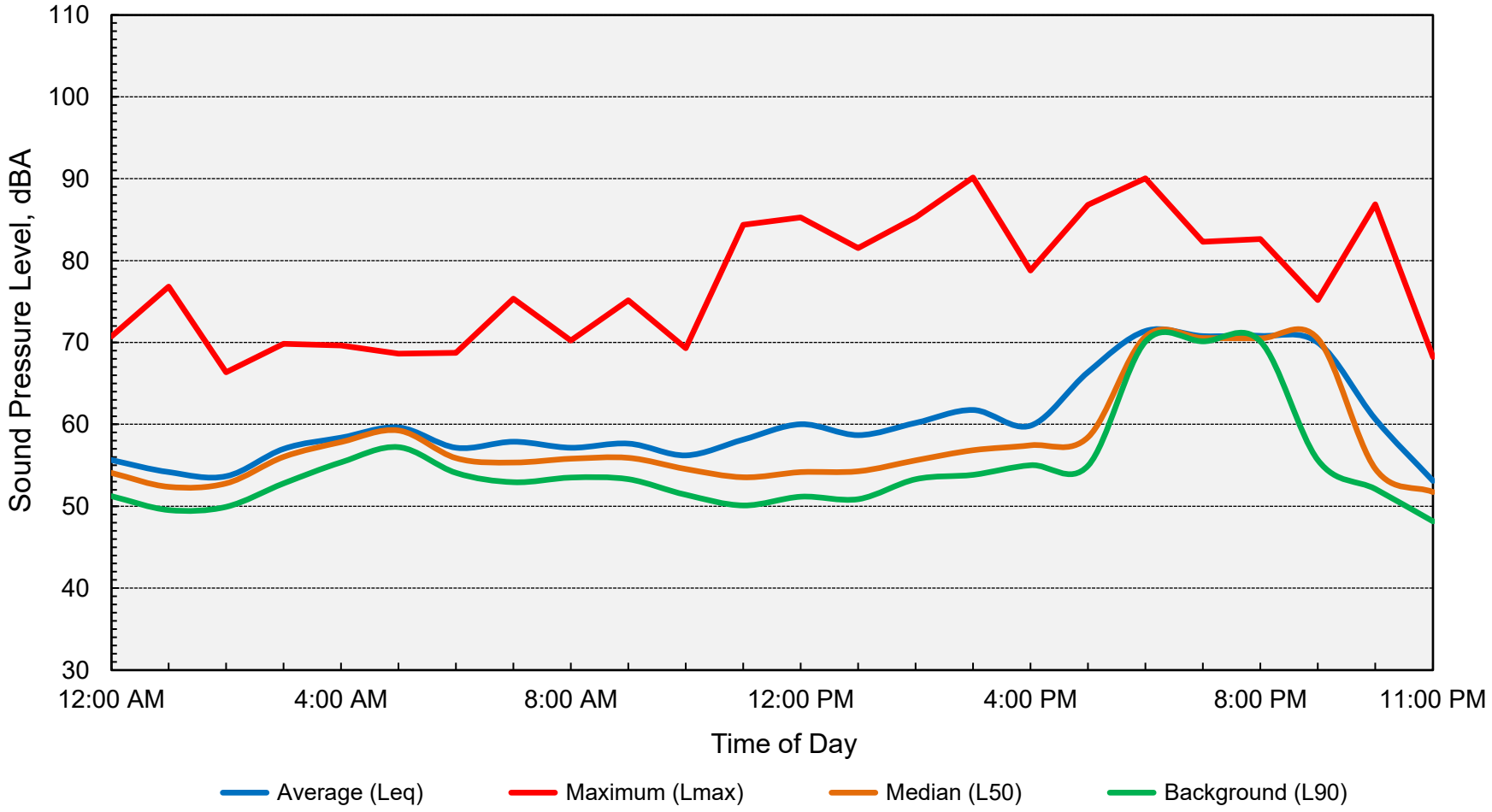
Appendix E-2
Ambient Noise Monitoring Results - Site 1
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020



Computed DNL = 64 dB

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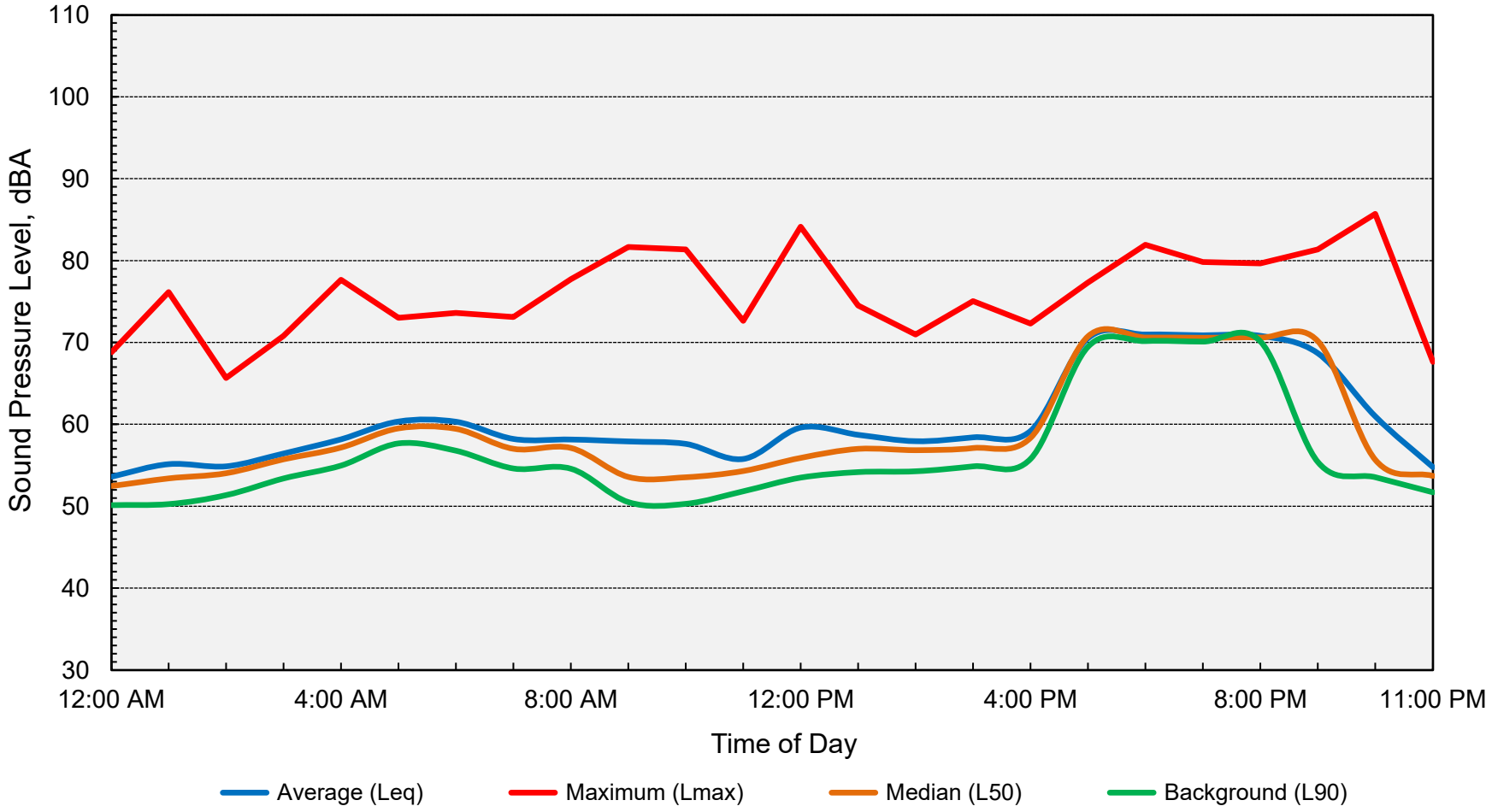
Appendix E-3
Ambient Noise Monitoring Results - Site 2
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020



Computed DNL = 67 dB

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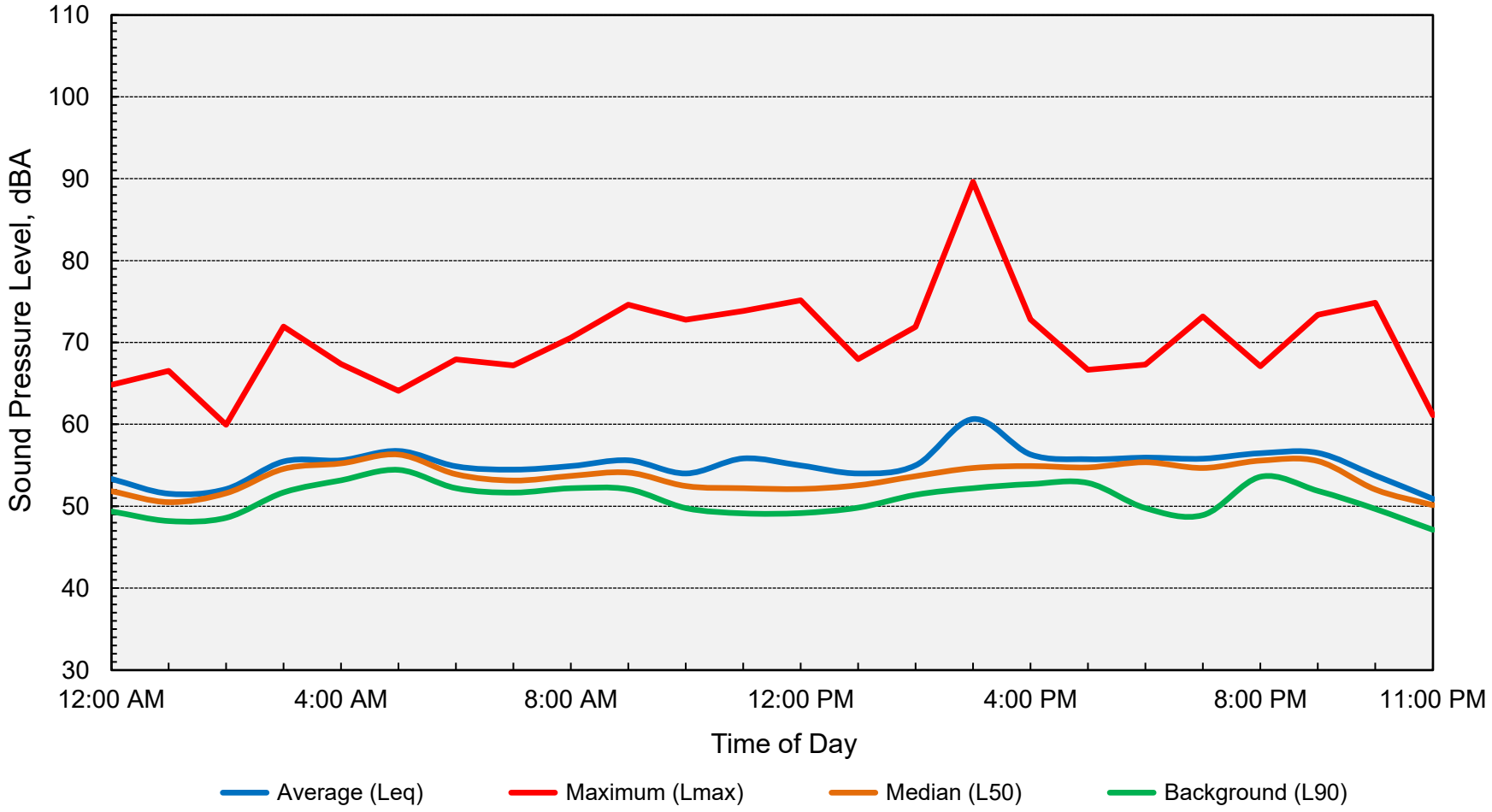
Appendix E-4
Ambient Noise Monitoring Results - Site 2
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020



Computed DNL = 67 dB

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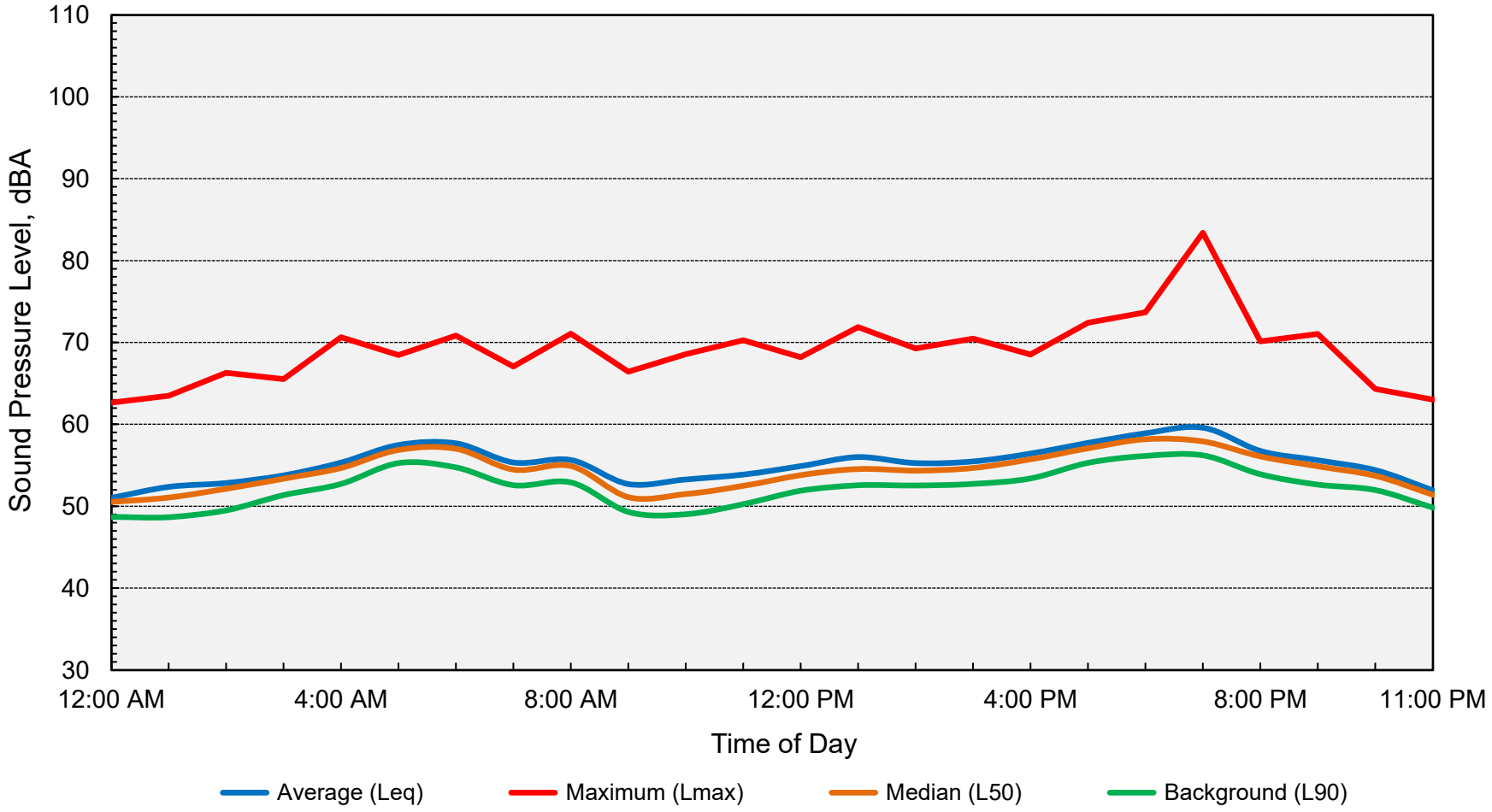
Appendix E-5
Ambient Noise Monitoring Results - Site 3
Nunes Road Travel Plaza - Stanislaus County, California
Wednesday, July 22, 2020



Computed DNL = 61 dB

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Appendix E-6
Ambient Noise Monitoring Results - Site 3
Nunes Road Travel Plaza - Stanislaus County, California
Thursday, July 23, 2020



Computed DNL = 61 dB

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