

TRAFFIC STUDY

MULTI-USE DEVELOPMENT

WHITESBRIDGE AVENUE & DEL NORTE AVENUE

KERMAN, CALIFORNIA

Prepared for:
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May 2024

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A handwritten signature in blue ink, appearing to read "Ian J. Parks", is written over a horizontal line.

Ian J. Parks, RCE 51825



TABLE OF CONTENTS

	<u>Pg</u>
INTRODUCTION	1
FIGURE 1: VICINITY MAP.....	2
FIGURE 2: LOCATION MAP.....	3
FIGURE 3: SITE PLAN	4
PROJECT TRIP GENERATION	6
TABLE 1: PROJECT TRIP GENERATION	6
TRIP DISTRIBUTION AND ASSIGNMENT.....	7
TABLE 2: PROJECT TRIP DISTRIBUTION	7
EXISTING AND FUTURE TRAFFIC.....	7
FIGURE 4: PROJECT PEAK HOUR TRAFFIC	9
FIGURE 5: 2024 PEAK HOUR TRAFFIC.....	10
FIGURE 6: 2024+PROJECT PEAK HOUR TRAFFIC.....	11
FIGURE 7: 2044 PEAK HOUR TRAFFIC.....	12
FIGURE 8: 2044+PROJECT PEAK HOUR TRAFFIC.....	13
INTERSECTION ANALYSIS	14
TABLE 3a: PM INTERSECTION LEVEL OF SERVICE	15
TABLE 3b: AM INTERSECTION LEVEL OF SERVICE	16
TRAFFIC SIGNAL WARRANT ANALYSIS.....	17
TABLE 4a: PM TRAFFIC SIGNAL WARRANTS.....	17
TABLE 4b: AM TRAFFIC SIGNAL WARRANTS.....	17
ROADWAY ANALYSIS	18
TABLE 5a: PM ROADWAY LEVEL OF SERVICE.....	18
TABLE 5b: AM ROADWAY LEVEL OF SERVICE.....	19
VMT ANALYSIS.....	20
TABLE 6a: TOTAL DAILY TRIPS BY PROJECT LAND USE	20
TABLE 6b: VMT ANALYSIS RESULTS.....	21
SUMMARY AND CONCLUSIONS	22
REFERENCES	23
APPENDIX.....	24

INTRODUCTION

The purpose of this study is to evaluate the potential traffic impacts of a proposed multi-use development located on the northwest corner of Whitesbridge Avenue & Del Norte Avenue in Kerman, CA. A vicinity map and location map are presented in Figures 1 and 2, respectively.

The proposed project consists of 200 single-family residential dwelling units, 100 multifamily dwelling units, 15,000 square feet of retail, and fast-food with drive-through consisting of 7,000 square feet. The site plan for the project is shown in Figure 3.

A. Land Use, Site and Study Area Boundaries

The existing zoning is AL-20 (Limited Agriculture) and the proposed zoning is residential.

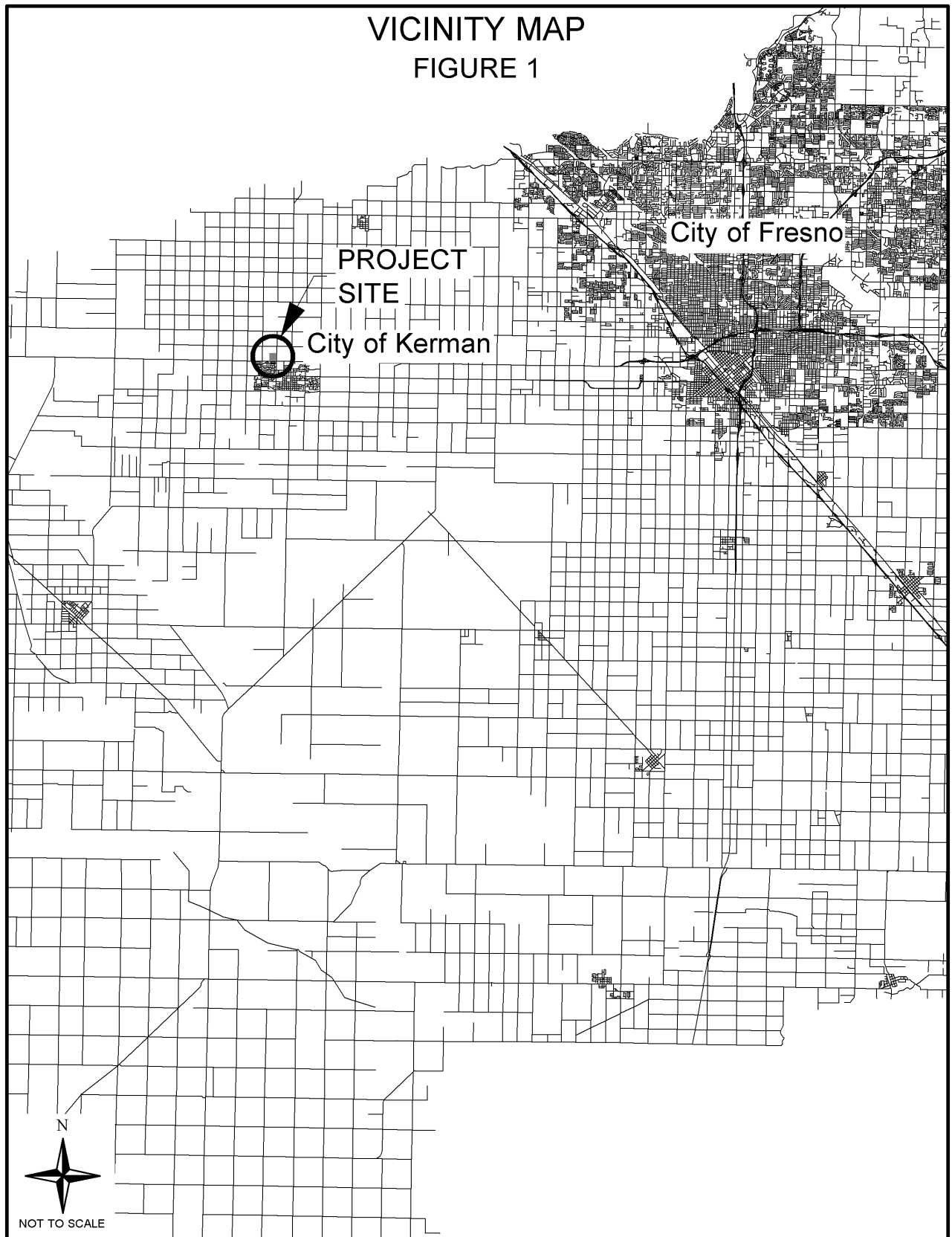
The study area includes a total of five stop-controlled intersections and four signalized intersections along Nielsen Avenue, Whitesbridge Avenue, and Kearney Boulevard.

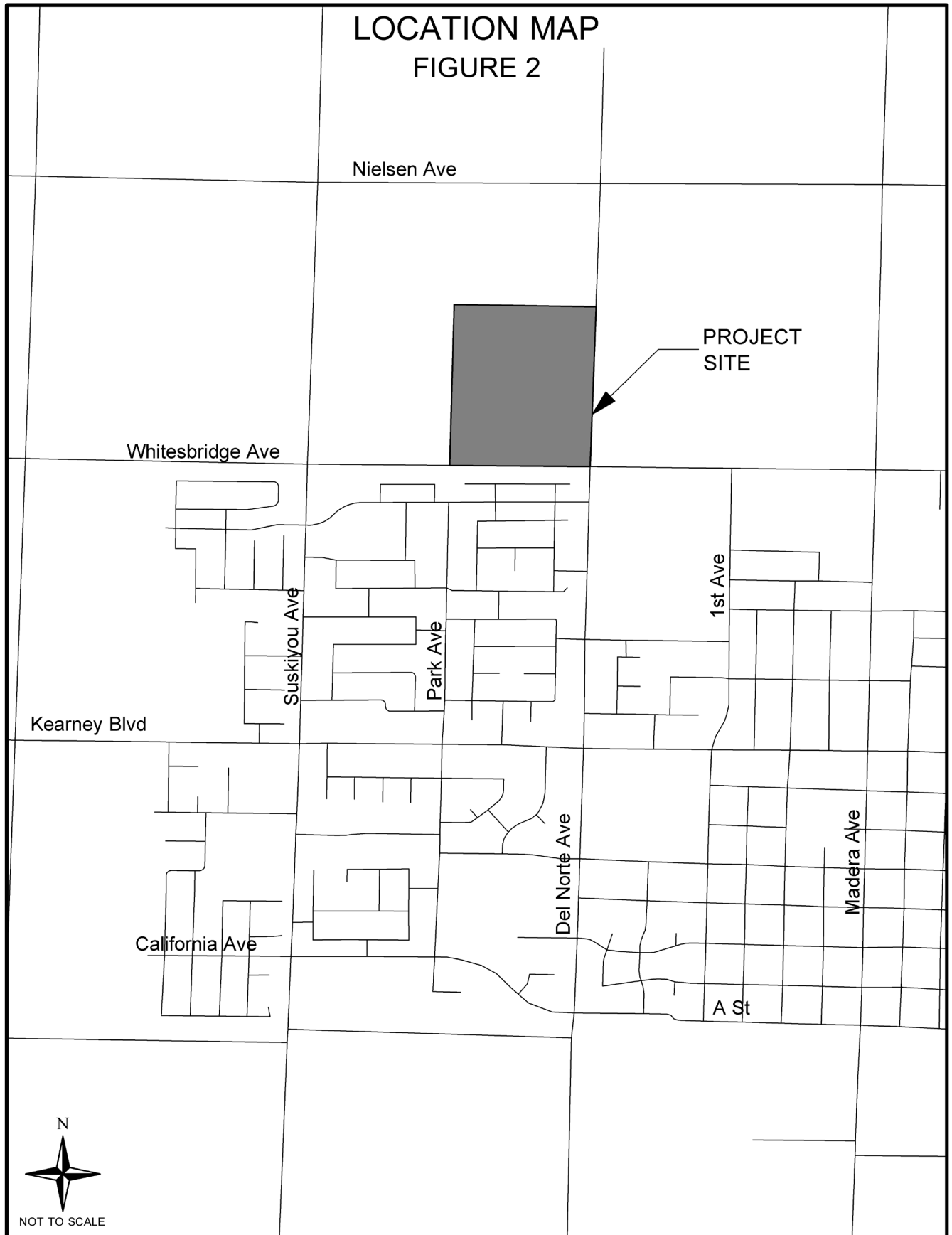
B. Existing Site Uses and Site Access

The site is currently vacant land. As currently planned, access to the proposed development would be provided along Del Norte Avenue and Whitesbridge Avenue.

C. Existing Uses in Vicinity of the Site

The site is bounded by Whitesbridge Avenue to the south, Del Norte Avenue to the east, residential land use to the west, and vacant land to the north.





SITE PLAN
FIGURE 3

THE VINCENT COMPANY

ARCHITECTS, INC.
1500 West Shaw, Ste. 304
Fresno, California 93711
Phone: 559 225 2602

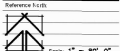
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PROPOSED MIX USE DEVELOPMENT
WHITESBRIDGE & DEL NORTE
NE CORNER OF W. WHITESBRIDGE AVENUE & N. DEL NORTE AVENUE
KIRMAN, CALIFORNIA



Revisions	Date
☐ DESIGN REVIEW	
☐ PLAN CHECK	
☐ BRICK CHECK	
☐ MEASURES	
☐ CONSTRUCTION	
☒ AS BUILT	

All drawings and written material
hereafter herein constitute original
work of the architect and may not be
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written consent of the architect.



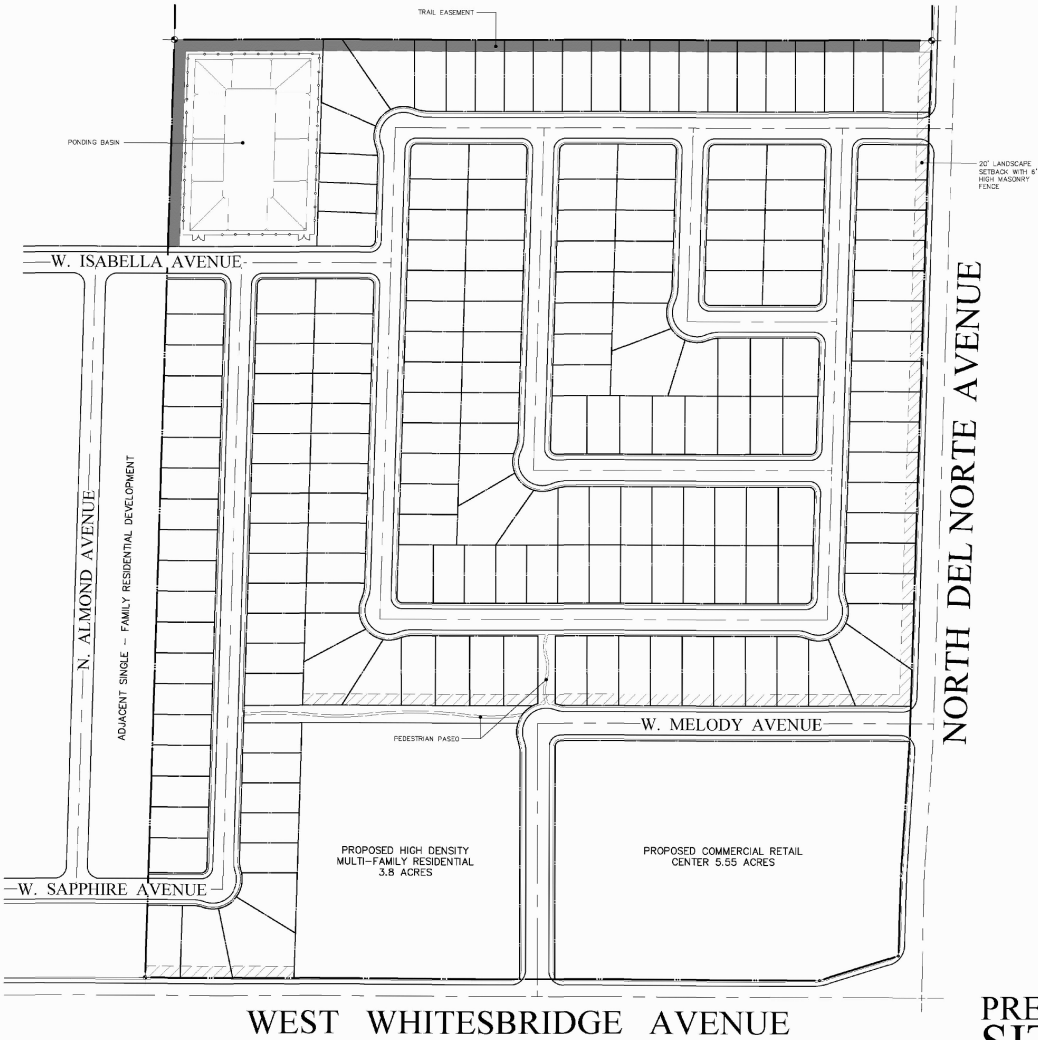
Scale: 1" = 80'-0"
Project Name: WHITESBRIDGE & DEL NORTE
KIRMAN, CALIFORNIA

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1	1

PRELIMINARY
SITE PLAN

1" = 80'-0"



D. Roadway Descriptions

Del Norte Avenue is a north-south collector that extends throughout the western portion of the city of Kerman. In the vicinity of the project, it exists as a two-lane roadway and provides access to agricultural, educational, and residential land uses.

Kearney Boulevard is an east-west collector that extends throughout the center of the city of Kerman. In the vicinity of the project, it exists as a two-lane, divided roadway and provides access to agricultural, educational, religious, and residential land uses.

Madera Avenue (SR 145) is a north-south expressway that extends throughout the center of the city of Kerman. In the vicinity of the project, it exists as a four-lane roadway and provides access to agricultural, commercial, and residential land uses.

Nielsen Avenue is an east-west collector that extends throughout the northern portion of the city of Kerman. In the vicinity of the project, it exists as a two-lane roadway and provides access to agricultural land uses.

Whitesbridge Avenue (SR 180) is an east-west expressway that extends throughout the northern portion of the city of Kerman. In the vicinity of the project, it exists as a three- to four-lane roadway and provides access to agricultural, commercial, religious, and residential land uses.

Siskiyou Avenue is a north-south collector that extends throughout the western portion of the city of Kerman. In the vicinity of the project, it exists as a two-lane roadway and provides access to agricultural, educational, and residential land uses.

Vineland Avenue is a north-south collector that extends throughout the eastern portion of the city of Kerman. In the vicinity of the project, it exists as a two-lane roadway and provides access to agricultural and residential land uses.

PROJECT TRIP GENERATION

The trip generation volumes for the residential development were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition. Trip generation and design hour volumes for all land uses are shown in Table 1.

The ADT, AM and PM peak hour rate equations, and peak hour directional splits for ITE Land Use Codes 210 (Single-Family Detached Housing), 220 (Multifamily Housing – Low Rise), 822 (Strip Retail <40k), and 934 (Fast-Food with Drive-Through) were used to estimate the project traffic.

Table 1
Project Trip Generation

Land Use			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT Rate	ADT	Rate	IN Split Trips	OUT Split Trips	Rate	IN Split Trips	OUT Split Trips
210	Single-Family Detached Housing	200 Dwelling Units	eq	1,909	eq	25% 35	75% 105	eq	63% 120	37% 71
220	Multifamily Housing (Low Rise)	100 Dwelling Units	eq	716	eq	24% 13	76% 41	eq	63% 40	37% 24
822	Strip Retail Plaza (<40k)	15 1000 sq ft GLA	eq	863	eq	60% 23	40% 15	eq	50% 52	50% 52
934	Fast-Food with Drive-Through	7 1000 sq ft GFA	467.48	3,272	44.61	51% 159	49% 153	33.03	52% 120	48% 111
SUBTOTAL				6,761		230	314		332	258
REDUCTIONS										
Internal Trips				207		9	8		9	8
Pass-By Trips				589		26	24		25	23
TOTAL				5,965		195	282		298	227

Internal trip capture rate of 5% applied to ITE Codes 822 and 934

Pass-by rate of 15% applied to external trips (calculated trips - internal trips) generated by ITE Codes 822 and 934

TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution in Table 2 represents the most likely travel routes for traffic accessing the project. Project traffic distribution was estimated based on a review of the potential draw from population centers within the region and the types of land uses involved. These assumptions were used to distribute project traffic as shown in Figure 4.

Table 2
Project Trip Distribution

Direction	Percent
North	5
East	40
South	50
West	5

EXISTING AND FUTURE TRAFFIC

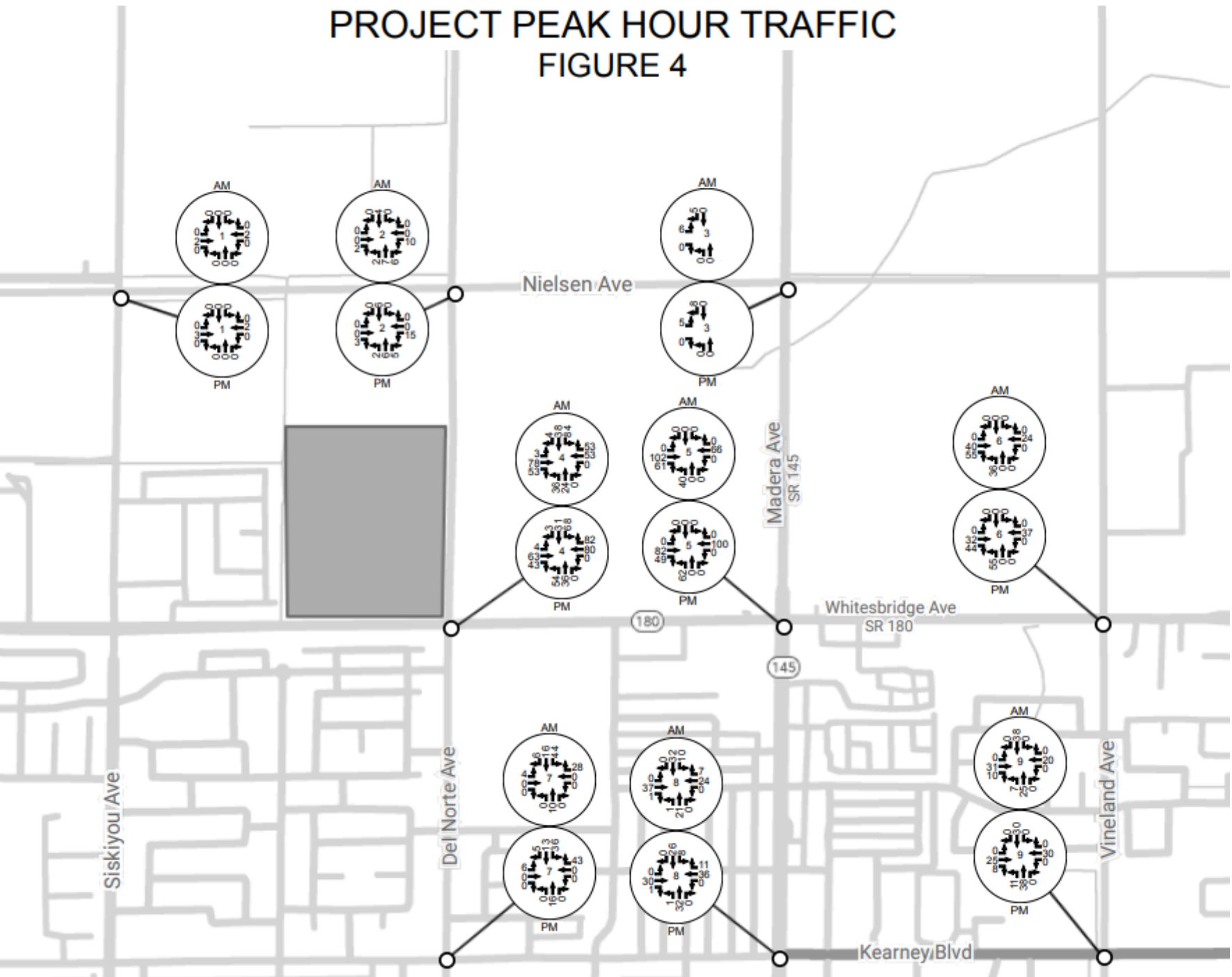
Weekday peak hour turning movements were counted at the following intersections in March 2024 (see Appendix for count data).

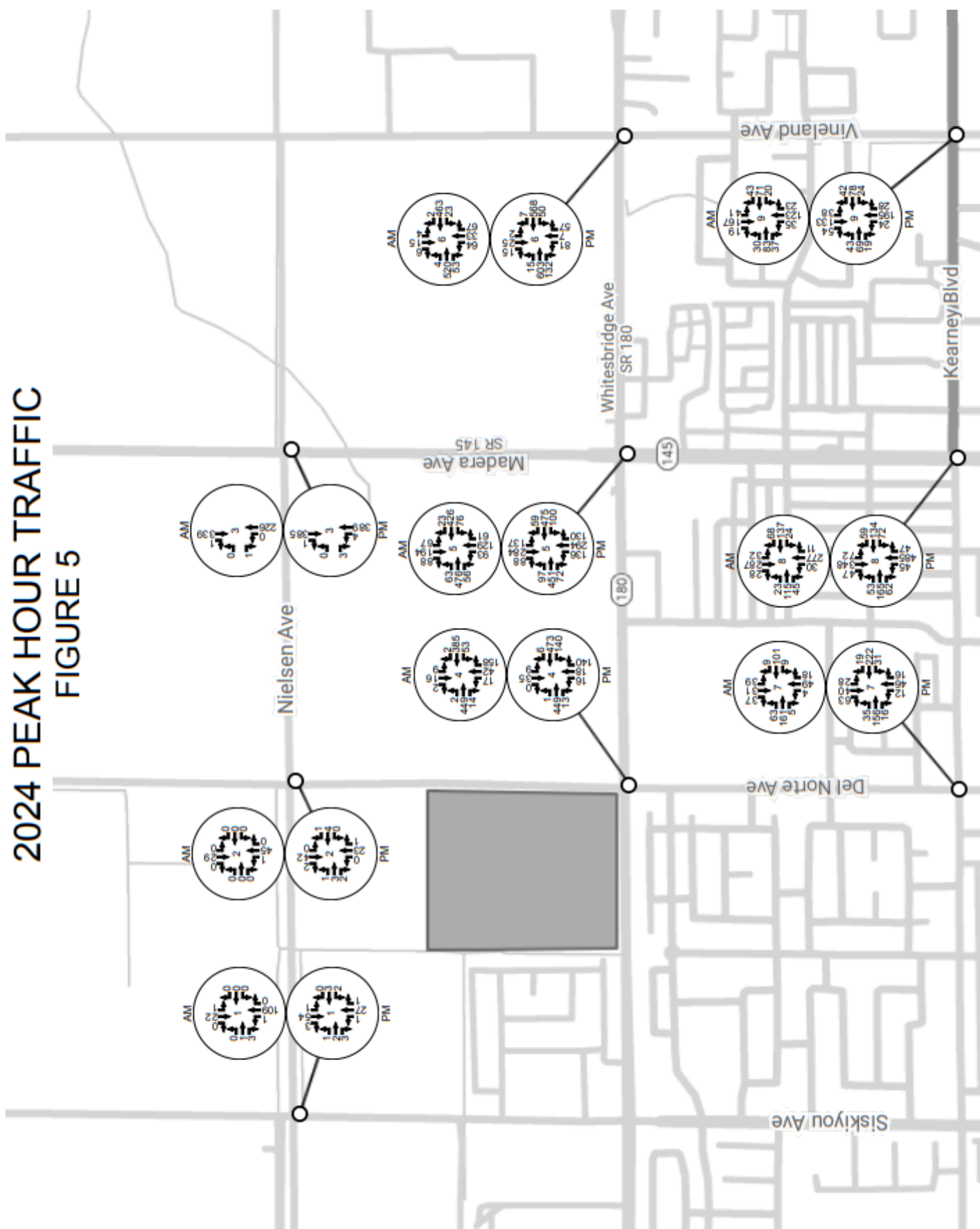
- Siskiyou Avenue & Nielsen Avenue
- Del Norte Avenue & Nielsen Avenue
- Madera Avenue & Nielsen Avenue
- Del Norte Avenue & Whitesbridge Avenue
- Madera Avenue & Whitesbridge Avenue
- Vineland Avenue & Whitesbridge Ave
- Del Norte Avenue & Kearney Boulevard
- Madera Avenue & Kearney Boulevard
- Vineland Avenue & Kearney Boulevard

Traffic counts were conducted between the hours 6:00 to 8:00 AM and 4:00 to 6:00 PM. AM Peak Hour was determined to be 7:00 to 8:00 AM and 4:30 to 5:30 PM and are shown in Figure 5. The scope of intersections was approved by the City of Kerman and Fresno County. Existing + Project peak hour volumes are shown in Figure 6.

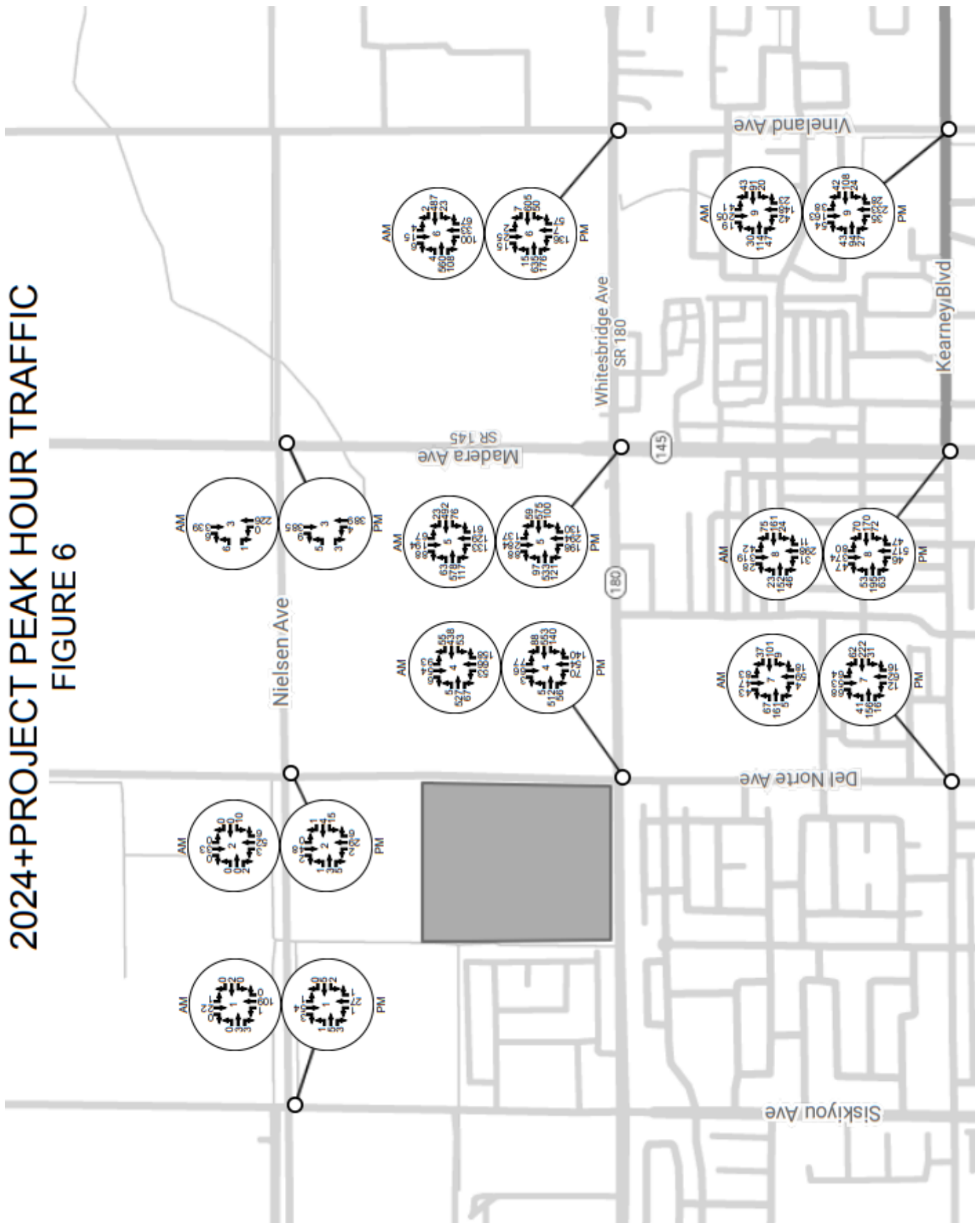
Annual growth rates ranging between 0.5% and 3% were applied to existing traffic volumes to estimate future traffic volumes for the year 2044. These growth rates were estimated based on TCAG traffic model data. Future peak hour volumes are shown in Figures 7 and 8.

PROJECT PEAK HOUR TRAFFIC FIGURE 4

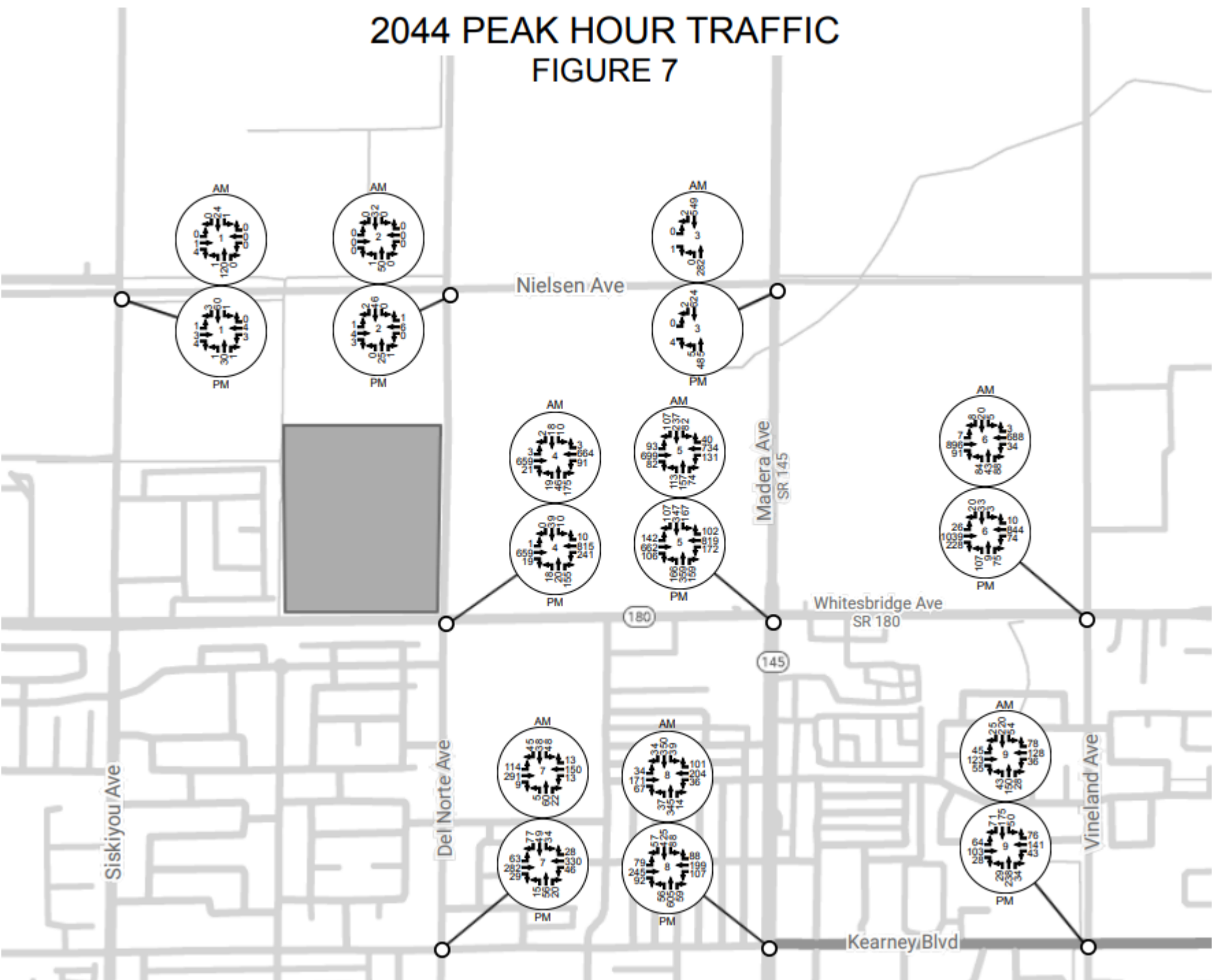




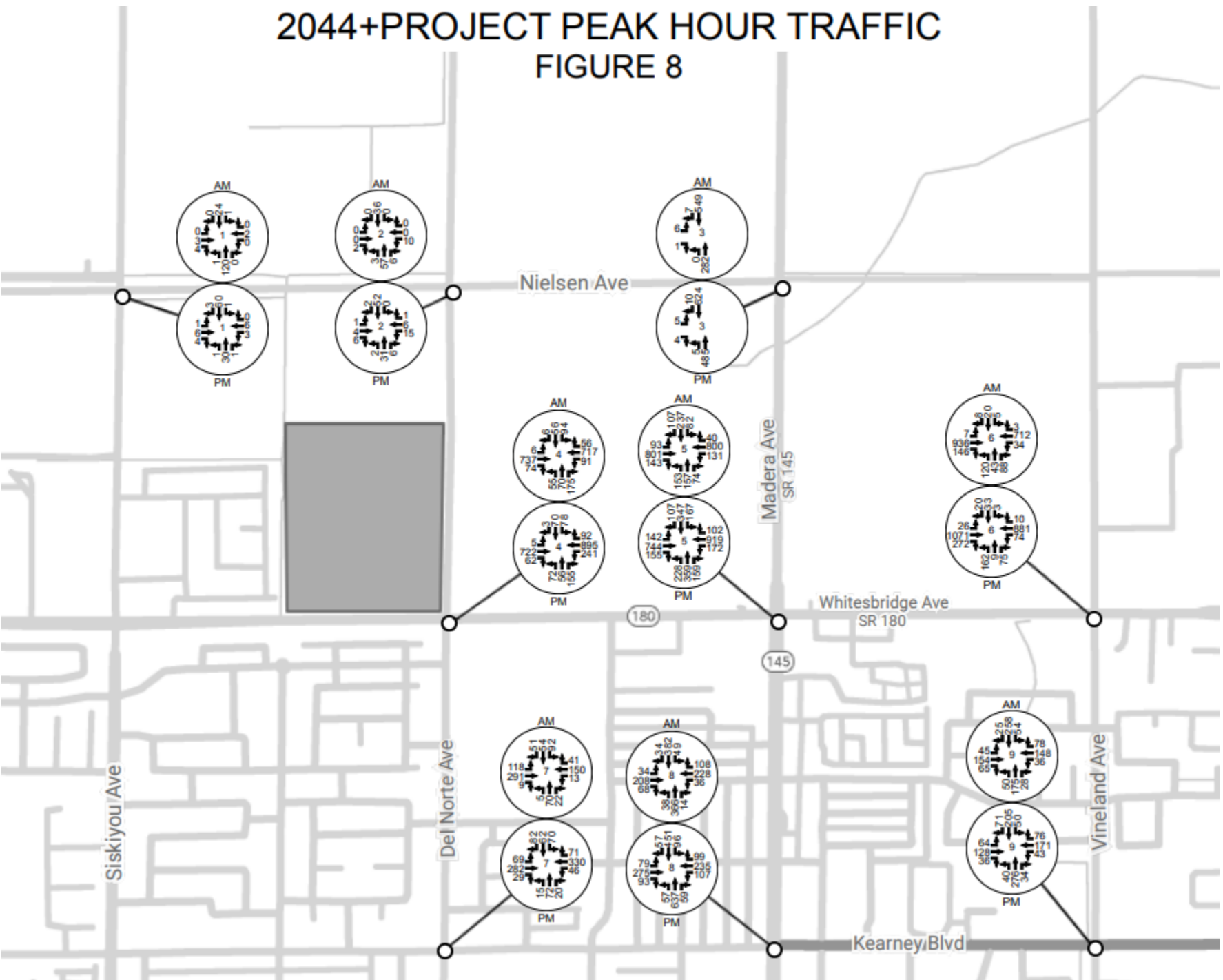
2024+PROJECT PEAK HOUR TRAFFIC
FIGURE 6



2044 PEAK HOUR TRAFFIC FIGURE 7



2044+PROJECT PEAK HOUR TRAFFIC FIGURE 8



INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro software from Trafficware.

- Existing (2024)
- Existing (2024) + Project
- Future (2044)
- Future (2044) + Project

Criteria for intersection level of service (LOS) are shown in the tables below.

LEVEL OF SERVICE CRITERIA UNSIGNALIZED INTERSECTION

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤ 10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

LEVEL OF SERVICE CRITERIA SIGNALIZED INTERSECTIONS

Volume/Capacity	Control Delay (sec/veh)	Level of Service
< 0.60	≤ 10	A
0.61 - 0.70	> 10 and ≤ 20	B
0.71 - 0.80	> 20 and ≤ 35	C
0.81 - 0.90	> 35 and ≤ 55	D
0.91 - 1.00	> 55 and ≤ 80	E
> 1.0	> 80	F

Level of service for the study intersections is presented in Tables 3a and 3b. The level of service goal for roadway facilities in the City of Kerman is LOS C. Delays are shown for all intersections operating below LOS C.

Table 3a
PM Intersection Level of Service

#	Intersection	Control Type	2024	2024+ Project	2044	2044+ Project
1	Siskiyou Ave & Nielsen Ave	ASWC	A	A	A	A
2	Del Norte & Nielsen Ave	NB SB	A A	A A	A A	A A
3	Madera Ave & Nielsen Ave	EB	B	B	B	C
4	Del Norte Ave & Whitesbridge Ave	Signal	B	C	C	C
5	Madera Ave & Whitesbridge Ave	Signal	D (42.6)	D (44.8)	D (47.9)	D (53.2)
6	Vineland Ave & Whitesbridge Ave	Signal	B	B	C	C
7	Del Norte Ave & Kearney Blvd	AWSC	B	B	C	C
8	Madera Ave & Kearney Blvd	Signal	D (35.1)	D (39.7)	D (36.0)	D (39.0)
9	Vineland Ave & Kearney Blvd	AWSC	B	B	C	C

Intersections 5 & 8 operate at LOS D prior to the addition of project traffic. Therefore, the project does not degrade the intersection.

Table 3b
AM Intersection Level of Service

#	Intersection	Control Type	2024	2024+ Project	2044	2044+ Project
1	Siskiyou Ave & Nielsen Ave	AWSC	A	A	A	A
2	Del Norte & Nielsen Ave	NB SB	A A	A A	A A	A A
3	Madera Ave & Nielsen Ave	EB	B	B	B	C
4	Del Norte Ave & Whitesbridge Ave	Signal	C	C	C	C
5	Madera Ave & Whitesbridge Ave	Signal	D (37.9)	D (42.5)	D (43.6)	D (46.2)
6	Vineland Ave & Whitesbridge Ave	Signal	C	C	C	C
7	Del Norte Ave & Kearney Blvd	AWSC	A	A	B	B
8	Madera Ave & Kearney Blvd	Signal	C	C	D (37.7)	D (39.0)
9	Vineland Ave & Kearney Blvd	AWSC	B	B	B	C

Intersections 5 & 8 operate at LOS D prior to the addition of project traffic. Therefore, the project does not degrade the intersection.

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for the unsignalized intersection within the study based on the California Manual on Uniform Traffic Control Devices (MUTCD). Peak hour signal warrants assess delay to traffic on the minor street approaches when entering or crossing a major street. Signal warrant analysis results for PM & AM peak hour are shown in Tables 4a and 4b, respectively.

Table 4a
PM Traffic Signal Warrants

#	Intersection	2024			2024+Project			2044			2044+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	Siskiyou Ave at Nielsen Ave	87	6	NO	87	9	NO	96	8	NO	96	11	NO
2	N Del Norte Ave at Nielsen Ave	68	6	NO	87	20	NO	74	8	NO	93	22	NO
3	S Madera Ave at Nielsen Ave	779	3	NO	787	8	NO	1116	4	NO	1124	9	NO
7	N Del Norte Ave at W Kearney Blvd	479	131	NO	528	185	NO	778	160	NO	827	214	YES
9	S Vineland Ave at W Kearney Blvd	472	144	NO	551	174	NO	597	260	YES	676	290	YES

Table 4b
AM Traffic Signal Warrants

#	Intersection	2024			2024+Project			2044			2044+Project		
		Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	Siskiyou Ave at Nielsen Ave	133	4	NO	133	6	NO	146	5	NO	146	7	NO
2	Del Norte Ave at Nielsen Ave	75	0	NO	94	10	NO	83	0	NO	102	10	NO
3	Madera Ave at Nielsen Ave	566	1	NO	571	7	NO	833	1	NO	838	7	NO
7	Del Norte Ave at Kearney Blvd	348	107	NO	380	173	NO	590	131	NO	622	197	NO
9	Vineland Ave at Kearney Blvd	408	150	NO	478	191	NO	520	242	NO	590	264	YES

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service or operate below an acceptable level of service and not meet signal warrant criteria.

ROADWAY ANALYSIS

A capacity analysis of the study roadways was conducted using Table 4 in the State of Florida Department of Transportation *Quality/Level of Service Handbook* dated June 2020 (see Appendix). The level of service goal within the study limits is LOS “C”. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2024)
- Existing (2024) + Project
- Future (2044)
- Future (2044) + Project

Table 5a
PM Roadway Level of Service

Roadway Segment	2024 Two-Way LOS		2024+Project Two-Way LOS		2044 Two-Way LOS		2044+Project Two-Way LOS	
	VOL	LOS	VOL	LOS	VOL	LOS	VOL	LOS
Nielsen Ave: Siskiyou Ave - Del Norte Ave	9	C	36	C	12	C	39	C
Nielsen Ave: Del Norte Ave - Madera Ave	12	C	17	C	16	C	21	C
Whitesbridge Ave: Del Norte Ave - Madera Ave	1319	C	1612	C	2002	C	2295	C
Whitesbridge Ave: Madera Ave - Vineland Ave	1319	C	1608	C	2002	C	2291	C
Kearney Blvd: Del Norte Ave - Madera Ave	1414	C	1593	C	2264	C	2443	C
Kearney Blvd: Madera Ave - Vineland Ave	506	C	583	C	740	C	817	C
Del Norte Ave: Nielsen Ave - Whitesbridge Ave	362	C	445	C	492	C	575	C
Del Norte Ave: Whitesbridge Ave - Kearney Blvd	69	C	368	C	80	C	379	C
Madera Ave: Nielsen Ave - Whitesbridge Ave	362	C	524	C	492	C	654	C
Madera Ave: Whitesbridge Ave - Kearney Blvd	959	C	1069	C	1224	C	1334	C
Vineland Ave: Whitesbridge Ave - Kearney Blvd	1064	C	1140	C	1344	C	1420	C
N Vineland Ave: W Whitesbridge Ave - W Kearney Blvd	505	C	603	C	674	C	772	C

Table 5b
AM Roadway Level of Service

Roadway Segment	2024 Two-Way LOS		2024+Project Two-Way LOS		2044 Two-Way LOS		2044+Project Two-Way LOS	
	VOL	LOS	VOL	LOS	VOL	LOS	VOL	LOS
Nielsen Ave: Siskiyou Ave - Del Norte Ave	2	C	6	C	2	C	6	C
Nielsen Ave: Del Norte Ave - Madera Ave	2	C	29	C	3	C	30	C
Whitesbridge Ave: Del Norte Ave - Madera Ave	1056	C	1324	C	1602	C	1870	C
Whitesbridge Ave: Madera Ave - Vineland Ave	1202	C	1466	C	1828	C	2092	C
Kearney Blvd: Del Norte Ave - Madera Ave	1129	C	1293	C	1774	C	1938	C
Kearney Blvd: Madera Ave - Vineland Ave	378	C	448	C	547	C	617	C
Del Norte Ave: Nielsen Ave - Whitesbridge Ave	75	C	151	C	82	C	158	C
Del Norte Ave: Whitesbridge Ave - Kearney Blvd	228	C	334	C	307	C	413	C
Madera Ave: Nielsen Ave - Whitesbridge Ave	300	C	400	C	832	C	932	C
Madera Ave: Whitesbridge Ave - Kearney Blvd	715	C	815	C	903	C	1003	C
Vineland Ave: Whitesbridge Ave - Kearney Blvd	423	C	521	C	572	C	670	C

All roadways within the scope of the project operate at acceptable levels of service with and without project traffic.

VMT ANALYSIS

An analysis of project VMT (vehicle miles traveled) was conducted following guidance provided in *Fresno County SB 743 Implementation Regional Guidelines*, Fresno Council of Governments, dated January 2021 (VMT Guidelines). The analysis involved comparing an estimate of VMT attributable to the project to the County threshold and assessing whether project VMT would result in a significant transportation impact under the California Environmental Quality Act (CEQA).

Project Screening

The VMT Guidelines contain criteria for determining whether a land use project may be screened from a detailed VMT analysis. Projects meeting one or more of these “screening” criteria are presumed to create a less than significant transportation impact and no further analysis is required. However, as per the VMT Guidelines, these criteria may not be used for this study since the project requires a General Plan Amendment and zone change. Therefore, a detailed VMT analysis was conducted.

Mixed-Use Projects

The project includes a mix of residential and retail land uses. As per the VMT Guidelines, a land development with mixed uses may be analyzed either based on individual project land uses or the project’s predominant land use. The latter approach was taken for this study since, based on the project trip generation estimates presented in Table 1, the retail land uses generate over 60 percent of the daily project trips, as shown in Table 6a.

Table 6a
Total Daily Trips by Project Land Use

Project Land Use	Development Type(s)	Daily Trips	Percent of Total Trips
Residential	Single-Family Detached Housing Multifamily Housing (Low Rise)	2,625	38.8%
Retail	Strip Retail Plaza (<40,000 SF) Fast-Food Restaurant w/Drive-Through Window	4,135	61.2%
TOTAL		6,760	100%

Detailed Analysis

As defined in the VMT Guidelines, the appropriate metric for analyzing land development projects with retail land uses is total VMT (daily) for the region (Fresno County). Projects resulting in a net increase in total VMT would be expected to create a significant transportation impact and mitigation would be required.

In accordance with the VMT Guidelines, the detailed analysis was conducted using the Fresno COG ABM. Model runs for the analysis were developed and generated by Fresno COG staff and accounted for internal trip capture (see Appendix for model output). The VMT analysis results are presented in Table 6b.

Table 6b
VMT Analysis Results

Project Land Use	Metric: Total Regional VMT		Significant Impact	Reduction Needed
	NO Project	PLUS Project		
Retail	23,332,228	23,321,660	NO	- - -

As shown above, the project results in a net decrease in total VMT. Therefore, the project is not expected to result in a significant transportation impact under CEQA and no mitigation is required.

SUMMARY AND CONCLUSIONS

The purpose of this study is to evaluate the potential traffic impacts of a proposed multi-use development located on the northwest corner of Whitesbridge Avenue & Del Norte Avenue in Kerman, CA. The study included both level of service (LOS) and vehicle miles traveled (VMT) analyses.

Level of Service Analysis

All intersections currently operate at an acceptable level of service and are anticipated to do so through 2044, prior to and with the addition of project traffic. Therefore, no improvements are required.

Roadway Capacity

All roadway segments within the scope of the study currently operate at or above LOS C and are expected to continue to do so through the year 2044, prior to and with the addition of project traffic. Therefore, no improvements are required.

VMT

The project results in a net decrease in total VMT for the region. Therefore, the project is expected to create a less than significant transportation impact under CEQA.

REFERENCES

1. Annual Traffic Census, FCOG
2. City of Kerman 2040 General Plan, July 2020.
3. Highway Capacity Manual, Special Report 209, Transportation Research Board
4. California Manual on Uniform Traffic Control Devices for Streets and Highways, 2014 Edition, Federal Highway Administration (FHA)
5. Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE)

APPENDIX

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	3	2	3	0	1	27	1	1	54	3
Future Volume (vph)	1	2	3	2	3	0	1	27	1	1	54	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932						0.996			0.994	
Flt Protected		0.992			0.980			0.998			0.999	
Satd. Flow (prot)	0	1722	0	0	1825	0	0	1852	0	0	1850	0
Flt Permitted		0.992			0.980			0.998			0.999	
Satd. Flow (perm)	0	1722	0	0	1825	0	0	1852	0	0	1850	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		588			2659			1363			540	
Travel Time (s)		7.3			33.0			16.9			6.7	
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
Adj. Flow (vph)	1	2	3	2	3	0	1	29	1	1	59	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	5	0	0	31	0	0	63	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 13.4%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection

Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	3	2	3	0	1	27	1	1	54	3
Future Vol, veh/h	1	2	3	2	3	0	1	27	1	1	54	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	3	2	3	0	1	29	1	1	59	3
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, s/veh	6.9	7.2	7.1	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	17%	40%	2%
Vol Thru, %	93%	33%	60%	93%
Vol Right, %	3%	50%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	6	5	58
LT Vol	1	1	2	1
Through Vol	27	2	3	54
RT Vol	1	3	0	3
Lane Flow Rate	32	7	5	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.035	0.007	0.006	0.069
Departure Headway (Hd)	3.989	3.835	4.183	3.951
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	900	929	853	910
Service Time	2.003	1.874	2.223	1.961
HCM Lane V/C Ratio	0.036	0.008	0.006	0.069
HCM Control Delay, s/veh	7.1	6.9	7.2	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	3	2	0	4	1	0	23	1	0	42	2
Future Volume (vph)	1	3	2	0	4	1	0	23	1	0	42	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.973				0.995		0.994	
Flt Protected	0.992											
Satd. Flow (prot)	0	1765	0	0	1812	0	0	1853	0	0	1852	0
Flt Permitted	0.992											
Satd. Flow (perm)	0	1765	0	0	1812	0	0	1853	0	0	1852	0
Link Speed (mph)	55				55				55		55	
Link Distance (ft)	2659				2643				2647		315	
Travel Time (s)	33.0				32.8				32.8		3.9	
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
Adj. Flow (vph)	1	3	2	0	4	1	0	25	1	0	46	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	5	0	0	26	0	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				12		12	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free				Stop		Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 13.3%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection

Int Delay, s/veh 8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	2	0	4	1	0	23	1	0	42	2
Future Vol, veh/h	1	3	2	0	4	1	0	23	1	0	42	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	-	-	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	3	2	0	4	1	0	25	1	0	46	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	5	0	0	5	0	0	35	11	4	24	12	5
Stage 1	-	-	-	-	-	-	6	6	-	5	5	-
Stage 2	-	-	-	-	-	-	29	5	-	19	7	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1616	-	-	1616	-	-	971	884	1080	987	883	1078
Stage 1	-	-	-	-	-	-	1016	891	-	1017	892	-
Stage 2	-	-	-	-	-	-	988	892	-	1000	890	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1616	-	-	1616	-	-	930	883	1080	964	882	1078
Mov Cap-2 Maneuver	-	-	-	-	-	-	930	883	-	964	882	-
Stage 1	-	-	-	-	-	-	1015	890	-	1016	892	-
Stage 2	-	-	-	-	-	-	936	892	-	970	889	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.2	0	9.2	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	890	1616	-	-	1616	-	-	889
HCM Lane V/C Ratio	0.029	0.001	-	-	-	-	-	0.054
HCM Control Delay (s/veh)	9.2	7.2	0	-	0	-	-	9.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q (veh)	0.1	0	-	-	0	-	-	0.2

Lanes, Volumes, Timings
3: S Madera Ave & Nielsen Ave

PM Existing
05/23/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	4	389	385	1
Future Volume (vph)	0	3	4	389	385	1
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1484	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1484	0	0	1863	1863	0
Link Speed (mph)	55		55		55	
Link Distance (ft)	2643		2662		464	
Travel Time (s)	32.8		33.0		5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	3	4	423	418	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	0	427	419	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15	9		
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 33.7%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	3	4	389	385	1
Future Vol, veh/h	0	3	4	389	385	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	0	3	4	423	418	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	850	419	419
Stage 1	419	-	-
Stage 2	431	-	-
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	331	634	1140
Stage 1	664	-	-
Stage 2	655	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	329	634	1140
Mov Cap-2 Maneuver	329	-	-
Stage 1	661	-	-
Stage 2	655	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1140	-	634	-	-
HCM Lane V/C Ratio	0.004	-	0.005	-	-
HCM Control Delay (s/veh)	8.2	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	449	13	140	473	6	16	18	140	9	35	0
Future Volume (vph)	1	449	13	140	473	6	16	18	140	9	35	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.98				
Frt			0.850		0.998			0.867				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1590	0	1630	1863	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3531	0	1630	1590	0	1630	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181		2			152				
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	1	488	14	152	514	7	17	20	152	10	38	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	488	14	152	521	0	17	172	0	10	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	31.2	31.2	21.4	43.7		8.9	38.4		9.0	38.5	
Total Split (%)	8.9%	31.2%	31.2%	21.4%	43.7%		8.9%	38.4%		9.0%	38.5%	
Maximum Green (s)	4.0	26.3	26.3	16.5	38.8		4.0	33.5		4.1	33.6	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.1	53.2	53.2	17.4	72.9		7.0	15.6		5.0	12.9	
Actuated g/C Ratio	0.06	0.53	0.53	0.17	0.73		0.07	0.16		0.05	0.13	
v/c Ratio	0.01	0.26	0.02	0.54	0.20		0.15	0.46		0.12	0.16	
Control Delay (s/veh)	45.0	16.5	0.0	26.6	5.9		46.9	10.6		49.0	35.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.0	16.5	0.0	26.6	5.9		46.9	10.6		49.0	35.9	
LOS	D	B	A	C	A		D	B		D	D	
Approach Delay (s/veh)		16.1			10.6			13.8			38.7	
Approach LOS		B			B			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 52 (52%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay (s/veh): 13.9

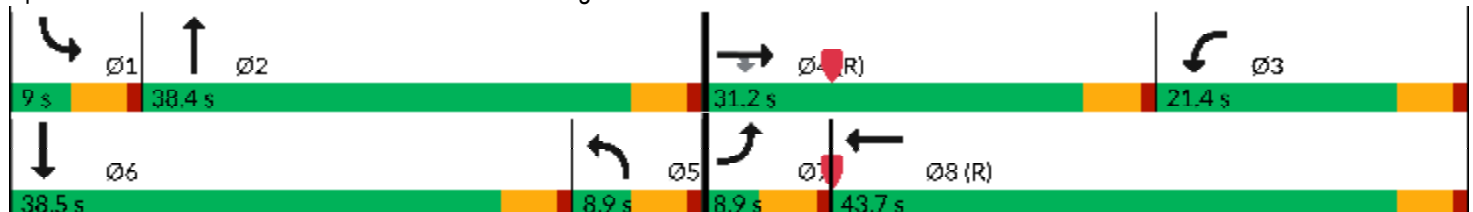
Intersection LOS: B

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	449	13	140	473	6	16	18	140	9	35	0
Future Volume (veh/h)	1	449	13	140	473	6	16	18	140	9	35	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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			
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	1	488	14	152	514	7	17	20	152	10	38	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	17	967	390	631	2320	32	160	30	230	31	161	0
Arrive On Green	0.01	0.27	0.27	0.77	1.00	1.00	0.10	0.16	0.16	0.02	0.09	0.00
Sat Flow, veh/h	1641	3554	1432	1641	3588	49	1641	184	1395	1641	1870	0
Grp Volume(v), veh/h	1	488	14	152	254	267	17	0	172	10	38	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1432	1641	1777	1860	1641	0	1578	1641	1870	0
Q Serve(g_s), s	0.1	11.6	0.7	2.6	0.0	0.0	0.9	0.0	10.3	0.6	1.9	0.0
Cycle Q Clear(g_c), s	0.1	11.6	0.7	2.6	0.0	0.0	0.9	0.0	10.3	0.6	1.9	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.88	1.00		0.00
Lane Grp Cap(c), veh/h	17	967	390	631	1149	1203	160	0	260	31	161	0
V/C Ratio(X)	0.06	0.50	0.04	0.24	0.22	0.22	0.11	0.00	0.66	0.33	0.24	0.00
Avail Cap(c_a), veh/h	80	967	390	631	1149	1203	160	0	543	82	645	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.0	30.7	26.8	7.4	0.0	0.0	41.2	0.0	39.5	48.4	42.6	0.0
Incr Delay (d2), s/veh	1.5	1.9	0.2	0.1	0.3	0.3	0.3	0.0	2.9	6.0	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.8	0.2	0.8	0.1	0.1	0.4	0.0	4.0	0.3	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.5	32.6	26.9	7.6	0.3	0.3	41.5	0.0	42.4	54.5	43.4	0.0
LnGrp LOS	D	C	C	A	A	A	D		D	D	D	
Approach Vol, veh/h	503				673				189			
Approach Delay, s/veh	32.5				2.0				42.3			
Approach LOS	C				A				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	20.5	42.5	31.2	13.7	12.6	5.0	68.6				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.1	33.5	16.5	26.3	4.0	33.6	4.0	38.8				
Max Q Clear Time (g_c+I1), s	2.6	12.3	4.6	13.6	2.9	3.9	2.1	2.0				
Green Ext Time (p_c), s	0.0	0.6	0.3	1.7	0.0	0.1	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	19.7											
HCM 6th LOS	B											

Lanes, Volumes, Timings

5: S Madera Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	451	72	100	475	59	136	294	130	137	284	88
Future Volume (vph)	97	451	72	100	475	59	136	294	130	137	284	88
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.979			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3456	0	1630	3467	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3456	0	1630	3467	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			14				181			181
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	105	490	78	109	516	64	148	320	141	149	309	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	568	0	109	580	0	148	320	141	149	309	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	13.7	34.1		15.0	35.4		16.7	32.7	32.7	18.2	34.2	34.2
Total Split (%)	13.7%	34.1%		15.0%	35.4%		16.7%	32.7%	32.7%	18.2%	34.2%	34.2%
Maximum Green (s)	8.8	29.2		10.1	30.5		11.8	27.8	27.8	13.3	29.3	29.3
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	11.7	23.1		11.6	23.0		16.8	17.5	17.5	31.8	32.5	32.5
Actuated g/C Ratio	0.12	0.23		0.12	0.23		0.17	0.18	0.18	0.32	0.33	0.33
v/c Ratio	0.56	0.70		0.58	0.72		0.54	0.52	0.35	0.29	0.27	0.16
Control Delay (s/veh)	40.4	28.5		54.5	39.4		30.2	26.0	5.5	32.5	27.4	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	40.4	28.5		54.5	39.4		30.2	26.0	5.5	32.5	27.4	0.6
LOS	D	C		D	D		C	C	A	C	C	A
Approach Delay (s/veh)		30.3			41.8			22.3			24.1	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay (s/veh): 30.2

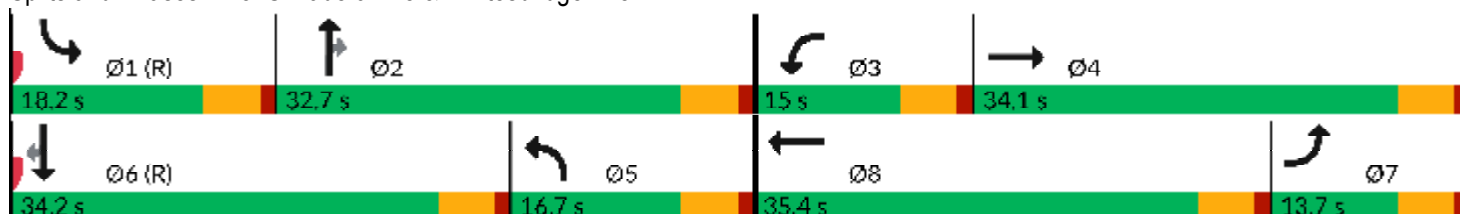
Intersection LOS: C

Intersection Capacity Utilization 64.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	451	72	100	475	59	136	294	130	137	284	88
Future Volume (veh/h)	97	451	72	100	475	59	136	294	130	137	284	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.96	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	105	490	78	109	516	64	148	320	141	149	309	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	654	103	148	677	84	645	574	230	615	509	204
Arrive On Green	0.06	0.14	0.14	0.09	0.21	0.20	0.13	0.05	0.05	0.38	0.14	0.14
Sat Flow, veh/h	1641	3063	485	1641	3168	391	1641	3554	1425	1641	3554	1423
Grp Volume(v), veh/h	105	283	285	109	288	292	148	320	141	149	309	96
Grp Sat Flow(s),veh/h/ln	1641	1777	1771	1641	1777	1783	1641	1777	1425	1641	1777	1423
Q Serve(g_s), s	6.3	15.3	15.5	6.5	15.2	15.4	8.1	8.8	9.7	6.2	8.2	6.2
Cycle Q Clear(g_c), s	6.3	15.3	15.5	6.5	15.2	15.4	8.1	8.8	9.7	6.2	8.2	6.2
Prop In Lane	1.00		0.27	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	147	379	378	148	380	381	645	574	230	615	509	204
V/C Ratio(X)	0.71	0.75	0.75	0.74	0.76	0.77	0.23	0.56	0.61	0.24	0.61	0.47
Avail Cap(c_a), veh/h	159	535	533	180	558	560	645	1020	409	615	1073	430
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.92	0.92	0.92	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	40.3	40.4	44.3	36.9	37.1	29.9	43.9	44.3	21.5	40.2	39.4
Incr Delay (d2), s/veh	12.7	3.5	3.7	10.9	3.2	3.4	0.2	0.8	2.5	0.2	5.3	7.6
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	3.0	7.0	7.1	2.9	6.5	6.6	3.2	3.9	3.6	2.2	3.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.4	43.8	44.1	55.3	40.1	40.5	30.1	44.7	46.8	21.7	45.5	47.0
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	D	D
Approach Vol, veh/h	673			689			609			554		
Approach Delay, s/veh	46.2			42.7			41.6			39.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	41.5	20.1	13.0	25.3	43.3	18.3	13.0	25.4				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	13.3	27.8	10.1	29.2	11.8	29.3	8.8	30.5				
Max Q Clear Time (g_c+l1), s	8.2	11.7	8.5	17.5	10.1	10.2	8.3	17.4				
Green Ext Time (p_c), s	0.2	1.6	0.0	1.6	0.1	1.5	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	42.6											
HCM 6th LOS	D											

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	603	132	50	568	7	81	7	57	2	25	15
Future Volume (vph)	15	603	132	50	568	7	81	7	57	2	25	15
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00			0.98			0.99	
Frt			0.850		0.998			0.867			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1587	0	1630	1746	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1407	1630	3531	0	1630	1587	0	1630	1746	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151		1			62			16	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	16	655	143	54	617	8	88	8	62	2	27	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	655	143	54	625	0	88	70	0	2	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	12.0	45.4	45.4	17.0	50.4		22.0	47.6		10.0	35.6	
Total Split (%)	10.0%	37.8%	37.8%	14.2%	42.0%		18.3%	39.7%		8.3%	29.7%	
Maximum Green (s)	7.1	40.5	40.5	12.1	45.5		17.1	42.7		5.1	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	9.5	20.6	20.6	10.4	25.6		11.9	22.1		7.8	11.7	
Actuated g/C Ratio	0.16	0.34	0.34	0.17	0.42		0.19	0.36		0.13	0.19	
v/c Ratio	0.06	0.55	0.25	0.19	0.42		0.28	0.11		0.01	0.12	
Control Delay (s/veh)	34.9	22.0	5.5	34.4	16.9		32.8	7.0		40.0	20.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	34.9	22.0	5.5	34.4	16.9		32.8	7.0		40.0	20.5	
LOS	C	C	A	C	B		C	A		D	C	
Approach Delay (s/veh)		19.4			18.3			21.4			21.4	
Approach LOS		B			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 61.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay (s/veh): 19.2

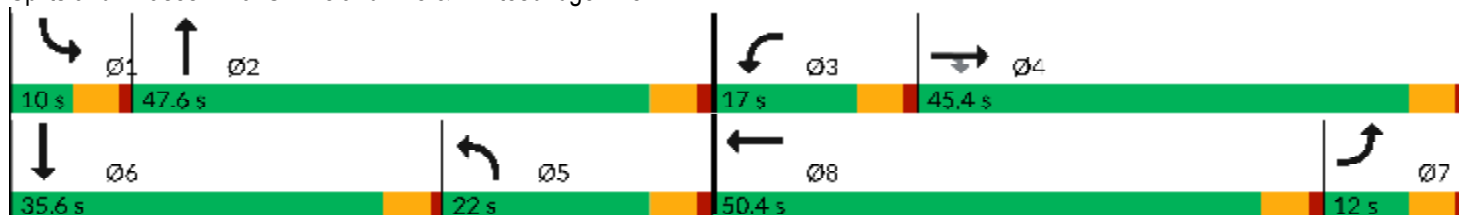
Intersection LOS: B

Intersection Capacity Utilization 43.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

PM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	603	132	50	568	7	81	7	57	2	25	15
Future Volume (veh/h)	15	603	132	50	568	7	81	7	57	2	25	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	16	655	143	54	617	8	88	8	62	2	27	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	152	1134	452	107	1048	14	144	39	303	38	165	98
Arrive On Green	0.09	0.32	0.32	0.07	0.29	0.27	0.09	0.22	0.19	0.02	0.15	0.13
Sat Flow, veh/h	1641	3554	1416	1641	3590	47	1641	181	1401	1641	1088	645
Grp Volume(v), veh/h	16	655	143	54	305	320	88	0	70	2	0	43
Grp Sat Flow(s),veh/h/ln	1641	1777	1416	1641	1777	1860	1641	0	1581	1641	0	1733
Q Serve(g_s), s	0.4	6.5	1.7	1.4	6.2	6.3	2.2	0.0	1.6	0.1	0.0	0.9
Cycle Q Clear(g_c), s	0.4	6.5	1.7	1.4	6.2	6.3	2.2	0.0	1.6	0.1	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.89	1.00		0.37
Lane Grp Cap(c), veh/h	152	1134	452	107	519	543	144	0	342	38	0	263
V/C Ratio(X)	0.11	0.58	0.32	0.50	0.59	0.59	0.61	0.00	0.20	0.05	0.00	0.16
Avail Cap(c_a), veh/h	309	3458	1378	501	1938	2029	694	0	1621	231	0	1288
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	17.7	12.1	3.1	19.2	12.9	12.9	18.7	0.0	14.0	20.3	0.0	15.8
Incr Delay (d2), s/veh	0.3	0.5	0.4	3.6	1.1	1.0	4.2	0.0	0.3	0.6	0.0	0.3
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	0.1	1.7	0.6	0.5	1.8	1.8	0.8	0.0	0.4	0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.0	12.6	3.5	22.8	13.9	13.9	22.9	0.0	14.3	20.9	0.0	16.1
LnGrp LOS	B	B	A	C	B	B	C		B	C		B
Approach Vol, veh/h	814			679			158			45		
Approach Delay, s/veh	11.1			14.6			19.1			16.3		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	13.2	6.8	17.6	7.7	10.5	7.9	16.4				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	5.1	42.7	12.1	40.5	17.1	30.7	7.1	45.5				
Max Q Clear Time (g_c+l1), s	2.1	3.6	3.4	8.5	4.2	2.9	2.4	8.3				
Green Ext Time (p_c), s	0.0	0.2	0.1	3.5	0.2	0.1	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	13.4											
HCM 6th LOS	B											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	156	16	31	222	19	12	46	16	28	40	63
Future Volume (vph)	35	156	16	31	222	19	12	46	16	28	40	63
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.962			0.908	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3405	0	1630	3214	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3405	0	1630	3214	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	38	170	17	34	241	21	13	50	17	30	43	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	170	17	34	241	21	13	67	0	30	111	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	34.4%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection

Intersection Delay, s/veh 10.5

Intersection LOS B

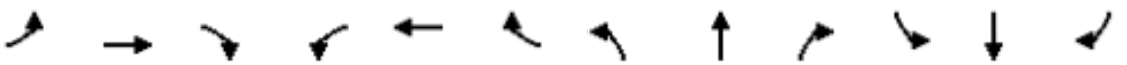
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	156	16	31	222	19	12	46	16	28	40	63
Future Vol, veh/h	35	156	16	31	222	19	12	46	16	28	40	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	170	17	34	241	21	13	50	17	30	43	68
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	10.5	11.4	9.4	9.4
HCM LOS	B	B	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	49%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	51%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	31	31	35	156	16	31	222	19	28	27
LT Vol	12	0	0	35	0	0	31	0	0	28	0
Through Vol	0	31	15	0	156	0	0	222	0	0	27
RT Vol	0	0	16	0	0	16	0	0	19	0	0
Lane Flow Rate	13	33	34	38	170	17	34	241	21	30	29
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.025	0.059	0.057	0.067	0.277	0.025	0.058	0.385	0.029	0.057	0.05
Departure Headway (Hd)	6.856	6.356	5.998	6.382	5.882	5.182	6.241	5.741	5.041	6.727	6.227
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	523	564	597	562	612	691	575	627	711	533	576
Service Time	4.588	4.088	3.73	4.109	3.609	2.909	3.967	3.467	2.767	4.458	3.958
HCM Lane V/C Ratio	0.025	0.059	0.057	0.068	0.278	0.025	0.059	0.384	0.03	0.056	0.05
HCM Control Delay, s/veh	9.8	9.5	9.1	9.6	10.9	8	9.4	12	7.9	9.9	9.3
HCM Lane LOS	A	A	A	A	B	A	A	B	A	A	A
HCM 95th-tile Q	0.1	0.2	0.2	0.2	1.1	0.1	0.2	1.8	0.1	0.2	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	165	62	72	134	59	45	485	47	72	348	47
Future Volume (vph)	53	165	62	72	134	59	45	485	47	72	348	47
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.987			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3483	0	1630	3467	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1431	1630	3483	0	1630	3467	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		10			16	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	58	179	67	78	146	64	49	527	51	78	378	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	179	67	78	146	64	49	578	0	78	429	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	15.0	34.0	34.0	16.0	35.0	35.0	13.0	34.0		16.0	37.0	
Total Split (%)	15.0%	34.0%	34.0%	16.0%	35.0%	35.0%	13.0%	34.0%		16.0%	37.0%	
Maximum Green (s)	10.1	29.1	29.1	11.1	30.1	30.1	8.1	29.1		11.1	32.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	11.3	17.6	17.6	10.4	16.5	16.5	8.7	49.7		10.7	51.7	
Actuated g/C Ratio	0.11	0.18	0.18	0.10	0.17	0.17	0.09	0.50		0.11	0.52	
v/c Ratio	0.32	0.55	0.17	0.46	0.48	0.17	0.35	0.33		0.45	0.24	
Control Delay (s/veh)	44.6	42.5	0.9	50.7	41.3	0.9	49.7	19.9		30.6	7.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	44.6	42.5	0.9	50.7	41.3	0.9	49.7	19.9		30.6	7.6	
LOS	D	D	A	D	D	A	D	B		C	A	
Approach Delay (s/veh)		33.8			34.9			22.2			11.2	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 6 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay (s/veh): 23.1

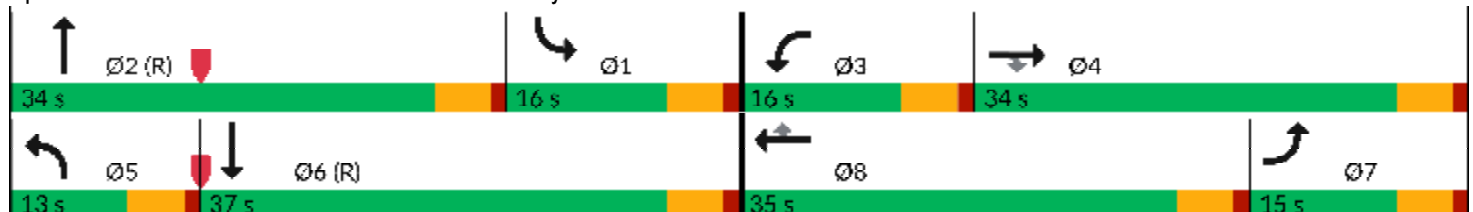
Intersection LOS: C

Intersection Capacity Utilization 51.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

PM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	165	62	72	134	59	45	485	47	72	348	47
Future Volume (veh/h)	53	165	62	72	134	59	45	485	47	72	348	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	58	179	67	78	146	64	49	527	51	78	378	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	270	206	112	251	191	75	665	64	695	1827	245
Arrive On Green	0.08	0.14	0.14	0.07	0.13	0.13	0.05	0.20	0.19	0.85	1.00	1.00
Sat Flow, veh/h	1641	1870	1423	1641	1870	1422	1641	3262	315	1641	3143	421
Grp Volume(v), veh/h	58	179	67	78	146	64	49	286	292	78	212	217
Grp Sat Flow(s),veh/h/ln	1641	1870	1423	1641	1870	1422	1641	1777	1800	1641	1777	1787
Q Serve(g_s), s	3.4	9.1	4.2	4.6	7.3	4.1	2.9	15.3	15.4	0.8	0.0	0.0
Cycle Q Clear(g_c), s	3.4	9.1	4.2	4.6	7.3	4.1	2.9	15.3	15.4	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.24
Lane Grp Cap(c), veh/h	129	270	206	112	251	191	75	362	367	695	1033	1039
V/C Ratio(X)	0.45	0.66	0.33	0.69	0.58	0.34	0.65	0.79	0.80	0.11	0.21	0.21
Avail Cap(c_a), veh/h	180	561	427	197	580	441	148	533	540	695	1033	1039
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	44.0	40.5	38.4	45.6	40.7	39.2	46.9	37.8	37.9	4.5	0.0	0.0
Incr Delay (d2), s/veh	2.4	2.8	0.9	7.5	2.1	1.0	9.1	16.0	16.2	0.1	0.4	0.4
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	1.4	4.1	1.4	2.0	3.3	1.4	1.3	7.8	8.0	0.3	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.4	43.3	39.3	53.0	42.8	40.3	56.0	53.8	54.1	4.5	0.4	0.4
LnGrp LOS	D	D	D	D	D	D	E	D	D	A	A	A
Approach Vol, veh/h	304			288			627			507		
Approach Delay, s/veh	43.0			45.0			54.2			1.1		
Approach LOS	D			D			D			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	46.3	24.4	10.8	18.4	8.6	62.1	11.9	17.4				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	11.1	29.1	11.1	29.1	8.1	32.1	10.1	30.1				
Max Q Clear Time (g_c+I1), s	2.8	17.4	6.6	11.1	4.9	2.0	5.4	9.3				
Green Ext Time (p_c), s	0.1	1.7	0.1	0.7	0.0	1.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	35.1											
HCM 6th LOS	D											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

PM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	69	19	24	78	42	24	195	28	38	133	54
Future Volume (vph)	43	69	19	24	78	42	24	195	28	38	133	54
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.960			0.985			0.957	
Flt Protected		0.984			0.992			0.995		0.950		
Satd. Flow (prot)	0	1796	0	0	1774	0	0	1826	0	1630	1783	0
Flt Permitted		0.984			0.992			0.995		0.950		
Satd. Flow (perm)	0	1796	0	0	1774	0	0	1826	0	1630	1783	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	47	75	21	26	85	46	26	212	30	41	145	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	143	0	0	157	0	0	268	0	41	204	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	47.3%											
Analysis Period (min)	15											
ICU Level of Service A												

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	43	69	19	24	78	42	24	195	28	38	133	54
Future Vol, veh/h	43	69	19	24	78	42	24	195	28	38	133	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	75	21	26	85	46	26	212	30	41	145	59
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	10.1	10.1	11.5	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	10%	33%	17%	100%	0%
Vol Thru, %	79%	53%	54%	0%	71%
Vol Right, %	11%	15%	29%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	247	131	144	38	187
LT Vol	24	43	24	38	0
Through Vol	195	69	78	0	133
RT Vol	28	19	42	0	54
Lane Flow Rate	268	142	157	41	203
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.388	0.219	0.235	0.071	0.311
Departure Headway (Hd)	5.202	5.541	5.399	6.211	5.501
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	693	648	665	577	654
Service Time	3.233	3.577	3.434	3.941	3.231
HCM Lane V/C Ratio	0.387	0.219	0.236	0.071	0.31
HCM Control Delay, s/veh	11.5	10.1	10.1	9.4	10.7
HCM Lane LOS	B	B	B	A	B
HCM 95th-tile Q	1.8	0.8	0.9	0.2	1.3

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	5	3	2	5	0	1	27	1	1	54	3
Future Volume (vph)	1	5	3	2	5	0	1	27	1	1	54	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955						0.996			0.994	
Flt Protected		0.994			0.986			0.998			0.999	
Satd. Flow (prot)	0	1768	0	0	1837	0	0	1852	0	0	1850	0
Flt Permitted		0.994			0.986			0.998			0.999	
Satd. Flow (perm)	0	1768	0	0	1837	0	0	1852	0	0	1850	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		588			2659			1363			540	
Travel Time (s)		7.3			33.0			16.9			6.7	
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
Adj. Flow (vph)	1	5	3	2	5	0	1	29	1	1	59	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	7	0	0	31	0	0	63	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 13.4%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	5	3	2	5	0	1	27	1	1	54	3
Future Vol, veh/h	1	5	3	2	5	0	1	27	1	1	54	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	5	3	2	5	0	1	29	1	1	59	3
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, s/veh	7	7.2	7.2	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	11%	29%	2%
Vol Thru, %	93%	56%	71%	93%
Vol Right, %	3%	33%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	9	7	58
LT Vol	1	1	2	1
Through Vol	27	5	5	54
RT Vol	1	3	0	3
Lane Flow Rate	32	10	8	63
Geometry Grp	1	1	1	1
Degree of Util (X)	0.035	0.011	0.009	0.069
Departure Headway (Hd)	3.999	3.926	4.163	3.961
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	897	908	857	907
Service Time	2.017	1.966	2.203	1.975
HCM Lane V/C Ratio	0.036	0.011	0.009	0.069
HCM Control Delay, s/veh	7.2	7	7.2	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	3	5	15	4	1	2	29	6	0	48	2
Future Volume (vph)	1	3	5	15	4	1	2	29	6	0	48	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.925			0.994			0.977			0.995	
Flt Protected		0.994			0.963			0.998				
Satd. Flow (prot)	0	1713	0	0	1783	0	0	1816	0	0	1853	0
Flt Permitted		0.994			0.963			0.998				
Satd. Flow (perm)	0	1713	0	0	1783	0	0	1816	0	0	1853	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2659			2643			2647			315	
Travel Time (s)		33.0			32.8			32.8			3.9	
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
Adj. Flow (vph)	1	3	5	16	4	1	2	32	7	0	52	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	21	0	0	41	0	0	54	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 15.0%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection

Int Delay, s/veh 8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	5	15	4	1	2	29	6	0	48	2
Future Vol, veh/h	1	3	5	15	4	1	2	29	6	0	48	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	-	-	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	3	5	16	4	1	2	32	7	0	52	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	5	0	0	8	0	0	72	45	6	64	47	5
Stage 1	-	-	-	-	-	-	8	8	-	37	37	-
Stage 2	-	-	-	-	-	-	64	37	-	27	10	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1616	-	-	1612	-	-	919	847	1077	930	845	1078
Stage 1	-	-	-	-	-	-	1013	889	-	978	864	-
Stage 2	-	-	-	-	-	-	947	864	-	990	887	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1616	-	-	1612	-	-	866	838	1077	890	836	1078
Mov Cap-2 Maneuver	-	-	-	-	-	-	866	838	-	890	836	-
Stage 1	-	-	-	-	-	-	1012	888	-	977	855	-
Stage 2	-	-	-	-	-	-	879	855	-	948	886	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.8			5.4			9.3			9.6		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	871	1616	-	-	1612	-	-	844
HCM Lane V/C Ratio	0.046	0.001	-	-	0.01	-	-	0.064
HCM Control Delay (s/veh)	9.3	7.2	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q (veh)	0.1	0	-	-	0	-	-	0.2



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	3	4	389	385	9
Future Volume (vph)	5	3	4	389	385	9
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.997	
Flt Protected	0.970					
Satd. Flow (prot)	1579	0	0	1863	1857	0
Flt Permitted	0.970					
Satd. Flow (perm)	1579	0	0	1863	1857	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	3	4	423	418	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	427	428	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 33.7%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	3	4	389	385	9
Future Vol, veh/h	5	3	4	389	385	9
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	5	3	4	423	418	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	854	423	428
Stage 1	423	-	-
Stage 2	431	-	-
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	329	631	1131
Stage 1	661	-	-
Stage 2	655	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	327	631	1131
Mov Cap-2 Maneuver	327	-	-
Stage 1	658	-	-
Stage 2	655	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	14.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1131	-	399	-	-
HCM Lane V/C Ratio	0.004	-	0.022	-	-
HCM Control Delay (s/veh)	8.2	0	14.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q (veh)	0	-	0.1	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Existing+Project

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	512	56	140	553	88	70	54	140	77	66	3
Future Volume (vph)	5	512	56	140	553	88	70	54	140	77	66	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.979			0.892			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3449	0	1630	1640	0	1630	1850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3449	0	1630	1640	0	1630	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128		20			141			2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	5	557	61	152	601	96	76	59	152	84	72	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	557	61	152	697	0	76	211	0	84	75	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	30.6	30.6	18.0	39.7		14.4	38.4		13.0	37.0	
Total Split (%)	8.9%	30.6%	30.6%	18.0%	39.7%		14.4%	38.4%		13.0%	37.0%	
Maximum Green (s)	4.0	25.7	25.7	13.1	34.8		9.5	33.5		8.1	32.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	4.9	47.0	47.0	14.2	63.5		10.9	14.8		10.2	14.1	
Actuated g/C Ratio	0.05	0.47	0.47	0.14	0.64		0.11	0.15		0.10	0.14	
v/c Ratio	0.06	0.33	0.08	0.66	0.32		0.43	0.58		0.51	0.29	
Control Delay (s/veh)	47.2	21.1	0.2	36.8	9.4		49.0	19.1		54.0	37.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	47.2	21.1	0.2	36.8	9.4		49.0	19.1		54.0	37.2	
LOS	D	C	A	D	A		D	B		D	D	
Approach Delay (s/veh)		19.2			14.3			27.0			46.0	
Approach LOS		B			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 19 (19%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay (s/veh): 20.4

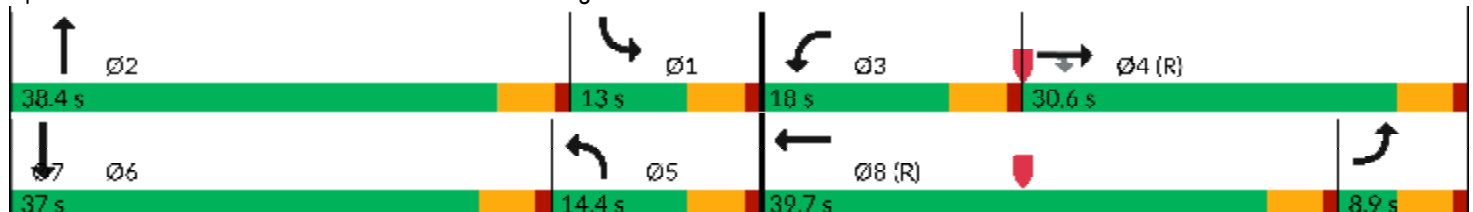
Intersection LOS: C

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

PM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	512	56	140	553	88	70	54	140	77	66	3
Future Volume (veh/h)	5	512	56	140	553	88	70	54	140	77	66	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	5	557	61	152	601	96	76	59	152	84	72	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	374	1652	668	197	1091	174	249	83	214	119	184	8
Arrive On Green	0.23	0.46	0.46	0.04	0.12	0.11	0.15	0.18	0.17	0.07	0.10	0.09
Sat Flow, veh/h	1641	3554	1436	1641	3056	487	1641	455	1172	1641	1780	74
Grp Volume(v), veh/h	5	557	61	152	349	348	76	0	211	84	0	75
Grp Sat Flow(s),veh/h/ln	1641	1777	1436	1641	1777	1765	1641	0	1627	1641	0	1854
Q Serve(g_s), s	0.2	9.9	1.3	9.2	18.5	18.6	4.1	0.0	12.2	5.0	0.0	3.8
Cycle Q Clear(g_c), s	0.2	9.9	1.3	9.2	18.5	18.6	4.1	0.0	12.2	5.0	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.28	1.00		0.72	1.00		0.04
Lane Grp Cap(c), veh/h	374	1652	668	197	634	630	249	0	297	119	0	191
V/C Ratio(X)	0.01	0.34	0.09	0.77	0.55	0.55	0.30	0.00	0.71	0.71	0.00	0.39
Avail Cap(c_a), veh/h	374	1652	668	230	634	630	249	0	560	148	0	612
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.9	17.0	4.2	46.7	36.5	36.6	37.7	0.0	38.7	45.3	0.0	41.9
Incr Delay (d2), s/veh	0.0	0.6	0.3	9.0	2.3	2.3	0.7	0.0	3.1	10.9	0.0	1.3
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	0.1	3.7	0.7	4.3	9.1	9.0	1.6	0.0	4.8	2.3	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.9	17.5	4.5	55.7	38.8	38.9	38.4	0.0	41.8	56.3	0.0	43.2
LnGrp LOS	C	B	A	E	D	D	D		D	E		D
Approach Vol, veh/h		623			849			287			159	
Approach Delay, s/veh		16.4			41.9			40.9			50.1	
Approach LOS		B			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.2	22.3	16.0	50.5	19.2	14.3	26.8	39.7				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	8.1	33.5	13.1	25.7	9.5	32.1	4.0	34.8				
Max Q Clear Time (g_c+I1), s	7.0	14.2	11.2	11.9	6.1	5.8	2.2	20.6				
Green Ext Time (p_c), s	0.0	0.7	0.1	2.2	0.0	0.2	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			34.1									
HCM 6th LOS			C									

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	533	121	100	575	59	198	294	130	137	284	88
Future Volume (vph)	97	533	121	100	575	59	198	294	130	137	284	88
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.972			0.986				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3428	0	1630	3480	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3428	0	1630	3480	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			11				141			128
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	105	579	132	109	625	64	215	320	141	149	309	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	711	0	109	689	0	215	320	141	149	309	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	13.7	34.1		14.0	34.4		21.4	34.4	34.4	17.5	30.5	30.5
Total Split (%)	13.7%	34.1%		14.0%	34.4%		21.4%	34.4%	34.4%	17.5%	30.5%	30.5%
Maximum Green (s)	8.8	29.2		9.1	29.5		16.5	29.5	29.5	12.6	25.6	25.6
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	11.4	26.0		11.6	26.3		18.6	20.5	20.5	25.8	27.8	27.8
Actuated g/C Ratio	0.11	0.26		0.12	0.26		0.19	0.21	0.21	0.26	0.28	0.28
v/c Ratio	0.57	0.78		0.58	0.75		0.71	0.44	0.35	0.35	0.31	0.20
Control Delay (s/veh)	56.9	30.7		47.2	35.6		35.6	20.8	4.9	38.4	31.4	3.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	56.9	30.7		47.2	35.6		35.6	20.8	4.9	38.4	31.4	3.4
LOS	E	C		D	D		D	C	A	D	C	A
Approach Delay (s/veh)		34.0			37.2			22.2			28.4	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay (s/veh): 31.0

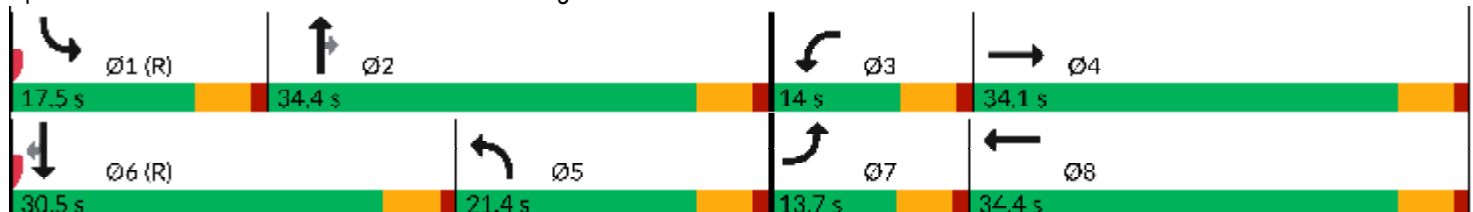
Intersection LOS: C

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

PM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	533	121	100	575	59	198	294	130	137	284	88
Future Volume (veh/h)	97	533	121	100	575	59	198	294	130	137	284	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	105	579	132	109	625	64	215	320	141	149	309	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	723	164	149	828	85	581	658	264	511	506	203
Arrive On Green	0.03	0.08	0.08	0.03	0.08	0.08	0.24	0.12	0.12	0.31	0.14	0.14
Sat Flow, veh/h	1641	2864	651	1641	3243	331	1641	3554	1427	1641	3554	1423
Grp Volume(v), veh/h	105	359	352	109	342	347	215	320	141	149	309	96
Grp Sat Flow(s),veh/h/ln	1641	1777	1738	1641	1777	1797	1641	1777	1427	1641	1777	1423
Q Serve(g_s), s	6.3	19.8	19.9	6.6	18.8	18.9	11.0	8.4	9.3	6.9	8.2	4.9
Cycle Q Clear(g_c), s	6.3	19.8	19.9	6.6	18.8	18.9	11.0	8.4	9.3	6.9	8.2	4.9
Prop In Lane	1.00		0.37	1.00		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	449	439	149	454	459	581	658	264	511	506	203
V/C Ratio(X)	0.73	0.80	0.80	0.73	0.75	0.76	0.37	0.49	0.53	0.29	0.61	0.47
Avail Cap(c_a), veh/h	159	535	523	164	540	546	581	1080	434	511	942	377
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.93	0.93	0.93	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	43.3	43.4	47.3	42.7	42.8	28.8	39.4	39.7	26.1	40.3	24.2
Incr Delay (d2), s/veh	13.1	6.7	7.1	13.1	4.6	4.6	0.4	0.5	1.6	0.3	5.4	7.7
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	3.1	10.1	10.0	3.2	9.4	9.5	4.2	3.6	3.3	2.5	3.7	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	60.5	50.1	50.5	60.4	47.3	47.4	29.2	39.9	41.3	26.4	45.7	31.9
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	D	C
Approach Vol, veh/h	816			798			676			554		
Approach Delay, s/veh	51.6			49.1			36.8			38.1		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.1	22.5	13.1	29.3	39.4	18.2	12.8	29.5				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	12.6	29.5	9.1	29.2	16.5	25.6	8.8	29.5				
Max Q Clear Time (g_c+I1), s	8.9	11.3	8.6	21.9	13.0	10.2	8.3	20.9				
Green Ext Time (p_c), s	0.1	1.7	0.0	1.7	0.2	1.4	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	44.8											
HCM 6th LOS	D											

Lanes, Volumes, Timings
6: S Vineland Ave & Whitesbridge Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	635	176	50	605	7	136	7	57	2	25	15
Future Volume (vph)	15	635	176	50	605	7	136	7	57	2	25	15
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00			0.98			0.99	
Frt			0.850		0.998			0.867			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1589	0	1630	1747	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1409	1630	3531	0	1630	1589	0	1630	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			191		1			62			16	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	16	690	191	54	658	8	148	8	62	2	27	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	690	191	54	666	0	148	70	0	2	43	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
6: S Vineland Ave & Whitesbridge Ave

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	8.9	32.4	32.4	12.0	35.5		20.0	46.7		8.9	35.6	
Total Split (%)	8.9%	32.4%	32.4%	12.0%	35.5%		20.0%	46.7%		8.9%	35.6%	
Maximum Green (s)	4.0	27.5	27.5	7.1	30.6		15.1	41.8		4.0	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.6	52.1	52.1	7.7	57.5		13.9	28.5		4.9	12.3	
Actuated g/C Ratio	0.07	0.52	0.52	0.08	0.58		0.14	0.29		0.05	0.12	
v/c Ratio	0.15	0.37	0.23	0.43	0.33		0.65	0.14		0.03	0.19	
Control Delay (s/veh)	61.3	11.2	1.7	55.1	15.1		54.3	7.2		46.0	25.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	61.3	11.2	1.7	55.1	15.1		54.3	7.2		46.0	25.9	
LOS	E	B	A	E	B		D	A		D	C	
Approach Delay (s/veh)		10.0			18.1			39.2			26.8	
Approach LOS		B			B			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 98 (98%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay (s/veh): 16.9

Intersection LOS: B

Intersection Capacity Utilization 52.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

PM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	635	176	50	605	7	136	7	57	2	25	15
Future Volume (veh/h)	15	635	176	50	605	7	136	7	57	2	25	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.96
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	16	690	191	54	658	8	148	8	62	2	27	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	38	1009	402	577	2201	27	191	35	271	18	95	57
Arrive On Green	0.05	0.57	0.57	0.35	0.61	0.60	0.12	0.19	0.18	0.01	0.09	0.08
Sat Flow, veh/h	1641	3554	1414	1641	3594	44	1641	181	1400	1641	1084	642
Grp Volume(v), veh/h	16	690	191	54	325	341	148	0	70	2	0	43
Grp Sat Flow(s),veh/h/ln	1641	1777	1414	1641	1777	1861	1641	0	1581	1641	0	1726
Q Serve(g_s), s	0.9	13.7	5.6	2.2	8.7	8.7	8.8	0.0	3.8	0.1	0.0	2.3
Cycle Q Clear(g_c), s	0.9	13.7	5.6	2.2	8.7	8.7	8.8	0.0	3.8	0.1	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.89	1.00		0.37
Lane Grp Cap(c), veh/h	38	1009	402	577	1088	1139	191	0	305	18	0	152
V/C Ratio(X)	0.42	0.68	0.48	0.09	0.30	0.30	0.78	0.00	0.23	0.11	0.00	0.28
Avail Cap(c_a), veh/h	80	1009	402	577	1088	1139	263	0	675	80	0	546
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	18.4	8.4	21.7	9.2	9.2	42.9	0.0	34.4	48.9	0.0	42.8
Incr Delay (d2), s/veh	5.1	2.7	2.9	0.1	0.7	0.7	9.4	0.0	0.4	2.6	0.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.1	2.2	0.8	2.9	3.0	3.8	0.0	1.4	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.1	21.1	11.3	21.8	9.9	9.9	52.3	0.0	34.8	51.5	0.0	43.8
LnGrp LOS	D	C	B	C	A	A	D		C	D		D
Approach Vol, veh/h	897			720			218			45		
Approach Delay, s/veh	19.6			10.8			46.7			44.2		
Approach LOS	B			B			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.1	23.3	39.2	32.4	15.6	12.8	6.3	65.2				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	41.8	7.1	27.5	15.1	30.7	4.0	30.6				
Max Q Clear Time (g_c+I1), s	2.1	5.8	4.2	15.7	10.8	4.3	2.9	10.7				
Green Ext Time (p_c), s	0.0	0.2	0.0	3.1	0.2	0.1	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	19.9											
HCM 6th LOS	B											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	156	16	31	222	62	12	62	16	64	53	68
Future Volume (vph)	41	156	16	31	222	62	12	62	16	64	53	68
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.970			0.916	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3433	0	1630	3242	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3433	0	1630	3242	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	45	170	17	34	241	67	13	67	17	70	58	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	170	17	34	241	67	13	84	0	70	132	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	36.5%						ICU Level of Service A					
Analysis Period (min)	15											

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	41	156	16	31	222	62	12	62	16	64	53	68
Future Vol, veh/h	41	156	16	31	222	62	12	62	16	64	53	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	45	170	17	34	241	67	13	67	17	70	58	74
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	11.1	11.7	9.9	10.1
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	56%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	44%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	41	37	41	156	16	31	222	62	64	35
LT Vol	12	0	0	41	0	0	31	0	0	64	0
Through Vol	0	41	21	0	156	0	0	222	0	0	35
RT Vol	0	0	16	0	0	16	0	0	62	0	0
Lane Flow Rate	13	45	40	45	170	17	34	241	67	70	38
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.026	0.083	0.071	0.083	0.294	0.027	0.061	0.405	0.1	0.134	0.069
Departure Headway (Hd)	7.175	6.675	6.369	6.741	6.241	5.541	6.537	6.037	5.337	6.948	6.448
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	499	536	562	531	575	645	548	596	671	515	555
Service Time	4.925	4.425	4.119	4.484	3.984	3.284	4.276	3.776	3.076	4.694	4.194
HCM Lane V/C Ratio	0.026	0.084	0.071	0.085	0.296	0.026	0.062	0.404	0.1	0.136	0.068
HCM Control Delay, s/veh	10.1	10	9.6	10.1	11.6	8.4	9.7	12.8	8.7	10.8	9.7
HCM Lane LOS	B	A	A	B	B	A	A	B	A	B	A
HCM 95th-tile Q	0.1	0.3	0.2	0.3	1.2	0.1	0.2	2	0.3	0.5	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	195	63	72	170	70	46	517	47	80	374	47
Future Volume (vph)	53	195	63	72	170	70	46	517	47	80	374	47
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.988			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3487	0	1630	3471	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1431	1630	3487	0	1630	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		10			15	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	58	212	68	78	185	76	50	562	51	87	407	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	212	68	78	185	76	50	613	0	87	458	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	14.0	33.0	33.0	16.0	35.0	35.0	12.0	35.0		16.0	39.0	
Total Split (%)	14.0%	33.0%	33.0%	16.0%	35.0%	35.0%	12.0%	35.0%		16.0%	39.0%	
Maximum Green (s)	9.1	28.1	28.1	11.1	30.1	30.1	7.1	30.1		11.1	34.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	10.9	18.7	18.7	10.4	18.1	18.1	8.5	48.3		11.1	50.8	
Actuated g/C Ratio	0.11	0.19	0.19	0.10	0.18	0.18	0.09	0.48		0.11	0.51	
v/c Ratio	0.33	0.61	0.16	0.46	0.55	0.19	0.36	0.36		0.48	0.26	
Control Delay (s/veh)	45.7	43.9	0.9	50.7	42.2	1.0	50.7	20.8		34.9	10.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.7	43.9	0.9	50.7	42.2	1.0	50.7	20.8		34.9	10.1	
LOS	D	D	A	D	D	A	D	C		C	B	
Approach Delay (s/veh)		35.5			34.9			23.1			14.0	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay (s/veh): 24.8

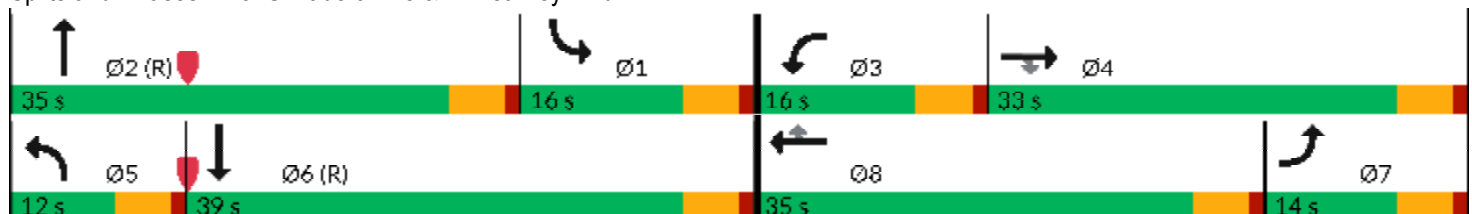
Intersection LOS: C

Intersection Capacity Utilization 52.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

PM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	195	63	72	170	70	46	517	47	80	374	47
Future Volume (veh/h)	53	195	63	72	170	70	46	517	47	80	374	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.96	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	58	212	68	78	185	76	50	562	51	87	407	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	299	228	112	286	217	76	698	63	655	1794	223
Arrive On Green	0.08	0.16	0.16	0.07	0.15	0.15	0.05	0.21	0.20	0.27	0.38	0.37
Sat Flow, veh/h	1641	1870	1425	1641	1870	1424	1641	3284	297	1641	3174	395
Grp Volume(v), veh/h	58	212	68	78	185	76	50	303	310	87	227	231
Grp Sat Flow(s),veh/h/ln	1641	1870	1425	1641	1870	1424	1641	1777	1804	1641	1777	1792
Q Serve(g_s), s	3.4	10.7	4.2	4.6	9.3	4.8	3.0	16.2	16.3	4.0	8.7	8.8
Cycle Q Clear(g_c), s	3.4	10.7	4.2	4.6	9.3	4.8	3.0	16.2	16.3	4.0	8.7	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		0.22
Lane Grp Cap(c), veh/h	124	299	228	112	286	217	76	378	384	655	1004	1013
V/C Ratio(X)	0.47	0.71	0.30	0.69	0.65	0.35	0.65	0.80	0.81	0.13	0.23	0.23
Avail Cap(c_a), veh/h	164	542	413	197	580	441	131	551	559	655	1004	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	44.3	39.8	37.1	45.6	39.8	37.9	46.9	37.4	37.5	23.5	16.2	16.3
Incr Delay (d2), s/veh	2.7	3.1	0.7	7.5	2.5	1.0	9.1	16.4	16.5	0.1	0.5	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	1.4	4.9	1.4	2.0	4.2	1.6	1.4	8.3	8.4	1.5	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.0	42.9	37.8	53.0	42.3	38.9	55.9	53.8	54.0	23.6	16.7	16.8
LnGrp LOS	D	D	D	D	D	D	E	D	D	C	B	B
Approach Vol, veh/h	338			339			663			545		
Approach Delay, s/veh	42.6			44.0			54.0			17.8		
Approach LOS	D			D			D			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.9	25.3	10.8	20.0	8.7	60.5	11.5	19.3				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	11.1	30.1	11.1	28.1	7.1	34.1	9.1	30.1				
Max Q Clear Time (g_c+I1), s	6.0	18.3	6.6	12.7	5.0	10.8	5.4	11.3				
Green Ext Time (p_c), s	0.1	1.8	0.1	0.8	0.0	1.5	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	39.7											
HCM 6th LOS	D											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

PM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	94	27	24	108	42	35	233	28	38	163	54
Future Volume (vph)	43	94	27	24	108	42	35	233	28	38	163	54
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.967			0.987			0.962	
Flt Protected		0.987			0.993			0.994		0.950		
Satd. Flow (prot)	0	1798	0	0	1789	0	0	1827	0	1630	1792	0
Flt Permitted		0.987			0.993			0.994		0.950		
Satd. Flow (perm)	0	1798	0	0	1789	0	0	1827	0	1630	1792	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	47	102	29	26	117	46	38	253	30	41	177	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	178	0	0	189	0	0	321	0	41	236	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.9%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	94	27	24	108	42	35	233	28	38	163	54
Future Vol, veh/h	43	94	27	24	108	42	35	233	28	38	163	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	102	29	26	117	46	38	253	30	41	177	59
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	11.5	11.5	14.1	12
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	12%	26%	14%	100%	0%
Vol Thru, %	79%	57%	62%	0%	75%
Vol Right, %	9%	16%	24%	0%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	296	164	174	38	217
LT Vol	35	43	24	38	0
Through Vol	233	94	108	0	163
RT Vol	28	27	42	0	54
Lane Flow Rate	322	178	189	41	236
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.498	0.294	0.307	0.076	0.387
Departure Headway (Hd)	5.575	5.928	5.838	6.597	5.912
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	643	603	613	541	606
Service Time	3.636	4	3.908	4.361	3.675
HCM Lane V/C Ratio	0.501	0.295	0.308	0.076	0.389
HCM Control Delay, s/veh	14.1	11.5	11.5	9.9	12.4
HCM Lane LOS	B	B	B	A	B
HCM 95th-tile Q	2.8	1.2	1.3	0.2	1.8

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	3	4	3	4	0	1	30	1	1	60	3
Future Volume (vph)	1	3	4	3	4	0	1	30	1	1	60	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932						0.996			0.994	
Flt Protected		0.994			0.979			0.999			0.999	
Satd. Flow (prot)	0	1726	0	0	1824	0	0	1853	0	0	1850	0
Flt Permitted		0.994			0.979			0.999			0.999	
Satd. Flow (perm)	0	1726	0	0	1824	0	0	1853	0	0	1850	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		588			2659			1363			540	
Travel Time (s)		7.3			33.0			16.9			6.7	
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
Adj. Flow (vph)	1	3	4	3	4	0	1	33	1	1	65	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	7	0	0	35	0	0	69	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 13.8%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection

Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	4	3	4	0	1	30	1	1	60	3
Future Vol, veh/h	1	3	4	3	4	0	1	30	1	1	60	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	4	3	4	0	1	33	1	1	65	3
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, s/veh	6.9	7.3	7.2	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	13%	43%	2%
Vol Thru, %	94%	38%	57%	94%
Vol Right, %	3%	50%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	8	7	64
LT Vol	1	1	3	1
Through Vol	30	3	4	60
RT Vol	1	4	0	3
Lane Flow Rate	35	9	8	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.039	0.009	0.009	0.077
Departure Headway (Hd)	4.003	3.846	4.208	3.964
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	896	925	847	906
Service Time	2.021	1.892	2.253	1.977
HCM Lane V/C Ratio	0.039	0.01	0.009	0.077
HCM Control Delay, s/veh	7.2	6.9	7.3	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	4	3	0	6	1	0	25	1	0	46	2
Future Volume (vph)	1	4	3	0	6	1	0	25	1	0	46	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.983				0.995		0.995	
Flt Protected	0.994											
Satd. Flow (prot)	0	1757	0	0	1831	0	0	1853	0	0	1853	0
Flt Permitted	0.994											
Satd. Flow (perm)	0	1757	0	0	1831	0	0	1853	0	0	1853	0
Link Speed (mph)	55				55				55		55	
Link Distance (ft)	2659				2643				2647		315	
Travel Time (s)	33.0				32.8				32.8		3.9	
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
Adj. Flow (vph)	1	4	3	0	7	1	0	27	1	0	50	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	8	0	0	28	0	0	52	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				12		12	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free				Free				Stop		Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 13.3% ICU Level of Service A												
Analysis Period (min) 15												

Intersection

Int Delay, s/veh 7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	4	3	0	6	1	0	25	1	0	46	2
Future Vol, veh/h	1	4	3	0	6	1	0	25	1	0	46	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	-	-	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	4	3	0	7	1	0	27	1	0	50	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	8	0	0	7	0	0	42	16	6	30	17	8
Stage 1	-	-	-	-	-	-	8	8	-	8	8	-
Stage 2	-	-	-	-	-	-	34	8	-	22	9	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1612	-	-	1614	-	-	961	878	1077	979	877	1074
Stage 1	-	-	-	-	-	-	1013	889	-	1013	889	-
Stage 2	-	-	-	-	-	-	982	889	-	996	888	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1612	-	-	1614	-	-	917	877	1077	955	876	1074
Mov Cap-2 Maneuver	-	-	-	-	-	-	917	877	-	955	876	-
Stage 1	-	-	-	-	-	-	1012	888	-	1012	889	-
Stage 2	-	-	-	-	-	-	925	889	-	964	887	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.9	0	9.2	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	883	1612	-	-	1614	-	-	883
HCM Lane V/C Ratio	0.032	0.001	-	-	-	-	-	0.059
HCM Control Delay (s/veh)	9.2	7.2	0	-	0	-	-	9.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q (veh)	0.1	0	-	-	0	-	-	0.2

Lanes, Volumes, Timings
3: S Madera Ave & Nielsen Ave

PM Future
05/23/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	4	5	485	624	2
Future Volume (vph)	0	4	5	485	624	2
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1484	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1484	0	0	1863	1863	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	4	5	527	678	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	532	680	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.0% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	5	485	624	2
Future Vol, veh/h	0	4	5	485	624	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	0	4	5	527	678	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1216	679	680
Stage 1	679	-	-
Stage 2	537	-	-
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	200	452	912
Stage 1	504	-	-
Stage 2	586	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	198	452	912
Mov Cap-2 Maneuver	198	-	-
Stage 1	500	-	-
Stage 2	586	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	13	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	912	-	452	-	-
HCM Lane V/C Ratio	0.006	-	0.01	-	-
HCM Control Delay (s/veh)	9	0	13	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	659	19	241	815	10	18	20	155	10	39	0
Future Volume (vph)	1	659	19	241	815	10	18	20	155	10	39	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.98				
Frt			0.850		0.998			0.867				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1590	0	1630	1863	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3531	0	1630	1590	0	1630	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181		1			168				
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	1	716	21	262	886	11	20	22	168	11	42	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	716	21	262	897	0	20	190	0	11	42	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	30.7	30.7	22.0	43.8		9.8	38.4		8.9	37.5	
Total Split (%)	8.9%	30.7%	30.7%	22.0%	43.8%		9.8%	38.4%		8.9%	37.5%	
Maximum Green (s)	4.0	25.8	25.8	17.1	38.9		4.9	33.5		4.0	32.6	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	4.9	49.1	49.1	21.3	72.7		7.1	15.8		4.9	13.0	
Actuated g/C Ratio	0.05	0.49	0.49	0.21	0.73		0.07	0.16		0.05	0.13	
v/c Ratio	0.01	0.41	0.03	0.76	0.35		0.17	0.48		0.14	0.17	
Control Delay (s/veh)	46.0	20.6	0.1	32.4	7.8		47.4	10.6		49.7	36.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	46.0	20.6	0.1	32.4	7.8		47.4	10.6		49.7	36.1	
LOS	D	C	A	C	A		D	B		D	D	
Approach Delay (s/veh)		20.1			13.4			14.1			38.9	
Approach LOS		C			B			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 29 (29%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay (s/veh): 16.4

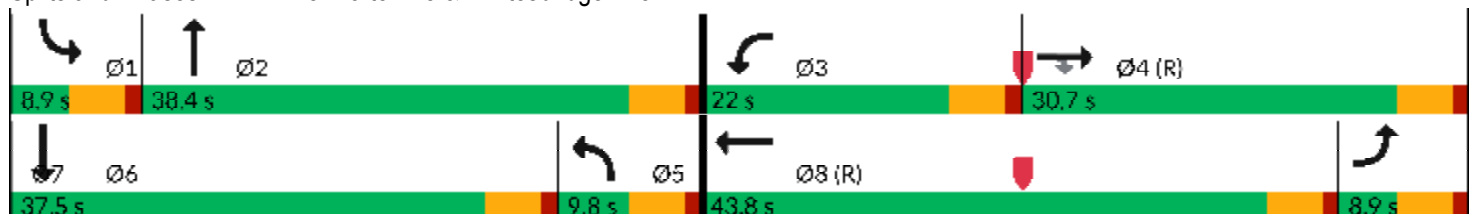
Intersection LOS: B

Intersection Capacity Utilization 59.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	659	19	241	815	10	18	20	155	10	39	0
Future Volume (veh/h)	1	659	19	241	815	10	18	20	155	10	39	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	1	716	21	262	886	11	20	22	168	11	42	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	1656	669	295	1430	18	175	32	244	32	164	0
Arrive On Green	0.25	0.47	0.47	0.06	0.13	0.13	0.11	0.17	0.17	0.02	0.09	0.00
Sat Flow, veh/h	1641	3554	1436	1641	3593	45	1641	183	1396	1641	1870	0
Grp Volume(v), veh/h	1	716	21	262	438	459	20	0	190	11	42	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1436	1641	1777	1861	1641	0	1579	1641	1870	0
Q Serve(g_s), s	0.0	13.5	0.5	15.9	23.3	23.3	1.1	0.0	11.3	0.7	2.1	0.0
Cycle Q Clear(g_c), s	0.0	13.5	0.5	15.9	23.3	23.3	1.1	0.0	11.3	0.7	2.1	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.88	1.00		0.00
Lane Grp Cap(c), veh/h	407	1656	669	295	707	741	175	0	276	32	164	0
V/C Ratio(X)	0.00	0.43	0.03	0.89	0.62	0.62	0.11	0.00	0.69	0.34	0.26	0.00
Avail Cap(c_a), veh/h	407	1656	669	295	707	741	175	0	543	80	627	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.3	17.9	5.5	46.0	36.3	36.3	40.4	0.0	39.1	48.4	42.6	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.1	15.4	2.1	2.0	0.3	0.0	3.1	6.2	0.8	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	0.0	5.1	0.2	8.1	11.3	11.8	0.4	0.0	4.4	0.3	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.3	18.7	5.6	61.5	38.4	38.3	40.7	0.0	42.2	54.6	43.4	0.0
LnGrp LOS	C	B	A	E	D	D	D		D	D	D	
Approach Vol, veh/h		738			1159			210			53	
Approach Delay, s/veh		18.3			43.5			42.0			45.7	
Approach LOS		B			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	21.5	22.0	50.6	14.6	12.8	28.8	43.8				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	33.5	17.1	25.8	4.9	32.6	4.0	38.9				
Max Q Clear Time (g_c+I1), s	2.7	13.3	17.9	15.5	3.1	4.1	2.0	25.3				
Green Ext Time (p_c), s	0.0	0.7	0.0	2.4	0.0	0.1	0.0	2.9				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			34.8									
HCM 6th LOS			C									

Lanes, Volumes, Timings

5: S Madera Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	662	106	172	819	102	166	359	159	167	347	107
Future Volume (vph)	142	662	106	172	819	102	166	359	159	167	347	107
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.979			0.983				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3456	0	1630	3467	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3456	0	1630	3467	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			14				181			181
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	154	720	115	187	890	111	180	390	173	182	377	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	835	0	187	1001	0	180	390	173	182	377	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	14.4	34.1		16.5	36.2		18.0	32.7	32.7	16.7	31.4	31.4
Total Split (%)	14.4%	34.1%		16.5%	36.2%		18.0%	32.7%	32.7%	16.7%	31.4%	31.4%
Maximum Green (s)	9.5	29.2		11.6	31.3		13.1	27.8	27.8	11.8	26.5	26.5
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	14.0	30.5		17.1	33.6		13.9	19.1	19.1	17.3	22.5	22.5
Actuated g/C Ratio	0.14	0.31		0.17	0.34		0.14	0.19	0.19	0.17	0.23	0.23
v/c Ratio	0.68	0.78		0.67	0.85		0.80	0.58	0.41	0.65	0.47	0.25
Control Delay (s/veh)	46.9	25.7		52.6	38.9		69.1	23.1	6.2	53.3	36.3	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	46.9	25.7		52.6	38.9		69.1	23.1	6.2	53.3	36.3	2.1
LOS	D	C		D	D		E	C	A	D	D	A
Approach Delay (s/veh)		29.0			41.0			30.3			35.0	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 16 (16%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay (s/veh): 34.4

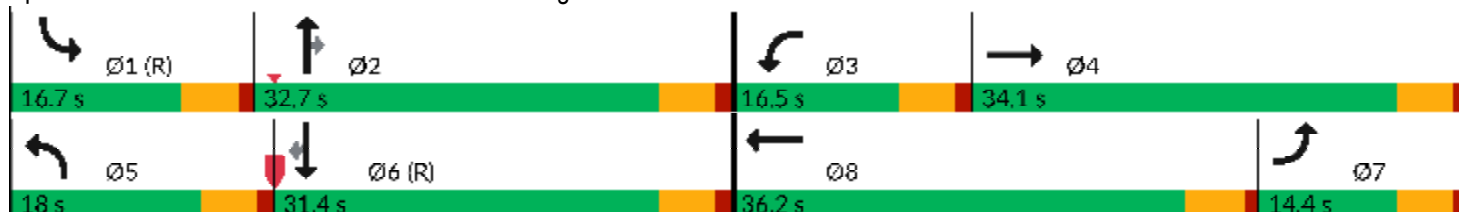
Intersection LOS: C

Intersection Capacity Utilization 78.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

PM Future

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	662	106	172	819	102	166	359	159	167	347	107
Future Volume (veh/h)	142	662	106	172	819	102	166	359	159	167	347	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	154	720	115	187	890	111	180	390	173	182	377	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	171	882	141	205	980	122	225	651	261	399	1029	415
Arrive On Green	0.03	0.10	0.09	0.13	0.31	0.30	0.05	0.06	0.06	0.24	0.29	0.29
Sat Flow, veh/h	1641	3060	488	1641	3166	395	1641	3554	1427	1641	3554	1433
Grp Volume(v), veh/h	154	418	417	187	499	502	180	390	173	182	377	116
Grp Sat Flow(s),veh/h/ln	1641	1777	1771	1641	1777	1785	1641	1777	1427	1641	1777	1433
Q Serve(g_s), s	9.4	23.1	23.1	11.3	27.0	27.0	10.9	10.7	11.9	9.4	8.4	4.5
Cycle Q Clear(g_c), s	9.4	23.1	23.1	11.3	27.0	27.0	10.9	10.7	11.9	9.4	8.4	4.5
Prop In Lane	1.00		0.28	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	171	512	511	205	550	552	225	651	261	399	1029	415
V/C Ratio(X)	0.90	0.82	0.82	0.91	0.91	0.91	0.80	0.60	0.66	0.46	0.37	0.28
Avail Cap(c_a), veh/h	171	535	533	205	572	575	230	1020	410	399	1029	415
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.90	0.90	0.90	0.89	0.89	0.89	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	42.6	42.7	43.2	33.2	33.3	46.4	43.4	43.9	32.2	28.2	14.1
Incr Delay (d2), s/veh	39.9	8.5	8.6	36.6	16.7	16.6	16.1	0.8	2.6	0.8	1.0	1.7
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	5.7	12.0	12.0	6.4	13.1	13.2	5.5	4.9	4.5	3.6	3.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	87.7	51.2	51.3	79.8	49.8	49.9	62.5	44.2	46.5	33.0	29.2	15.7
LnGrp LOS	F	D	D	E	D	D	E	D	D	C	C	B
Approach Vol, veh/h	989		1188				743		675			
Approach Delay, s/veh	56.9		54.6				49.2		27.9			
Approach LOS	E		D				D		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.3	22.3	16.5	32.8	17.7	33.0	14.4	34.9				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	11.8	27.8	11.6	29.2	13.1	26.5	9.5	31.3				
Max Q Clear Time (g_c+I1), s	11.4	13.9	13.3	25.1	12.9	10.4	11.4	29.0				
Green Ext Time (p_c), s	0.0	2.0	0.0	1.4	0.0	1.8	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	49.1											
HCM 6th LOS	D											

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	1039	228	74	844	10	107	9	75	3	33	20
Future Volume (vph)	26	1039	228	74	844	10	107	9	75	3	33	20
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00			0.98			0.99	
Frt			0.850		0.998			0.866			0.943	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1585	0	1630	1744	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1407	1630	3531	0	1630	1585	0	1630	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			248		1			82			22	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	28	1129	248	80	917	11	116	10	82	3	36	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	1129	248	80	928	0	116	92	0	3	58	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	10.6	51.4	51.4	15.0	55.8		18.0	44.7		8.9	35.6	
Total Split (%)	8.8%	42.8%	42.8%	12.5%	46.5%		15.0%	37.3%		7.4%	29.7%	
Maximum Green (s)	5.7	46.5	46.5	10.1	50.9		13.1	39.8		4.0	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.6	69.8	69.8	10.2	75.3		13.5	28.6		5.4	12.9	
Actuated g/C Ratio	0.06	0.58	0.58	0.09	0.63		0.11	0.24		0.05	0.11	
v/c Ratio	0.32	0.55	0.27	0.58	0.42		0.63	0.21		0.04	0.28	
Control Delay (s/veh)	64.3	19.8	3.4	69.8	14.8		66.6	9.3		56.7	33.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	64.3	19.8	3.4	69.8	14.8		66.6	9.3		56.7	33.4	
LOS	E	B	A	E	B		E	A		E	C	
Approach Delay (s/veh)		17.8			19.2			41.2			34.5	
Approach LOS		B			B			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay (s/veh): 20.5

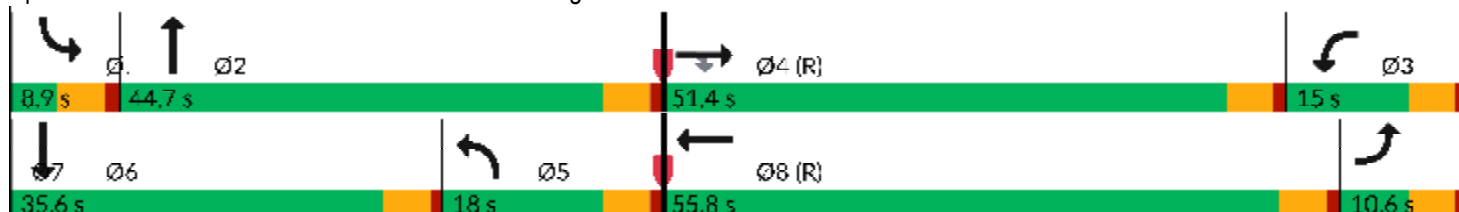
Intersection LOS: C

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

PM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	1039	228	74	844	10	107	9	75	3	33	20
Future Volume (veh/h)	26	1039	228	74	844	10	107	9	75	3	33	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.96
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	28	1129	248	80	917	11	116	10	82	3	36	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	416	1404	560	476	1552	19	151	29	240	18	96	58
Arrive On Green	0.25	0.40	0.40	0.29	0.43	0.42	0.09	0.17	0.16	0.01	0.09	0.08
Sat Flow, veh/h	1641	3554	1419	1641	3595	43	1641	171	1406	1641	1070	654
Grp Volume(v), veh/h	28	1129	248	80	453	475	116	0	92	3	0	58
Grp Sat Flow(s),veh/h/ln	1641	1777	1419	1641	1777	1861	1641	0	1577	1641	0	1724
Q Serve(g_s), s	1.6	33.8	15.4	4.4	23.4	23.4	8.3	0.0	6.2	0.2	0.0	3.8
Cycle Q Clear(g_c), s	1.6	33.8	15.4	4.4	23.4	23.4	8.3	0.0	6.2	0.2	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.89	1.00		0.38
Lane Grp Cap(c), veh/h	416	1404	560	476	767	803	151	0	269	18	0	154
V/C Ratio(X)	0.07	0.80	0.44	0.17	0.59	0.59	0.77	0.00	0.34	0.17	0.00	0.38
Avail Cap(c_a), veh/h	416	1404	560	476	767	803	191	0	535	67	0	454
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)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.0	32.2	26.6	31.8	26.0	26.0	53.2	0.0	44.2	58.8	0.0	51.7
Incr Delay (d2), s/veh	0.0	3.3	1.6	0.2	3.3	3.2	13.4	0.0	0.7	4.5	0.0	1.5
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	0.6	14.0	5.1	1.7	9.8	10.2	3.8	0.0	2.4	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.1	35.4	28.2	31.9	29.3	29.2	66.6	0.0	44.9	63.4	0.0	53.2
LnGrp LOS	C	D	C	C	C	C	E		D	E		D
Approach Vol, veh/h	1405			1008			208			61		
Approach Delay, s/veh	34.1			29.5			57.0			53.7		
Approach LOS	C			C			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	24.5	38.8	51.4	15.0	14.7	34.4	55.8				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	39.8	10.1	46.5	13.1	30.7	5.7	50.9				
Max Q Clear Time (g_c+I1), s	2.2	8.2	6.4	35.8	10.3	5.8	3.6	25.4				
Green Ext Time (p_c), s	0.0	0.3	0.1	4.8	0.1	0.1	0.0	3.6				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	34.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	282	29	46	330	28	15	56	20	34	49	77
Future Volume (vph)	63	282	29	46	330	28	15	56	20	34	49	77
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.960			0.908	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3398	0	1630	3214	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3398	0	1630	3214	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	68	307	32	50	359	30	16	61	22	37	53	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	307	32	50	359	30	16	83	0	37	137	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	43.4%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection

Intersection Delay, s/veh	15.5
Intersection LOS	C

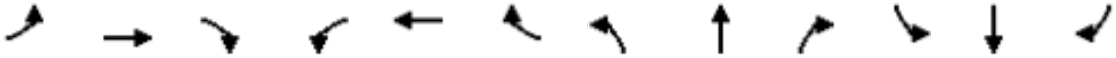
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	282	29	46	330	28	15	56	20	34	49	77
Future Vol, veh/h	63	282	29	46	330	28	15	56	20	34	49	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	307	32	50	359	30	16	61	22	37	53	84
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	15.6	18.3	10.8	11
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	48%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	52%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	37	39	63	282	29	46	330	28	34	33
LT Vol	15	0	0	63	0	0	46	0	0	34	0
Through Vol	0	37	19	0	282	0	0	330	0	0	33
RT Vol	0	0	20	0	0	29	0	0	28	0	0
Lane Flow Rate	16	41	42	68	307	32	50	359	30	37	36
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.036	0.084	0.083	0.134	0.556	0.051	0.097	0.643	0.049	0.08	0.072
Departure Headway (Hd)	7.955	7.455	7.093	7.03	6.53	5.83	6.957	6.457	5.757	7.773	7.273
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	447	477	501	508	549	610	513	556	618	459	490
Service Time	5.751	5.251	4.889	4.803	4.303	3.603	4.727	4.227	3.527	5.56	5.06
HCM Lane V/C Ratio	0.036	0.086	0.084	0.134	0.559	0.052	0.097	0.646	0.049	0.081	0.073
HCM Control Delay, s/veh	11.1	10.9	10.5	10.9	17.3	8.9	10.5	20.2	8.8	11.2	10.6
HCM Lane LOS	B	B	B	B	C	A	B	C	A	B	B
HCM 95th-tile Q	0.1	0.3	0.3	0.5	3.4	0.2	0.3	4.6	0.2	0.3	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	245	92	107	199	88	56	605	59	88	425	57
Future Volume (vph)	79	245	92	107	199	88	56	605	59	88	425	57
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.987			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3483	0	1630	3467	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1431	1630	3483	0	1630	3467	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		10			16	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	86	266	100	116	216	96	61	658	64	96	462	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	266	100	116	216	96	61	722	0	96	524	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	15.2	31.2	31.2	18.2	34.2	34.2	13.8	33.6		17.0	36.8	
Total Split (%)	15.2%	31.2%	31.2%	18.2%	34.2%	34.2%	13.8%	33.6%		17.0%	36.8%	
Maximum Green (s)	10.3	26.3	26.3	13.3	29.3	29.3	8.9	28.7		12.1	31.9	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	13.2	20.4	20.4	12.5	21.9	21.9	15.1	42.1		11.4	38.1	
Actuated g/C Ratio	0.13	0.20	0.20	0.13	0.22	0.22	0.15	0.42		0.11	0.38	
v/c Ratio	0.40	0.70	0.23	0.57	0.53	0.21	0.25	0.49		0.52	0.39	
Control Delay (s/veh)	45.1	46.5	1.2	52.1	39.4	1.1	38.7	25.3		46.5	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.1	46.5	1.2	52.1	39.4	1.1	38.7	25.3		46.5	13.9	
LOS	D	D	A	D	D	A	D	C		D	B	
Approach Delay (s/veh)		36.2			34.3			26.4			19.0	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 78 (78%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay (s/veh): 27.8

Intersection LOS: C

Intersection Capacity Utilization 57.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

PM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	245	92	107	199	88	56	605	59	88	425	57
Future Volume (veh/h)	79	245	92	107	199	88	56	605	59	88	425	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	86	266	100	116	216	96	61	658	64	96	462	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	346	264	156	313	239	593	1557	151	135	621	83
Arrive On Green	0.11	0.19	0.19	0.10	0.17	0.17	0.36	0.48	0.47	0.03	0.07	0.06
Sat Flow, veh/h	1641	1870	1427	1641	1870	1426	1641	3263	317	1641	3141	419
Grp Volume(v), veh/h	86	266	100	116	216	96	61	358	364	96	260	264
Grp Sat Flow(s),veh/h/ln	1641	1870	1427	1641	1870	1426	1641	1777	1803	1641	1777	1784
Q Serve(g_s), s	4.9	13.5	2.7	6.9	10.9	4.7	2.5	13.2	13.3	5.8	14.4	14.5
Cycle Q Clear(g_c), s	4.9	13.5	2.7	6.9	10.9	4.7	2.5	13.2	13.3	5.8	14.4	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.24
Lane Grp Cap(c), veh/h	185	346	264	156	313	239	593	848	860	135	352	353
V/C Ratio(X)	0.46	0.77	0.38	0.74	0.69	0.40	0.10	0.42	0.42	0.71	0.74	0.75
Avail Cap(c_a), veh/h	185	509	388	233	565	431	593	848	860	213	583	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	41.5	38.7	6.8	44.0	39.2	22.8	21.2	17.1	17.2	47.5	44.2	44.3
Incr Delay (d2), s/veh	1.8	4.2	0.9	6.7	2.7	1.1	0.1	1.5	1.5	5.6	11.1	11.4
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	2.0	6.2	2.0	2.9	4.9	2.0	0.9	5.1	5.2	2.5	7.8	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	43.3	42.9	7.7	50.8	41.9	23.9	21.2	18.7	18.7	53.1	55.3	55.7
LnGrp LOS	D	D	A	D	D	C	C	B	B	D	E	E
Approach Vol, veh/h	452			428			783			620		
Approach Delay, s/veh	35.2			40.2			18.9			55.1		
Approach LOS	D			D			B			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	51.7	13.5	22.5	40.2	23.8	15.3	20.8				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	12.1	28.7	13.3	26.3	8.9	31.9	10.3	29.3				
Max Q Clear Time (g_c+I1), s	7.8	15.3	8.9	15.5	4.5	16.5	6.9	12.9				
Green Ext Time (p_c), s	0.1	2.3	0.1	1.0	0.0	1.6	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	36.0											
HCM 6th LOS	D											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

PM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	103	28	43	141	76	29	238	34	50	175	71
Future Volume (vph)	64	103	28	43	141	76	29	238	34	50	175	71
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.960			0.985			0.957	
Flt Protected		0.984			0.992			0.995		0.950		
Satd. Flow (prot)	0	1798	0	0	1774	0	0	1826	0	1630	1783	0
Flt Permitted		0.984			0.992			0.995		0.950		
Satd. Flow (perm)	0	1798	0	0	1774	0	0	1826	0	1630	1783	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	70	112	30	47	153	83	32	259	37	54	190	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	212	0	0	283	0	0	328	0	54	267	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.4%						ICU Level of Service B					
Analysis Period (min)	15											

Intersection

Intersection Delay, s/veh	15.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	103	28	43	141	76	29	238	34	50	175	71
Future Vol, veh/h	64	103	28	43	141	76	29	238	34	50	175	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	70	112	30	47	153	83	32	259	37	54	190	77
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	13.9	15.6	17.6	14.8
HCM LOS	B	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	10%	33%	17%	100%	0%
Vol Thru, %	79%	53%	54%	0%	71%
Vol Right, %	11%	14%	29%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	301	195	260	50	246
LT Vol	29	64	43	50	0
Through Vol	238	103	141	0	175
RT Vol	34	28	76	0	71
Lane Flow Rate	327	212	283	54	267
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.574	0.39	0.498	0.11	0.49
Departure Headway (Hd)	6.318	6.632	6.338	7.309	6.591
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	569	540	568	490	545
Service Time	4.372	4.695	4.394	5.064	4.346
HCM Lane V/C Ratio	0.575	0.393	0.498	0.11	0.49
HCM Control Delay, s/veh	17.6	13.9	15.6	11	15.6
HCM Lane LOS	C	B	C	B	C
HCM 95th-tile Q	3.6	1.8	2.8	0.4	2.7

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	6	4	3	6	0	1	30	1	1	60	3
Future Volume (vph)	1	6	4	3	6	0	1	30	1	1	60	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955						0.996			0.994	
Flt Protected		0.996			0.985			0.999			0.999	
Satd. Flow (prot)	0	1772	0	0	1835	0	0	1853	0	0	1850	0
Flt Permitted		0.996			0.985			0.999			0.999	
Satd. Flow (perm)	0	1772	0	0	1835	0	0	1853	0	0	1850	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		588			2659			1363			540	
Travel Time (s)		7.3			33.0			16.9			6.7	
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
Adj. Flow (vph)	1	7	4	3	7	0	1	33	1	1	65	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	10	0	0	35	0	0	69	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	13.8%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	6	4	3	6	0	1	30	1	1	60	3
Future Vol, veh/h	1	6	4	3	6	0	1	30	1	1	60	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	7	4	3	7	0	1	33	1	1	65	3
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, s/veh	7	7.3	7.2	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	9%	33%	2%
Vol Thru, %	94%	55%	67%	94%
Vol Right, %	3%	36%	0%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	11	9	64
LT Vol	1	1	3	1
Through Vol	30	6	6	60
RT Vol	1	4	0	3
Lane Flow Rate	35	12	10	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.039	0.013	0.011	0.077
Departure Headway (Hd)	4.013	3.923	4.191	3.974
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	893	907	850	904
Service Time	2.033	1.969	2.238	1.989
HCM Lane V/C Ratio	0.039	0.013	0.012	0.077
HCM Control Delay, s/veh	7.2	7	7.3	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	4	6	15	6	1	2	31	6	0	52	2
Future Volume (vph)	1	4	6	15	6	1	2	31	6	0	52	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.921			0.994			0.978			0.995	
Flt Protected		0.996			0.968			0.998				
Satd. Flow (prot)	0	1709	0	0	1792	0	0	1818	0	0	1853	0
Flt Permitted		0.996			0.968			0.998				
Satd. Flow (perm)	0	1709	0	0	1792	0	0	1818	0	0	1853	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2659			2643			2647			315	
Travel Time (s)		33.0			32.8			32.8			3.9	
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
Adj. Flow (vph)	1	4	7	16	7	1	2	34	7	0	57	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	24	0	0	43	0	0	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 15.8%	ICU Level of Service A											
Analysis Period (min) 15												

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	4	6	15	6	1	2	31	6	0	52	2
Future Vol, veh/h	1	4	6	15	6	1	2	31	6	0	52	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	-	-	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	4	7	16	7	1	2	34	7	0	57	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	8	0	0	11	0	0	79	50	8	70	53	8
Stage 1	-	-	-	-	-	-	10	10	-	40	40	-
Stage 2	-	-	-	-	-	-	69	40	-	30	13	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1612	-	-	1608	-	-	910	841	1074	922	838	1074
Stage 1	-	-	-	-	-	-	1011	887	-	975	862	-
Stage 2	-	-	-	-	-	-	941	862	-	987	885	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1612	-	-	1608	-	-	854	832	1074	881	829	1074
Mov Cap-2 Maneuver	-	-	-	-	-	-	854	832	-	881	829	-
Stage 1	-	-	-	-	-	-	1010	886	-	974	853	-
Stage 2	-	-	-	-	-	-	868	853	-	943	884	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.7	5	9.4	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	863	1612	-	-	1608	-	-	836
HCM Lane V/C Ratio	0.049	0.001	-	-	0.01	-	-	0.07
HCM Control Delay (s/veh)	9.4	7.2	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q (veh)	0.2	0	-	-	0	-	-	0.2



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	4	5	485	624	10
Future Volume (vph)	5	4	5	485	624	10
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940				0.998	
Flt Protected	0.973					
Satd. Flow (prot)	1569	0	0	1863	1859	0
Flt Permitted	0.973					
Satd. Flow (perm)	1569	0	0	1863	1859	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	4	5	527	678	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	532	689	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.4% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	4	5	485	624	10
Future Vol, veh/h	5	4	5	485	624	10
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	5	4	5	527	678	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1221	684	689
Stage 1	684	-	-
Stage 2	537	-	-
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	199	449	905
Stage 1	501	-	-
Stage 2	586	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	197	449	905
Mov Cap-2 Maneuver	197	-	-
Stage 1	497	-	-
Stage 2	586	-	-

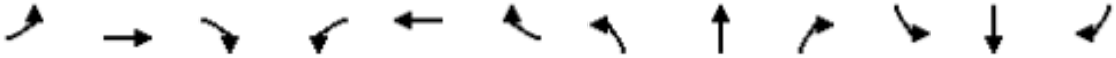
Approach	EB	NB	SB
HCM Control Delay, s/v	19.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	905	-	262	-	-
HCM Lane V/C Ratio	0.006	-	0.037	-	-
HCM Control Delay (s/veh)	9	0	19.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q (veh)	0	-	0.1	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	722	62	241	895	92	72	56	155	78	70	3
Future Volume (vph)	5	722	62	241	895	92	72	56	155	78	70	3
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.986			0.890			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3479	0	1630	1636	0	1630	1850	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1429	1630	3479	0	1630	1636	0	1630	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			165		12			131			2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	5	785	67	262	973	100	78	61	168	85	76	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	785	67	262	1073	0	78	229	0	85	79	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
4: N Del Norte Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	33.6	33.6	26.0	50.7		12.1	38.4		12.0	38.3	
Total Split (%)	8.1%	30.5%	30.5%	23.6%	46.1%		11.0%	34.9%		10.9%	34.8%	
Maximum Green (s)	4.0	28.7	28.7	21.1	45.8		7.2	33.5		7.1	33.4	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.3	45.0	45.0	22.0	69.2		8.0	16.2		10.8	21.3	
Actuated g/C Ratio	0.06	0.41	0.41	0.20	0.63		0.07	0.15		0.10	0.19	
v/c Ratio	0.05	0.54	0.10	0.80	0.49		0.66	0.65		0.53	0.22	
Control Delay (s/veh)	50.8	28.6	0.3	31.5	1.7		75.9	26.0		60.4	35.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	50.8	28.6	0.3	31.5	1.7		75.9	26.0		60.4	35.6	
LOS	D	C	A	C	A		E	C		E	D	
Approach Delay (s/veh)		26.6			7.6			38.7			48.5	
Approach LOS		C			A			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 70 (64%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 19.8

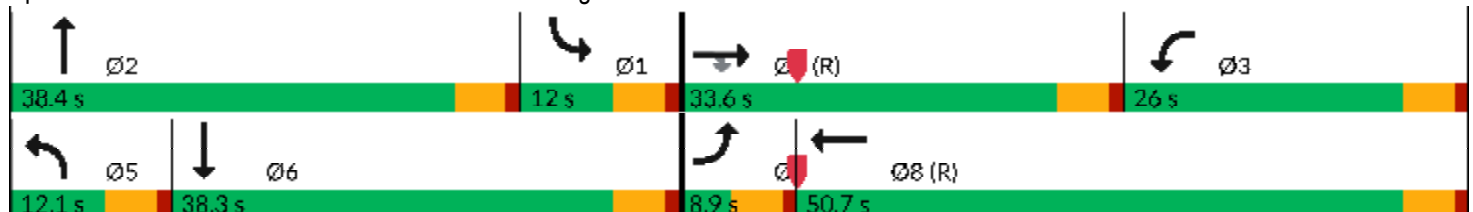
Intersection LOS: B

Intersection Capacity Utilization 68.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

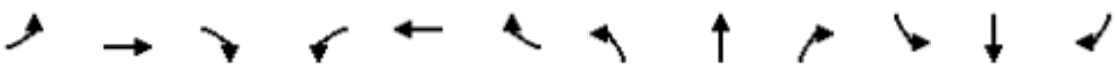
4: N Del Norte Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	722	62	241	895	92	72	56	155	78	70	3
Future Volume (veh/h)	5	722	62	241	895	92	72	56	155	78	70	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	5	785	67	262	973	100	78	61	168	85	76	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	956	385	534	1886	194	110	81	224	118	344	14
Arrive On Green	0.01	0.27	0.27	0.65	1.00	1.00	0.07	0.19	0.18	0.07	0.19	0.18
Sat Flow, veh/h	1641	3554	1432	1641	3244	333	1641	432	1191	1641	1785	70
Grp Volume(v), veh/h	5	785	67	262	533	540	78	0	229	85	0	79
Grp Sat Flow(s),veh/h/ln	1641	1777	1432	1641	1777	1800	1641	0	1623	1641	0	1856
Q Serve(g_s), s	0.3	22.8	3.1	9.0	0.0	0.0	5.1	0.0	14.7	5.6	0.0	3.9
Cycle Q Clear(g_c), s	0.3	22.8	3.1	9.0	0.0	0.0	5.1	0.0	14.7	5.6	0.0	3.9
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.73	1.00		0.04
Lane Grp Cap(c), veh/h	22	956	385	534	1033	1047	110	0	305	118	0	358
V/C Ratio(X)	0.23	0.82	0.17	0.49	0.52	0.52	0.71	0.00	0.75	0.72	0.00	0.22
Avail Cap(c_a), veh/h	73	956	385	534	1033	1047	121	0	508	119	0	579
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	37.7	19.1	14.5	0.0	0.0	50.3	0.0	42.6	50.0	0.0	37.4
Incr Delay (d2), s/veh	5.2	7.9	1.0	0.3	0.8	0.8	15.9	0.0	3.7	18.8	0.0	0.3
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	0.2	10.3	1.4	2.5	0.2	0.2	2.5	0.0	5.9	2.8	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.9	45.6	20.0	14.8	0.8	0.8	66.1	0.0	46.3	68.7	0.0	37.8
LnGrp LOS	E	D	C	B	A	A	E		D	E		D
Approach Vol, veh/h		857			1335			307			164	
Approach Delay, s/veh		43.7			3.5			51.3			53.8	
Approach LOS		D			A			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.9	24.7	39.8	33.6	11.4	25.2	5.5	68.0				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	7.1	33.5	21.1	28.7	7.2	33.4	4.0	45.8				
Max Q Clear Time (g_c+I1), s	7.6	16.7	11.0	24.8	7.1	5.9	2.3	2.0				
Green Ext Time (p_c), s	0.0	0.7	0.6	1.5	0.0	0.2	0.0	4.6				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			25.1									
HCM 6th LOS			C									

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	744	155	172	919	102	228	359	159	167	347	107
Future Volume (vph)	142	744	155	172	919	102	228	359	159	167	347	107
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.974			0.985				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3436	0	1630	3475	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3436	0	1630	3475	0	1630	3539	1430	1630	3539	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			11				173			165
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	154	809	168	187	999	111	248	390	173	182	377	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	977	0	187	1110	0	248	390	173	182	377	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	16.0	38.0		18.0	40.0		22.0	34.0	34.0	20.0	32.0	32.0
Total Split (%)	14.5%	34.5%		16.4%	36.4%		20.0%	30.9%	30.9%	18.2%	29.1%	29.1%
Maximum Green (s)	11.1	33.1		13.1	35.1		17.1	29.1	29.1	15.1	27.1	27.1
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	12.2	34.6		15.7	38.1		22.7	25.1	25.1	18.6	21.0	21.0
Actuated g/C Ratio	0.11	0.31		0.14	0.35		0.21	0.23	0.23	0.17	0.19	0.19
v/c Ratio	0.86	0.89		0.81	0.92		0.74	0.48	0.38	0.66	0.56	0.29
Control Delay (s/veh)	77.1	38.0		72.4	47.4		39.1	24.3	6.2	57.1	43.8	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	77.1	38.0		72.4	47.4		39.1	24.3	6.2	57.1	43.8	3.5
LOS	E	D		E	D		D	C	A	E	D	A
Approach Delay (s/veh)		43.3			51.0			24.9			40.5	
Approach LOS		D			D			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 104 (95%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay (s/veh): 41.6

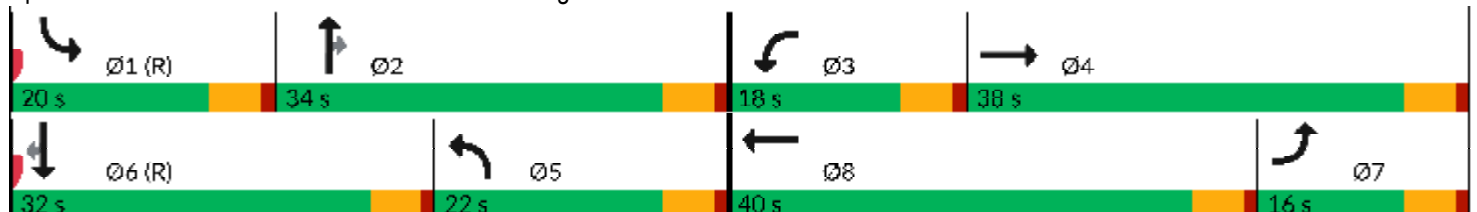
Intersection LOS: D

Intersection Capacity Utilization 85.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	744	155	172	919	102	228	359	159	167	347	107
Future Volume (veh/h)	142	744	155	172	919	102	228	359	159	167	347	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	154	809	168	187	999	111	248	390	173	182	377	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	902	187	209	1052	117	431	693	279	366	553	222
Arrive On Green	0.07	0.21	0.20	0.13	0.33	0.32	0.18	0.13	0.13	0.22	0.16	0.16
Sat Flow, veh/h	1641	2919	606	1641	3213	357	1641	3554	1428	1641	3554	1424
Grp Volume(v), veh/h	154	493	484	187	552	558	248	390	173	182	377	116
Grp Sat Flow(s),veh/h/ln	1641	1777	1748	1641	1777	1793	1641	1777	1428	1641	1777	1424
Q Serve(g_s), s	10.2	29.7	29.7	12.3	33.4	33.4	15.2	11.3	12.6	10.7	11.0	8.2
Cycle Q Clear(g_c), s	10.2	29.7	29.7	12.3	33.4	33.4	15.2	11.3	12.6	10.7	11.0	8.2
Prop In Lane	1.00		0.35	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	549	540	209	582	587	431	693	279	366	553	222
V/C Ratio(X)	0.86	0.90	0.90	0.90	0.95	0.95	0.58	0.56	0.62	0.50	0.68	0.52
Avail Cap(c_a), veh/h	179	549	540	209	582	587	431	969	389	366	905	363
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	0.85	0.85	0.85	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	41.9	42.0	47.3	36.1	36.2	39.7	43.4	44.0	37.3	43.9	42.7
Incr Delay (d2), s/veh	27.6	14.8	15.0	31.5	22.8	22.8	1.6	0.6	2.0	1.0	6.7	8.6
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	5.5	15.3	15.1	6.6	16.9	17.1	6.4	5.0	4.6	4.1	5.1	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	77.7	56.7	57.0	78.7	58.9	59.0	41.3	44.0	45.9	38.4	50.6	51.3
LnGrp LOS	E	E	E	E	E	E	D	D	D	D	D	D
Approach Vol, veh/h		1131			1297			811			675	
Approach Delay, s/veh		59.7			61.8			43.6			47.4	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.5	25.5	18.0	38.0	32.9	21.1	16.0	40.0				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	15.1	29.1	13.1	33.1	17.1	27.1	11.1	35.1				
Max Q Clear Time (g_c+I1), s	12.7	14.6	14.3	31.7	17.2	13.0	12.2	35.4				
Green Ext Time (p_c), s	0.1	2.0	0.0	0.7	0.0	1.7	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			55.0									
HCM 6th LOS			D									

Lanes, Volumes, Timings
6: S Vineland Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	1071	272	74	881	10	162	9	75	3	33	20
Future Volume (vph)	26	1071	272	74	881	10	162	9	75	3	33	20
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00			0.98			0.99	
Frt			0.850		0.998			0.866			0.943	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3531	0	1630	1585	0	1630	1744	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1407	1630	3531	0	1630	1585	0	1630	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			296		1			82			22	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	28	1164	296	80	958	11	176	10	82	3	36	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	1164	296	80	969	0	176	92	0	3	58	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	10.6	50.1	50.1	13.2	52.7		21.1	47.8		8.9	35.6	
Total Split (%)	8.8%	41.8%	41.8%	11.0%	43.9%		17.6%	39.8%		7.4%	29.7%	
Maximum Green (s)	5.7	45.2	45.2	8.3	47.8		16.2	42.9		4.0	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	7.6	64.1	64.1	9.2	70.1		17.8	32.9		4.9	12.9	
Actuated g/C Ratio	0.06	0.53	0.53	0.08	0.58		0.15	0.27		0.04	0.11	
v/c Ratio	0.27	0.62	0.33	0.65	0.47		0.73	0.19		0.05	0.28	
Control Delay (s/veh)	60.4	23.3	3.6	77.7	18.3		66.6	8.3		57.0	33.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	60.4	23.3	3.6	77.7	18.3		66.6	8.3		57.0	33.4	
LOS	E	C	A	E	B		E	A		E	C	
Approach Delay (s/veh)		20.1			22.8			46.6			34.6	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay (s/veh): 23.9

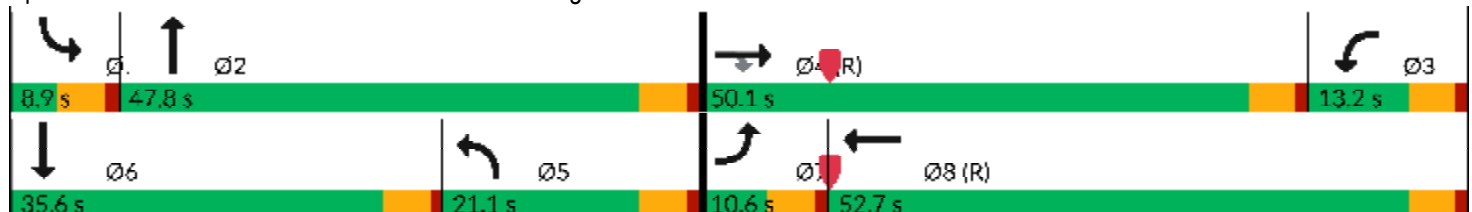
Intersection LOS: C

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

PM Future+Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	1071	272	74	881	10	162	9	75	3	33	20
Future Volume (veh/h)	26	1071	272	74	881	10	162	9	75	3	33	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.96
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			
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	28	1164	296	80	958	11	176	10	82	3	36	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	1365	545	433	2231	26	212	36	293	18	96	58
Arrive On Green	0.03	0.38	0.38	0.26	0.62	0.61	0.13	0.21	0.20	0.01	0.09	0.08
Sat Flow, veh/h	1641	3554	1419	1641	3597	41	1641	172	1408	1641	1070	654
Grp Volume(v), veh/h	28	1164	296	80	473	496	176	0	92	3	0	58
Grp Sat Flow(s),veh/h/ln	1641	1777	1419	1641	1777	1862	1641	0	1580	1641	0	1724
Q Serve(g_s), s	2.0	36.0	19.5	4.5	16.5	16.5	12.6	0.0	5.9	0.2	0.0	3.8
Cycle Q Clear(g_c), s	2.0	36.0	19.5	4.5	16.5	16.5	12.6	0.0	5.9	0.2	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.89	1.00		0.38
Lane Grp Cap(c), veh/h	46	1365	545	433	1102	1155	212	0	328	18	0	154
V/C Ratio(X)	0.61	0.85	0.54	0.18	0.43	0.43	0.83	0.00	0.28	0.17	0.00	0.38
Avail Cap(c_a), veh/h	90	1365	545	433	1102	1155	234	0	577	67	0	454
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)	0.51	0.51	0.51	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.7	33.8	28.8	34.2	11.8	11.8	51.0	0.0	40.3	58.8	0.0	51.7
Incr Delay (d2), s/veh	6.6	3.7	2.0	0.2	1.2	1.2	20.2	0.0	0.5	4.5	0.0	1.5
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	0.9	15.0	6.5	1.8	5.9	6.2	6.1	0.0	2.3	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	64.3	37.5	30.7	34.4	13.0	13.0	71.1	0.0	40.8	63.4	0.0	53.2
LnGrp LOS	E	D	C	C	B	B	E		D	E		D
Approach Vol, veh/h	1488				1049				268			
Approach Delay, s/veh	36.7				14.6				60.7			
Approach LOS	D				B				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	28.9	35.7	50.1	19.5	14.7	7.3	78.4				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	42.9	8.3	45.2	16.2	30.7	5.7	47.8				
Max Q Clear Time (g_c+I1), s	2.2	7.9	6.5	38.0	14.6	5.8	4.0	18.5				
Green Ext Time (p_c), s	0.0	0.3	0.0	3.9	0.1	0.1	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	31.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	282	29	46	330	71	15	72	20	70	62	82
Future Volume (vph)	69	282	29	46	330	71	15	72	20	70	62	82
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.967			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3422	0	1630	3235	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3422	0	1630	3235	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	75	307	32	50	359	77	16	78	22	76	67	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	307	32	50	359	77	16	100	0	76	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	44.2%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	282	29	46	330	71	15	72	20	70	62	82
Future Vol, veh/h	69	282	29	46	330	71	15	72	20	70	62	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	75	307	32	50	359	77	16	78	22	76	67	89
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	17.5	20.1	11.5	11.9
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	55%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	45%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	48	44	69	282	29	46	330	71	70	41
LT Vol	15	0	0	69	0	0	46	0	0	70	0
Through Vol	0	48	24	0	282	0	0	330	0	0	41
RT Vol	0	0	20	0	0	29	0	0	71	0	0
Lane Flow Rate	16	52	48	75	307	32	50	359	77	76	45
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.038	0.115	0.101	0.157	0.598	0.055	0.103	0.689	0.133	0.172	0.095
Departure Headway (Hd)	8.444	7.944	7.626	7.523	7.023	6.323	7.418	6.918	6.218	8.134	7.634
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	424	451	470	478	515	567	486	527	580	441	470
Service Time	6.191	5.691	5.373	5.257	4.757	4.057	5.118	4.618	3.918	5.875	5.375
HCM Lane V/C Ratio	0.038	0.115	0.102	0.157	0.596	0.056	0.103	0.681	0.133	0.172	0.096
HCM Control Delay, s/veh	11.5	11.7	11.2	11.7	19.7	9.4	11	23.6	9.9	12.6	11.2
HCM Lane LOS	B	B	B	B	C	A	B	C	A	B	B
HCM 95th-tile Q	0.1	0.4	0.3	0.6	3.9	0.2	0.3	5.3	0.5	0.6	0.3

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	275	93	107	235	99	57	637	59	96	451	57
Future Volume (vph)	79	275	93	107	235	99	57	637	59	96	451	57
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.987			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3483	0	1630	3471	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1429	1630	1863	1431	1630	3483	0	1630	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			165			165		9			14	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	86	299	101	116	255	108	62	692	64	104	490	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	299	101	116	255	108	62	756	0	104	552	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	17.0	33.0	33.0	20.0	36.0	36.0	14.2	38.9		18.1	42.8	
Total Split (%)	15.5%	30.0%	30.0%	18.2%	32.7%	32.7%	12.9%	35.4%		16.5%	38.9%	
Maximum Green (s)	12.1	28.1	28.1	15.1	31.1	31.1	9.3	34.0		13.2	37.9	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	14.3	23.3	23.3	13.4	24.6	24.6	9.6	44.9		12.4	49.9	
Actuated g/C Ratio	0.13	0.21	0.21	0.12	0.22	0.22	0.09	0.41		0.11	0.45	
v/c Ratio	0.41	0.76	0.23	0.59	0.61	0.24	0.44	0.53		0.57	0.35	
Control Delay (s/veh)	49.0	53.0	1.9	57.4	45.3	2.3	57.0	28.0		38.5	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	49.0	53.0	1.9	57.4	45.3	2.3	57.0	28.0		38.5	11.8	
LOS	D	D	A	E	D	A	E	C		D	B	
Approach Delay (s/veh)		41.6			38.6			30.2			16.0	
Approach LOS		D			D			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay (s/veh): 30.3

Intersection LOS: C

Intersection Capacity Utilization 60.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

PM Future+Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	275	93	107	235	99	57	637	59	96	451	57
Future Volume (veh/h)	79	275	93	107	235	99	57	637	59	96	451	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	86	299	101	116	255	108	62	692	64	104	490	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	365	279	154	339	259	91	811	75	522	1616	204
Arrive On Green	0.11	0.20	0.20	0.09	0.18	0.18	0.06	0.25	0.24	0.64	1.00	1.00
Sat Flow, veh/h	1641	1870	1428	1641	1870	1427	1641	3278	303	1641	3169	399
Grp Volume(v), veh/h	86	299	101	116	255	108	62	375	381	104	274	278
Grp Sat Flow(s),veh/h/ln	1641	1870	1428	1641	1870	1427	1641	1777	1804	1641	1777	1791
Q Serve(g_s), s	5.4	16.8	6.7	7.6	14.2	7.4	4.1	22.1	22.2	2.9	0.0	0.0
Cycle Q Clear(g_c), s	5.4	16.8	6.7	7.6	14.2	7.4	4.1	22.1	22.2	2.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.22
Lane Grp Cap(c), veh/h	177	365	279	154	339	259	91	439	446	522	906	913
V/C Ratio(X)	0.49	0.82	0.36	0.75	0.75	0.42	0.68	0.85	0.85	0.20	0.30	0.30
Avail Cap(c_a), veh/h	194	493	377	239	544	415	152	564	572	522	906	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	46.2	42.4	38.3	48.6	42.7	39.9	51.0	39.5	39.6	14.2	0.0	0.0
Incr Delay (d2), s/veh	2.0	7.8	0.8	7.2	3.4	1.1	8.7	18.6	18.5	0.1	0.6	0.6
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	2.2	8.1	2.3	3.3	6.5	2.5	1.8	11.3	11.5	1.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.2	50.2	39.1	55.8	46.1	41.0	59.7	58.1	58.1	14.3	0.6	0.6
LnGrp LOS	D	D	D	E	D	D	E	E	E	B	A	A
Approach Vol, veh/h	486			479			818			656		
Approach Delay, s/veh	47.5			47.3			58.2			2.8		
Approach LOS	D			D			E			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.0	31.2	14.3	25.5	10.1	60.1	15.9	23.9				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	13.2	34.0	15.1	28.1	9.3	37.9	12.1	31.1				
Max Q Clear Time (g_c+I1), s	4.9	24.2	9.6	18.8	6.1	2.0	7.4	16.2				
Green Ext Time (p_c), s	0.2	2.1	0.1	1.0	0.0	2.0	0.1	1.1				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	39.0											
HCM 6th LOS	D											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

PM Future+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	128	36	43	171	76	40	276	34	50	205	71
Future Volume (vph)	64	128	36	43	171	76	40	276	34	50	205	71
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.965			0.987			0.961	
Flt Protected		0.986			0.993			0.994		0.950		
Satd. Flow (prot)	0	1798	0	0	1785	0	0	1827	0	1630	1790	0
Flt Permitted		0.986			0.993			0.994		0.950		
Satd. Flow (perm)	0	1798	0	0	1785	0	0	1827	0	1630	1790	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	70	139	39	47	186	83	43	300	37	54	223	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	316	0	0	380	0	54	300	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	66.0%						ICU Level of Service C					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	22.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	128	36	43	171	76	40	276	34	50	205	71
Future Vol, veh/h	64	128	36	43	171	76	40	276	34	50	205	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	70	139	39	47	186	83	43	300	37	54	223	77
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	18.1	21.4	28	19.8
HCM LOS	C	C	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	11%	28%	15%	100%	0%
Vol Thru, %	79%	56%	59%	0%	74%
Vol Right, %	10%	16%	26%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	350	228	290	50	276
LT Vol	40	64	43	50	0
Through Vol	276	128	171	0	205
RT Vol	34	36	76	0	71
Lane Flow Rate	380	248	315	54	300
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.744	0.512	0.625	0.122	0.614
Departure Headway (Hd)	7.045	7.438	7.135	8.07	7.37
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	514	483	504	443	489
Service Time	5.106	5.506	5.196	5.831	5.131
HCM Lane V/C Ratio	0.739	0.513	0.625	0.122	0.613
HCM Control Delay, s/veh	28	18.1	21.4	12	21.2
HCM Lane LOS	D	C	C	B	C
HCM 95th-tile Q	6.3	2.9	4.2	0.4	4.1

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	3	0	0	0	1	109	0	1	22	0
Future Volume (vph)	0	1	3	0	0	0	1	109	0	1	22	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.899											
Flt Protected											0.998	
Satd. Flow (prot)	0	1675	0	0	1863	0	0	1863	0	0	1859	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1675	0	0	1863	0	0	1863	0	0	1859	0
Link Speed (mph)	55				55				55			
Link Distance (ft)	588				2659				1363			
Travel Time (s)	7.3				33.0				16.9			
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
Adj. Flow (vph)	0	1	3	0	0	0	1	118	0	1	24	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	119	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0			
Link Offset(ft)	0				0				0			
Crosswalk Width(ft)	16				16				16			
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 16.1% ICU Level of Service A												
Analysis Period (min) 15												

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	3	0	0	0	1	109	0	1	22	0
Future Vol, veh/h	0	1	3	0	0	0	1	109	0	1	22	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	3	0	0	0	1	118	0	1	24	0
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, s/veh	6.8	0	7.6	7.2
HCM LOS	A	-	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	0%	4%
Vol Thru, %	99%	25%	100%	96%
Vol Right, %	0%	75%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	4	0	23
LT Vol	1	0	0	1
Through Vol	109	1	0	22
RT Vol	0	3	0	0
Lane Flow Rate	120	4	0	25
Geometry Grp	1	1	1	1
Degree of Util (X)	0.132	0.005	0	0.028
Departure Headway (Hd)	3.962	3.732	4.187	4.039
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	909	949	0	886
Service Time	1.969	1.793	2.25	2.063
HCM Lane V/C Ratio	0.132	0.004	0	0.028
HCM Control Delay, s/veh	7.6	6.8	7.3	7.2
HCM Lane LOS	A	A	N	A
HCM 95th-tile Q	0.5	0	0	0.1

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	1	45	0	0	29	0
Future Volume (vph)	0	0	0	0	0	0	1	45	0	0	29	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected								0.999				
Satd. Flow (prot)	0	1863	0	0	1863	0	0	1861	0	0	1863	0
Flt Permitted								0.999				
Satd. Flow (perm)	0	1863	0	0	1863	0	0	1861	0	0	1863	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2659			2643			2647			315	
Travel Time (s)		33.0			32.8			32.8			3.9	
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
Adj. Flow (vph)	0	0	0	0	0	0	1	49	0	0	32	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	50	0	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 6.7%	ICU Level of Service A											
Analysis Period (min) 15												

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	0	0	0	0	0	0	1	45	0	0	29	0
Future Vol, veh/h	0	0	0	0	0	0	1	45	0	0	29	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	-	-	-	-	-	-	-	-	-	-	-	-
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	0	0	0	0	0	0	1	49	0	0	32	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	1	0	0	18	2	1	27	2	1
Stage 1	-	-	-	-	-	-	1	1	-	1	1	-
Stage 2	-	-	-	-	-	-	17	1	-	26	1	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1622	-	-	1622	-	-	996	894	1084	983	894	1084
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	1002	895	-	992	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1622	-	-	969	894	1084	942	894	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	969	894	-	942	894	-
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	967	895	-	938	895	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0	9.3	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	896	1622	-	-	1622	-	-	894
HCM Lane V/C Ratio	0.056	-	-	-	-	-	-	0.035
HCM Control Delay (s/veh)	9.3	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q (veh)	0.2	0	-	-	0	-	-	0.1

Lanes, Volumes, Timings
3: S Madera Ave & Nielsen Ave

AM Existing
05/23/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	226	339	1
Future Volume (vph)	0	1	0	226	339	1
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1484	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1484	0	0	1863	1863	0
Link Speed (mph)	55			55		
Link Distance (ft)	2643			2662		
Travel Time (s)	32.8			33.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	0	246	368	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	246	369	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12		
Link Offset(ft)	0			0		
Crosswalk Width(ft)	16			16		
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15	9		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 27.9%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	226	339	1
Future Vol, veh/h	0	1	0	226	339	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	0	1	0	246	368	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	615	369	369
Stage 1	369	-	-
Stage 2	246	-	-
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	455	677	1190
Stage 1	699	-	-
Stage 2	795	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	455	677	1190
Mov Cap-2 Maneuver	455	-	-
Stage 1	699	-	-
Stage 2	795	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	677	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s/veh)	0	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	449	14	53	385	2	17	42	158	9	16	2
Future Volume (vph)	2	449	14	53	385	2	17	42	158	9	16	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.999			0.882			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1620	0	1630	1829	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3535	0	1630	1620	0	1630	1829	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128		1			172			2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	2	488	15	58	418	2	18	46	172	10	17	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	488	15	58	420	0	18	218	0	10	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	9.0	36.0	36.0	15.0	42.0		11.0	40.0		9.0	38.0	
Total Split (%)	9.0%	36.0%	36.0%	15.0%	42.0%		11.0%	40.0%		9.0%	38.0%	
Maximum Green (s)	4.1	31.1	31.1	10.1	37.1		6.1	35.1		4.1	33.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.4	62.9	62.9	10.1	72.9		6.8	15.3		5.0	12.7	
Actuated g/C Ratio	0.06	0.63	0.63	0.10	0.73		0.07	0.15		0.05	0.13	
v/c Ratio	0.02	0.22	0.02	0.35	0.16		0.16	0.55		0.12	0.08	
Control Delay (s/veh)	44.5	12.3	0.0	47.7	8.1		47.4	13.8		49.0	31.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	44.5	12.3	0.0	47.7	8.1		47.4	13.8		49.0	31.1	
LOS	D	B	A	D	A		D	B		D	C	
Approach Delay (s/veh)		12.0			12.9			16.4			37.2	
Approach LOS		B			B			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 42 (42%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay (s/veh): 13.8

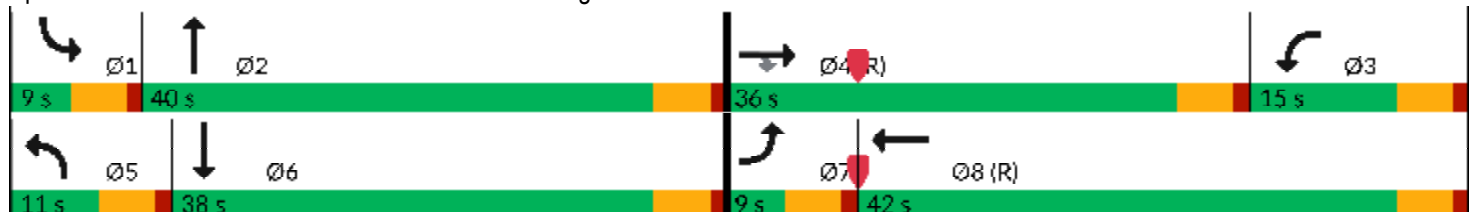
Intersection LOS: B

Intersection Capacity Utilization 48.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	449	14	53	385	2	17	42	158	9	16	2
Future Volume (veh/h)	2	449	14	53	385	2	17	42	158	9	16	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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			
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	2	488	15	58	418	2	18	46	172	10	17	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	18	1137	459	514	2256	11	41	64	239	31	298	35
Arrive On Green	0.01	0.32	0.32	0.31	0.62	0.61	0.02	0.19	0.18	0.02	0.18	0.17
Sat Flow, veh/h	1641	3554	1434	1641	3626	17	1641	339	1268	1641	1638	193
Grp Volume(v), veh/h	2	488	15	58	205	215	18	0	218	10	0	19
Grp Sat Flow(s),veh/h/ln	1641	1777	1434	1641	1777	1867	1641	0	1607	1641	0	1830
Q Serve(g_s), s	0.1	10.8	0.6	2.5	4.9	4.9	1.1	0.0	12.8	0.6	0.0	0.9
Cycle Q Clear(g_c), s	0.1	10.8	0.6	2.5	4.9	4.9	1.1	0.0	12.8	0.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.79	1.00		0.11
Lane Grp Cap(c), veh/h	18	1137	459	514	1105	1161	41	0	302	31	0	333
V/C Ratio(X)	0.11	0.43	0.03	0.11	0.19	0.19	0.44	0.00	0.72	0.33	0.00	0.06
Avail Cap(c_a), veh/h	82	1137	459	514	1105	1161	115	0	579	82	0	622
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	0.82	0.82	0.82	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	26.8	15.7	24.4	8.1	8.1	48.1	0.0	38.5	48.4	0.0	33.8
Incr Delay (d2), s/veh	2.6	1.2	0.1	0.1	0.3	0.3	7.4	0.0	3.2	6.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.4	0.2	0.9	1.6	1.7	0.5	0.0	5.0	0.3	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.5	28.0	15.8	24.5	8.4	8.4	55.5	0.0	41.7	54.5	0.0	33.9
LnGrp LOS	D	C	B	C	A	A	E		D	D		C
Approach Vol, veh/h	505				478				236			
Approach Delay, s/veh	27.7				10.3				42.8			
Approach LOS	C				B				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	22.8	35.3	36.0	6.5	22.2	5.1	66.2				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.1	35.1	10.1	31.1	6.1	33.1	4.1	37.1				
Max Q Clear Time (g_c+I1), s	2.6	14.8	4.5	12.8	3.1	2.9	2.1	6.9				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.9	0.0	0.0	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	24.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	476	56	76	426	23	93	129	61	67	194	88
Future Volume (vph)	63	476	56	76	426	23	93	129	61	67	194	88
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.984			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3476	0	1630	3505	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3476	0	1630	3505	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			6				191			191
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	68	517	61	83	463	25	101	140	66	73	211	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	578	0	83	488	0	101	140	66	73	211	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	13.9	34.1		14.0	34.2		16.0	33.4	33.4	13.5	30.9	30.9
Total Split (%)	14.6%	35.9%		14.7%	36.0%		16.8%	35.2%	35.2%	14.2%	32.5%	32.5%
Maximum Green (s)	9.0	29.2		9.1	29.3		11.1	28.5	28.5	8.6	26.0	26.0
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	11.4	22.3		10.0	20.9		11.3	15.1	15.1	33.7	39.8	39.8
Actuated g/C Ratio	0.12	0.23		0.11	0.22		0.12	0.16	0.16	0.35	0.42	0.42
v/c Ratio	0.35	0.70		0.49	0.63		0.52	0.25	0.17	0.13	0.14	0.14
Control Delay (s/veh)	43.2	36.7		49.6	36.3		48.6	33.7	1.0	30.2	21.9	0.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.2	36.7		49.6	36.3		48.6	33.7	1.0	30.2	21.9	0.4
LOS	D	D		D	D		D	C	A	C	C	A
Approach Delay (s/veh)		37.4			38.3			31.6			18.1	
Approach LOS		D			D			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 0 (0%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay (s/veh): 32.8

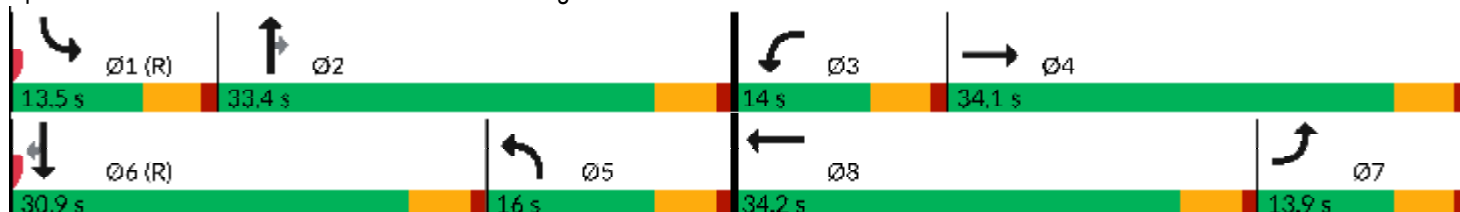
Intersection LOS: C

Intersection Capacity Utilization 60.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	476	56	76	426	23	93	129	61	67	194	88
Future Volume (veh/h)	63	476	56	76	426	23	93	129	61	67	194	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.96	1.00		0.97	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	68	517	61	83	463	25	101	140	66	73	211	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	689	81	119	655	35	685	499	200	662	449	179
Arrive On Green	0.10	0.22	0.21	0.07	0.19	0.18	0.42	0.14	0.14	0.40	0.13	0.13
Sat Flow, veh/h	1641	3195	375	1641	3421	184	1641	3554	1423	1641	3554	1420
Grp Volume(v), veh/h	68	287	291	83	240	248	101	140	66	73	211	96
Grp Sat Flow(s),veh/h/ln	1641	1777	1793	1641	1777	1829	1641	1777	1423	1641	1777	1420
Q Serve(g_s), s	3.7	14.3	14.5	4.7	12.0	12.1	3.6	3.3	4.0	2.6	5.2	6.0
Cycle Q Clear(g_c), s	3.7	14.3	14.5	4.7	12.0	12.1	3.6	3.3	4.0	2.6	5.2	6.0
Prop In Lane	1.00		0.21	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	159	383	387	119	340	350	685	499	200	662	449	179
V/C Ratio(X)	0.43	0.75	0.75	0.70	0.71	0.71	0.15	0.28	0.33	0.11	0.47	0.54
Avail Cap(c_a), veh/h	171	563	568	173	565	581	685	1100	440	662	1006	402
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)	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	34.9	35.0	43.0	35.9	36.0	17.2	36.5	36.8	17.7	38.6	38.9
Incr Delay (d2), s/veh	1.8	3.1	3.2	7.1	2.6	2.6	0.1	0.3	1.0	0.1	3.5	11.0
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	1.5	6.0	6.2	2.0	5.1	5.2	1.2	1.4	1.3	0.9	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	42.2	37.9	38.2	50.1	38.5	38.6	17.3	36.8	37.8	17.8	42.1	49.9
LnGrp LOS	D	D	D	D	D	D	B	D	D	B	D	D
Approach Vol, veh/h		646			571			307			380	
Approach Delay, s/veh		38.5			40.2			30.6			39.4	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.3	17.3	10.9	24.5	43.6	16.0	13.2	22.2				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	8.6	28.5	9.1	29.2	11.1	26.0	9.0	29.3				
Max Q Clear Time (g_c+I1), s	4.6	6.0	6.7	16.5	5.6	8.0	5.7	14.1				
Green Ext Time (p_c), s	0.0	0.7	0.0	1.7	0.1	1.1	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			37.9									
HCM 6th LOS			D									

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	520	53	23	463	2	64	33	67	4	15	6
Future Volume (vph)	4	520	53	23	463	2	64	33	67	4	15	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00			0.99			0.99	
Frt			0.850		0.999			0.900			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1656	0	1630	1767	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1410	1630	3535	0	1630	1656	0	1630	1767	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181					73			7	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	4	565	58	25	503	2	70	36	73	4	16	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	565	58	25	505	0	70	109	0	4	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	9.0	37.4	37.4	11.0	39.4		16.0	42.6		9.0	35.6	
Total Split (%)	9.0%	37.4%	37.4%	11.0%	39.4%		16.0%	42.6%		9.0%	35.6%	
Maximum Green (s)	4.1	32.5	32.5	6.1	34.5		11.1	37.7		4.1	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.3	63.7	63.7	6.9	66.3		10.1	22.1		5.0	11.9	
Actuated g/C Ratio	0.06	0.64	0.64	0.07	0.66		0.10	0.22		0.05	0.12	
v/c Ratio	0.04	0.25	0.06	0.22	0.22		0.43	0.26		0.05	0.11	
Control Delay (s/veh)	45.5	12.2	0.1	49.1	10.5		49.8	11.9		46.8	27.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.5	12.2	0.1	49.1	10.5		49.8	11.9		46.8	27.0	
LOS	D	B	A	D	B		D	B		D	C	
Approach Delay (s/veh)		11.3			12.3			26.7			29.9	
Approach LOS		B			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 99 (99%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay (s/veh): 14.1

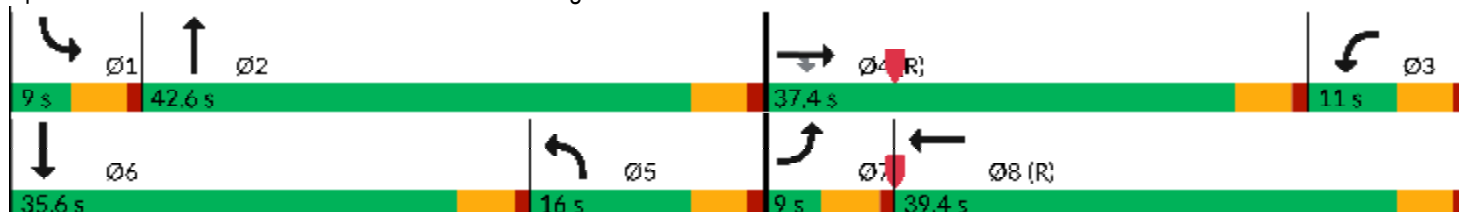
Intersection LOS: B

Intersection Capacity Utilization 42.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

AM Existing
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	520	53	23	463	2	64	33	67	4	15	6
Future Volume (veh/h)	4	520	53	23	463	2	64	33	67	4	15	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.96
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			
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	4	565	58	25	503	2	70	36	73	4	16	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	1187	473	590	2469	10	102	72	146	22	103	45
Arrive On Green	0.01	0.33	0.33	0.36	0.68	0.67	0.06	0.13	0.12	0.01	0.08	0.08
Sat Flow, veh/h	1641	3554	1417	1641	3630	14	1641	541	1096	1641	1218	533
Grp Volume(v), veh/h	4	565	58	25	246	259	70	0	109	4	0	23
Grp Sat Flow(s),veh/h/ln	1641	1777	1417	1641	1777	1867	1641	0	1637	1641	0	1750
Q Serve(g_s), s	0.2	12.6	2.8	1.0	5.1	5.1	4.2	0.0	6.2	0.2	0.0	1.2
Cycle Q Clear(g_c), s	0.2	12.6	2.8	1.0	5.1	5.1	4.2	0.0	6.2	0.2	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.67	1.00		0.30
Lane Grp Cap(c), veh/h	22	1187	473	590	1208	1270	102	0	218	22	0	147
V/C Ratio(X)	0.18	0.48	0.12	0.04	0.20	0.20	0.68	0.00	0.50	0.18	0.00	0.16
Avail Cap(c_a), veh/h	82	1187	473	590	1208	1270	197	0	632	82	0	553
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)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.8	26.4	23.1	20.8	5.9	5.9	45.9	0.0	40.5	48.8	0.0	42.6
Incr Delay (d2), s/veh	3.1	1.1	0.4	0.0	0.4	0.4	7.8	0.0	1.8	4.0	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	0.1	5.0	0.9	0.4	1.5	1.6	1.8	0.0	2.5	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.9	27.4	23.5	20.9	6.3	6.3	53.7	0.0	42.3	52.8	0.0	43.1
LnGrp LOS	D	C	C	C	A	A	D		D	D		D
Approach Vol, veh/h	627				530				179			
Approach Delay, s/veh	27.2				7.0				46.7			
Approach LOS	C				A				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	17.3	39.9	37.4	10.2	12.4	5.3	72.0				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.1	37.7	6.1	32.5	11.1	30.7	4.1	34.5				
Max Q Clear Time (g_c+l1), s	2.2	8.2	3.0	14.6	6.2	3.2	2.2	7.1				
Green Ext Time (p_c), s	0.0	0.4	0.0	2.4	0.1	0.0	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			22.3									
HCM 6th LOS			C									

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	161	5	9	101	9	4	49	18	39	31	37
Future Volume (vph)	63	161	5	9	101	9	4	49	18	39	31	37
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.959			0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3394	0	1630	3253	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3394	0	1630	3253	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	68	175	5	10	110	10	4	53	20	42	34	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	175	5	10	110	10	4	73	0	42	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	27.2%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection

Intersection Delay, s/veh	9.4
Intersection LOS	A

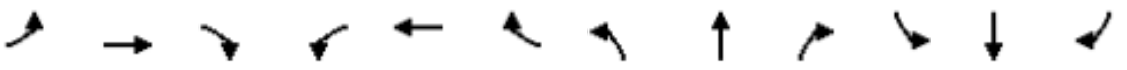
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	161	5	9	101	9	4	49	18	39	31	37
Future Vol, veh/h	63	161	5	9	101	9	4	49	18	39	31	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	175	5	10	110	10	4	53	20	42	34	40
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	9.8	9.3	8.7	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	48%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	52%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	33	34	63	161	5	9	101	9	39	21
LT Vol	4	0	0	63	0	0	9	0	0	39	0
Through Vol	0	33	16	0	161	0	0	101	0	0	21
RT Vol	0	0	18	0	0	5	0	0	9	0	0
Lane Flow Rate	4	36	37	68	175	5	10	110	10	42	22
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.008	0.057	0.056	0.111	0.26	0.007	0.017	0.17	0.013	0.073	0.036
Departure Headway (Hd)	6.29	5.79	5.423	5.843	5.343	4.643	6.076	5.576	4.876	6.212	5.712
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	565	614	655	611	669	765	586	639	728	573	622
Service Time	4.071	3.571	3.204	3.606	3.106	2.406	3.845	3.345	2.645	3.987	3.487
HCM Lane V/C Ratio	0.007	0.059	0.056	0.111	0.262	0.007	0.017	0.172	0.014	0.073	0.035
HCM Control Delay, s/veh	9.1	8.9	8.5	9.3	10	7.4	9	9.5	7.7	9.5	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0.2	0.2	0.4	1	0	0.1	0.6	0	0.2	0.1

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	115	45	24	137	68	30	277	11	32	287	28
Future Volume (vph)	23	115	45	24	137	68	30	277	11	32	287	28
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.994			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3513	0	1630	3487	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1432	1630	3513	0	1630	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		4			10	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	25	125	49	26	149	74	33	301	12	35	312	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	125	49	26	149	74	33	313	0	35	342	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	13.0	38.0	38.0	13.0	38.0	38.0	14.0	35.0		14.0	35.0	
Total Split (%)	13.0%	38.0%	38.0%	13.0%	38.0%	38.0%	14.0%	35.0%		14.0%	35.0%	
Maximum Green (s)	8.1	33.1	33.1	8.1	33.1	33.1	9.1	30.1		9.1	30.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	8.0	16.4	16.4	8.1	16.4	16.4	8.4	61.4		9.1	62.1	
Actuated g/C Ratio	0.08	0.16	0.16	0.08	0.16	0.16	0.08	0.61		0.09	0.62	
v/c Ratio	0.19	0.41	0.13	0.20	0.49	0.19	0.24	0.14		0.24	0.16	
Control Delay (s/veh)	45.8	39.5	0.7	45.8	41.6	1.1	46.3	13.0		45.3	12.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.8	39.5	0.7	45.8	41.6	1.1	46.3	13.0		45.3	12.5	
LOS	D	D	A	D	D	A	D	B		D	B	
Approach Delay (s/veh)		30.7			30.0			16.2			15.5	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 3 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay (s/veh): 21.4

Intersection LOS: C

Intersection Capacity Utilization 49.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

AM Existing

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	115	45	24	137	68	30	277	11	32	287	28
Future Volume (veh/h)	23	115	45	24	137	68	30	277	11	32	287	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.95	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	25	125	49	26	149	74	33	301	12	35	312	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	254	193	49	255	194	54	471	19	885	2101	200
Arrive On Green	0.03	0.14	0.14	0.03	0.14	0.14	0.03	0.14	0.13	0.54	0.64	0.63
Sat Flow, veh/h	1641	1870	1422	1641	1870	1422	1641	3477	138	1641	3273	312
Grp Volume(v), veh/h	25	125	49	26	149	74	33	153	160	35	168	174
Grp Sat Flow(s),veh/h/ln	1641	1870	1422	1641	1870	1422	1641	1777	1838	1641	1777	1809
Q Serve(g_s), s	1.5	6.2	3.1	1.6	7.5	4.7	2.0	8.2	8.2	1.0	3.7	3.8
Cycle Q Clear(g_c), s	1.5	6.2	3.1	1.6	7.5	4.7	2.0	8.2	8.2	1.0	3.7	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.17
Lane Grp Cap(c), veh/h	48	254	193	49	255	194	54	240	249	885	1140	1161
V/C Ratio(X)	0.52	0.49	0.25	0.54	0.59	0.38	0.61	0.64	0.64	0.04	0.15	0.15
Avail Cap(c_a), veh/h	148	636	483	148	636	483	164	551	570	885	1140	1161
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	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	47.9	40.0	38.7	47.8	40.5	39.4	47.7	40.9	41.0	10.8	7.1	7.1
Incr Delay (d2), s/veh	8.7	1.5	0.7	8.9	2.1	1.2	10.6	12.2	12.1	0.0	0.3	0.3
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	2.8	1.1	0.7	3.4	1.6	0.9	4.2	4.3	0.3	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	56.5	41.5	39.4	56.7	42.7	40.6	58.3	53.1	53.1	10.9	7.4	7.4
LnGrp LOS	E	D	D	E	D	D	E	D	D	B	A	A
Approach Vol, veh/h	199			249			346			377		
Approach Delay, s/veh	42.9			43.5			53.6			7.7		
Approach LOS	D			D			D			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	58.0	17.5	7.0	17.6	7.3	68.2	6.9	17.6				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	9.1	30.1	8.1	33.1	9.1	30.1	8.1	33.1				
Max Q Clear Time (g_c+I1), s	3.0	10.2	3.6	8.2	4.0	5.8	3.5	9.5				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.5	0.0	1.1	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			34.9									
HCM 6th LOS			C									

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

AM Existing
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	83	37	20	71	43	35	123	23	41	167	19
Future Volume (vph)	30	83	37	20	71	43	35	123	23	41	167	19
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.957			0.983			0.984	
Flt Protected		0.990			0.993			0.990		0.950		
Satd. Flow (prot)	0	1783	0	0	1770	0	0	1813	0	1630	1833	0
Flt Permitted		0.990			0.993			0.990		0.950		
Satd. Flow (perm)	0	1783	0	0	1770	0	0	1813	0	1630	1833	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	33	90	40	22	77	47	38	134	25	45	182	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	163	0	0	146	0	0	197	0	45	203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	43.5%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	83	37	20	71	43	35	123	23	41	167	19
Future Vol, veh/h	30	83	37	20	71	43	35	123	23	41	167	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	90	40	22	77	47	38	134	25	45	182	21
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	9.9	9.6	10.3	10.5
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	19%	20%	15%	100%	0%
Vol Thru, %	68%	55%	53%	0%	90%
Vol Right, %	13%	25%	32%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	150	134	41	186
LT Vol	35	30	20	41	0
Through Vol	123	83	71	0	167
RT Vol	23	37	43	0	19
Lane Flow Rate	197	163	146	45	202
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.285	0.237	0.211	0.076	0.312
Departure Headway (Hd)	5.211	5.243	5.219	6.138	5.56
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	691	685	687	587	651
Service Time	3.236	3.274	3.25	3.838	3.26
HCM Lane V/C Ratio	0.285	0.238	0.213	0.077	0.31
HCM Control Delay, s/veh	10.3	9.9	9.6	9.3	10.8
HCM Lane LOS	B	A	A	A	B
HCM 95th-tile Q	1.2	0.9	0.8	0.2	1.3

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	3	3	0	2	0	1	109	0	1	22	0
Future Volume (vph)	0	3	3	0	2	0	1	109	0	1	22	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932											
Flt Protected											0.998	
Satd. Flow (prot)	0	1736	0	0	1863	0	0	1863	0	0	1859	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1736	0	0	1863	0	0	1863	0	0	1859	0
Link Speed (mph)	55				55				55			
Link Distance (ft)	588				2659				1363			
Travel Time (s)	7.3				33.0				16.9			
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
Adj. Flow (vph)	0	3	3	0	2	0	1	118	0	1	24	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	2	0	0	119	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0			
Link Offset(ft)	0				0				0			
Crosswalk Width(ft)	16				16				16			
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	16.1%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	3	0	2	0	1	109	0	1	22	0
Future Vol, veh/h	0	3	3	0	2	0	1	109	0	1	22	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	3	0	2	0	1	118	0	1	24	0
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, s/veh	7	7.3	7.6	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	0%	4%
Vol Thru, %	99%	50%	100%	96%
Vol Right, %	0%	50%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	6	2	23
LT Vol	1	0	0	1
Through Vol	109	3	2	22
RT Vol	0	3	0	0
Lane Flow Rate	120	7	2	25
Geometry Grp	1	1	1	1
Degree of Util (X)	0.132	0.007	0.003	0.028
Departure Headway (Hd)	3.97	3.884	4.189	4.047
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	906	912	847	884
Service Time	1.979	1.947	2.251	2.073
HCM Lane V/C Ratio	0.132	0.008	0.002	0.028
HCM Control Delay, s/veh	7.6	7	7.3	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0	0	0.1

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	2	10	0	0	3	52	6	0	33	0
Future Volume (vph)	0	0	2	10	0	0	3	52	6	0	33	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865						0.986					
Flt Protected				0.950			0.998					
Satd. Flow (prot)	0	1611	0	0	1770	0	0	1833	0	0	1863	0
Flt Permitted				0.950			0.998					
Satd. Flow (perm)	0	1611	0	0	1770	0	0	1833	0	0	1863	0
Link Speed (mph)	55			55			55			55		
Link Distance (ft)	2659			2643			2647			315		
Travel Time (s)	33.0			32.8			32.8			3.9		
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
Adj. Flow (vph)	0	0	2	11	0	0	3	57	7	0	36	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	0	11	0	0	67	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free			Free			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 19.5% ICU Level of Service A												
Analysis Period (min) 15												

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	2	10	0	0	3	52	6	0	33	0
Future Vol, veh/h	0	0	2	10	0	0	3	52	6	0	33	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	-	-	-	-	-	-	-	-	-	-	-	-
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	0	0	2	11	0	0	3	57	7	0	36	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	2	0	0	41	23	1	55	24	0
Stage 1	-	-	-	-	-	-	1	1	-	22	22	-
Stage 2	-	-	-	-	-	-	40	22	-	33	2	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	-	-	-	1620	-	-	963	870	1084	943	869	-
Stage 1	-	-	-	-	-	-	1022	895	-	996	877	-
Stage 2	-	-	-	-	-	-	975	877	-	983	894	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1620	-	-	-	864	1084	885	863	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	864	-	885	863	-
Stage 1	-	-	-	-	-	-	1022	895	-	996	871	-
Stage 2	-	-	-	-	-	-	928	871	-	915	894	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	7.2		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	1620	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.007	-	-	-
HCM Control Delay (s/veh)	-	0	-	-	7.2	0	-	-
HCM Lane LOS	-	A	-	-	A	A	-	-
HCM 95th %tile Q (veh)	-	-	-	-	0	-	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	1	0	226	339	6
Future Volume (vph)	6	1	0	226	339	6
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983				0.997	
Flt Protected	0.958					
Satd. Flow (prot)	1616	0	0	1863	1857	0
Flt Permitted	0.958					
Satd. Flow (perm)	1616	0	0	1863	1857	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1	0	246	368	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	246	375	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 28.2% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	1	0	226	339	6
Future Vol, veh/h	6	1	0	226	339	6
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	7	1	0	246	368	7

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	618	372	375
Stage 1	372	-	-
Stage 2	246	-	-
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	453	674	1183
Stage 1	697	-	-
Stage 2	795	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	453	674	1183
Mov Cap-2 Maneuver	453	-	-
Stage 1	697	-	-
Stage 2	795	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	12.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1183	-	475	-	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s/veh)	0	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Existing+Project

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	527	67	53	438	55	53	66	158	93	54	6
Future Volume (vph)	5	527	67	53	438	55	53	66	158	93	54	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.983			0.894			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3466	0	1630	1645	0	1630	1829	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3466	0	1630	1645	0	1630	1829	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181		14			131			7	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	5	573	73	58	476	60	58	72	172	101	59	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	573	73	58	536	0	58	244	0	101	66	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	30.9	30.9	13.5	35.5		13.5	38.4		17.2	42.1	
Total Split (%)	8.9%	30.9%	30.9%	13.5%	35.5%		13.5%	38.4%		17.2%	42.1%	
Maximum Green (s)	4.0	26.0	26.0	8.6	30.6		8.6	33.5		12.3	37.2	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	4.9	51.6	51.6	9.1	60.8		14.0	16.4		11.4	13.6	
Actuated g/C Ratio	0.05	0.52	0.52	0.09	0.61		0.14	0.16		0.11	0.14	
v/c Ratio	0.06	0.31	0.09	0.39	0.25		0.26	0.64		0.54	0.26	
Control Delay (s/veh)	47.2	19.4	0.2	66.2	6.2		39.8	24.1		52.5	33.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	47.2	19.4	0.2	66.2	6.2		39.8	24.1		52.5	33.9	
LOS	D	B	A	E	A		D	C		D	C	
Approach Delay (s/veh)		17.5			12.0			27.1			45.2	
Approach LOS		B			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 96 (96%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay (s/veh): 20.0

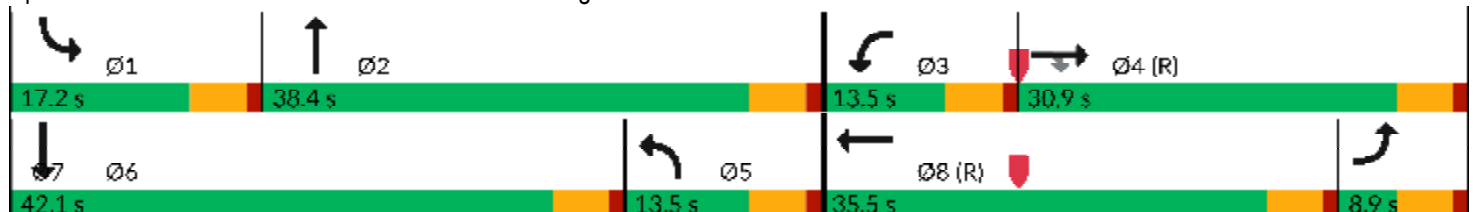
Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

AM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	527	67	53	438	55	53	66	158	93	54	6
Future Volume (veh/h)	5	527	67	53	438	55	53	66	158	93	54	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	5	573	73	58	476	60	58	72	172	101	59	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	394	1786	722	86	997	125	304	96	230	139	163	19
Arrive On Green	0.24	0.50	0.50	0.10	0.63	0.61	0.19	0.20	0.19	0.08	0.10	0.09
Sat Flow, veh/h	1641	3554	1437	1641	3164	397	1641	482	1151	1641	1634	194
Grp Volume(v), veh/h	5	573	73	58	266	270	58	0	244	101	0	66
Grp Sat Flow(s),veh/h/ln	1641	1777	1437	1641	1777	1784	1641	0	1633	1641	0	1828
Q Serve(g_s), s	0.2	9.6	1.1	3.4	7.9	8.1	3.0	0.0	14.1	6.0	0.0	3.4
Cycle Q Clear(g_c), s	0.2	9.6	1.1	3.4	7.9	8.1	3.0	0.0	14.1	6.0	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.70	1.00		0.11
Lane Grp Cap(c), veh/h	394	1786	722	86	560	562	304	0	326	139	0	182
V/C Ratio(X)	0.01	0.32	0.10	0.67	0.48	0.48	0.19	0.00	0.75	0.72	0.00	0.36
Avail Cap(c_a), veh/h	394	1786	722	156	560	562	304	0	562	217	0	696
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.0	14.8	2.4	43.9	14.1	14.3	34.4	0.0	37.9	44.6	0.0	42.1
Incr Delay (d2), s/veh	0.0	0.5	0.3	7.4	2.4	2.4	0.3	0.0	3.4	6.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.5	0.8	1.4	2.7	2.8	1.1	0.0	5.6	2.6	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.0	15.2	2.7	51.3	16.5	16.8	34.7	0.0	41.4	51.5	0.0	43.3
LnGrp LOS	C	B	A	D	B	B	C		D	D		D
Approach Vol, veh/h		651			594			302			167	
Approach Delay, s/veh		13.9			20.0			40.1			48.3	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	24.0	9.2	54.3	22.5	14.0	28.0	35.5				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	12.3	33.5	8.6	26.0	8.6	37.2	4.0	30.6				
Max Q Clear Time (g_c+I1), s	8.0	16.1	5.4	11.6	5.0	5.4	2.2	10.1				
Green Ext Time (p_c), s	0.1	0.8	0.0	2.3	0.0	0.2	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			24.0									
HCM 6th LOS			C									

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	578	117	76	492	23	133	129	61	67	194	88
Future Volume (vph)	63	578	117	76	492	23	133	129	61	67	194	88
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.975			0.993				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3440	0	1630	3510	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3440	0	1630	3510	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			5				128			128
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	68	628	127	83	535	25	145	140	66	73	211	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	755	0	83	560	0	145	140	66	73	211	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	14.0	34.2		14.0	34.2		20.0	35.4	35.4	16.4	31.8	31.8
Total Split (%)	14.0%	34.2%		14.0%	34.2%		20.0%	35.4%	35.4%	16.4%	31.8%	31.8%
Maximum Green (s)	9.1	29.3		9.1	29.3		15.1	30.5	30.5	11.5	26.9	26.9
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	9.6	27.0		10.2	27.5		15.0	16.0	16.0	33.1	34.0	34.0
Actuated g/C Ratio	0.10	0.27		0.10	0.28		0.15	0.16	0.16	0.33	0.34	0.34
v/c Ratio	0.44	0.80		0.50	0.58		0.59	0.25	0.20	0.14	0.18	0.17
Control Delay (s/veh)	39.4	36.1		53.0	33.1		38.2	25.6	3.9	32.6	26.8	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	39.4	36.1		53.0	33.1		38.2	25.6	3.9	32.6	26.8	3.2
LOS	D	D		D	C		D	C	A	C	C	A
Approach Delay (s/veh)		36.4			35.7			26.7			21.9	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88 (88%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 32.1

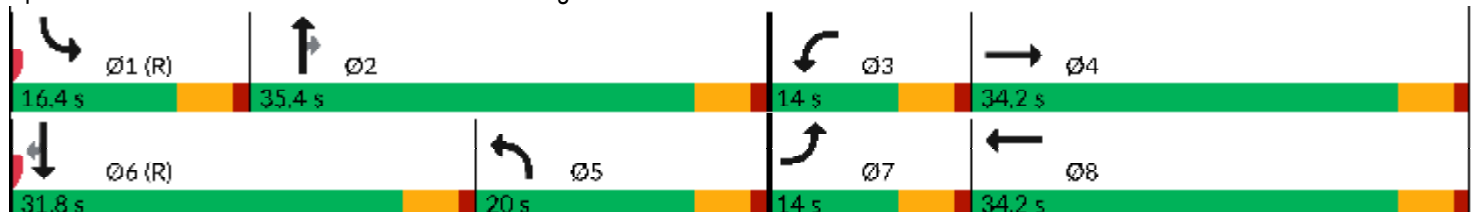
Intersection LOS: C

Intersection Capacity Utilization 67.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

AM Existing+Project

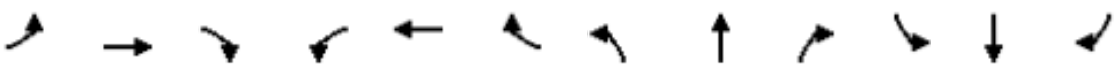
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	578	117	76	492	23	133	129	61	67	194	88
Future Volume (veh/h)	63	578	117	76	492	23	133	129	61	67	194	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	68	628	127	83	535	25	145	140	66	73	211	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	769	155	118	941	44	638	610	245	549	417	166
Arrive On Green	0.02	0.09	0.08	0.07	0.27	0.26	0.13	0.06	0.06	0.33	0.12	0.12
Sat Flow, veh/h	1641	2934	592	1641	3451	161	1641	3554	1426	1641	3554	1419
Grp Volume(v), veh/h	68	380	375	83	275	285	145	140	66	73	211	96
Grp Sat Flow(s),veh/h/ln	1641	1777	1750	1641	1777	1835	1641	1777	1426	1641	1777	1419
Q Serve(g_s), s	4.1	21.0	21.1	4.9	13.3	13.4	7.9	3.8	4.4	3.1	5.6	5.3
Cycle Q Clear(g_c), s	4.1	21.0	21.1	4.9	13.3	13.4	7.9	3.8	4.4	3.1	5.6	5.3
Prop In Lane	1.00		0.34	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	466	459	118	485	501	638	610	245	549	417	166
V/C Ratio(X)	0.68	0.82	0.82	0.70	0.57	0.57	0.23	0.23	0.27	0.13	0.51	0.58
Avail Cap(c_a), veh/h	164	537	528	164	537	554	638	1116	448	549	988	394
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.97	0.97	0.97	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	43.3	43.4	45.4	31.3	31.3	30.1	40.8	41.2	23.2	41.4	28.1
Incr Delay (d2), s/veh	7.3	8.0	8.3	7.5	1.1	1.1	0.2	0.2	0.6	0.1	4.3	13.8
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	1.8	10.9	10.8	2.1	5.4	5.6	3.1	1.6	1.5	1.1	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.4	51.3	51.7	52.9	32.4	32.4	30.3	41.0	41.7	23.3	45.8	41.8
LnGrp LOS	E	D	D	D	C	C	C	D	D	C	D	D
Approach Vol, veh/h	823			643			351			380		
Approach Delay, s/veh	51.8			35.1			36.7			40.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	37.4	21.2	11.2	30.2	42.9	15.7	10.1	31.3				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	11.5	30.5	9.1	29.3	15.1	26.9	9.1	29.3				
Max Q Clear Time (g_c+I1), s	5.1	6.4	6.9	23.1	9.9	7.6	6.1	15.4				
Green Ext Time (p_c), s	0.1	0.7	0.0	1.6	0.2	1.1	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	42.5											
HCM 6th LOS	D											

Lanes, Volumes, Timings
6: S Vineland Ave & Whitesbridge Ave

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	560	108	23	487	2	100	33	67	4	15	6
Future Volume (vph)	4	560	108	23	487	2	100	33	67	4	15	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00			0.99			0.99	
Frt			0.850		0.999			0.900			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1655	0	1630	1767	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1407	1630	3535	0	1630	1655	0	1630	1767	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151					73			7	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	4	609	117	25	529	2	109	36	73	4	16	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	609	117	25	531	0	109	109	0	4	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	11.0	45.4	45.4	13.0	47.4		26.0	50.6		11.0	35.6	
Total Split (%)	9.2%	37.8%	37.8%	10.8%	39.5%		21.7%	42.2%		9.2%	29.7%	
Maximum Green (s)	6.1	40.5	40.5	8.1	42.5		21.1	45.7		6.1	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.8	73.9	73.9	8.1	79.4		14.2	28.1		6.7	12.1	
Actuated g/C Ratio	0.06	0.62	0.62	0.07	0.66		0.12	0.23		0.06	0.10	
v/c Ratio	0.04	0.28	0.13	0.23	0.23		0.57	0.25		0.04	0.13	
Control Delay (s/veh)	54.3	14.6	2.1	57.7	11.7		60.7	13.8		54.5	34.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	54.3	14.6	2.1	57.7	11.7		60.7	13.8		54.5	34.9	
LOS	D	B	A	E	B		E	B		D	C	
Approach Delay (s/veh)		12.8			13.7			37.3			37.8	
Approach LOS		B			B			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay (s/veh): 17.1

Intersection LOS: B

Intersection Capacity Utilization 44.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

AM Existing+Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	560	108	23	487	2	100	33	67	4	15	6
Future Volume (veh/h)	4	560	108	23	487	2	100	33	67	4	15	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.96
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	4	609	117	25	529	2	109	36	73	4	16	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	1226	489	587	2508	9	145	83	167	19	92	40
Arrive On Green	0.01	0.34	0.34	0.36	0.69	0.68	0.09	0.15	0.15	0.01	0.08	0.07
Sat Flow, veh/h	1641	3554	1417	1641	3631	14	1641	541	1098	1641	1216	532
Grp Volume(v), veh/h	4	609	117	25	259	272	109	0	109	4	0	23
Grp Sat Flow(s),veh/h/ln	1641	1777	1417	1641	1777	1867	1641	0	1639	1641	0	1749
Q Serve(g_s), s	0.3	16.3	5.2	1.2	6.3	6.3	7.8	0.0	7.3	0.3	0.0	1.5
Cycle Q Clear(g_c), s	0.3	16.3	5.2	1.2	6.3	6.3	7.8	0.0	7.3	0.3	0.0	1.5
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.67	1.00		0.30
Lane Grp Cap(c), veh/h	19	1226	489	587	1228	1290	145	0	250	19	0	132
V/C Ratio(X)	0.21	0.50	0.24	0.04	0.21	0.21	0.75	0.00	0.44	0.21	0.00	0.17
Avail Cap(c_a), veh/h	96	1226	489	587	1228	1290	301	0	637	96	0	460
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)	0.65	0.65	0.65	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.8	31.1	15.4	25.2	6.7	6.7	53.4	0.0	46.4	58.8	0.0	52.1
Incr Delay (d2), s/veh	3.5	0.9	0.8	0.0	0.4	0.4	7.5	0.0	1.2	5.3	0.0	0.6
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	0.1	6.7	2.3	0.4	2.0	2.1	3.4	0.0	2.9	0.1	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.2	32.0	16.1	25.2	7.1	7.1	60.9	0.0	47.6	64.0	0.0	52.7
LnGrp LOS	E	C	B	C	A	A	E		D	E		D
Approach Vol, veh/h	730			556			218			27		
Approach Delay, s/veh	29.6			7.9			54.3			54.4		
Approach LOS	C			A			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	22.3	46.9	45.4	14.6	13.1	5.4	86.9				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	6.1	45.7	8.1	40.5	21.1	30.7	6.1	42.5				
Max Q Clear Time (g_c+I1), s	2.3	9.3	3.2	18.3	9.8	3.5	2.3	8.3				
Green Ext Time (p_c), s	0.0	0.4	0.0	3.0	0.2	0.0	0.0	1.9				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	25.7											
HCM 6th LOS	C											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	161	5	9	101	37	4	59	18	83	47	43
Future Volume (vph)	67	161	5	9	101	37	4	59	18	83	47	43
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.964			0.928	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3412	0	1630	3284	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3412	0	1630	3284	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	73	175	5	10	110	40	4	64	20	90	51	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	175	5	10	110	40	4	84	0	90	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 29.7%				ICU Level of Service A								
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

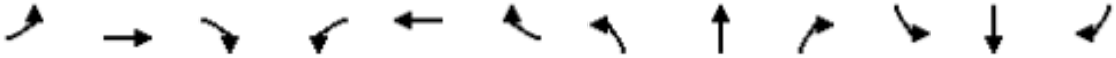
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	161	5	9	101	37	4	59	18	83	47	43
Future Vol, veh/h	67	161	5	9	101	37	4	59	18	83	47	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	175	5	10	110	40	4	64	20	90	51	47
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	10.4	9.5	9.2	9.6
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	52%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	48%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	39	38	67	161	5	9	101	37	83	31
LT Vol	4	0	0	67	0	0	9	0	0	83	0
Through Vol	0	39	20	0	161	0	0	101	0	0	31
RT Vol	0	0	18	0	0	5	0	0	37	0	0
Lane Flow Rate	4	43	41	73	175	5	10	110	40	90	34
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.008	0.073	0.066	0.127	0.28	0.008	0.018	0.181	0.059	0.162	0.056
Departure Headway (Hd)	6.664	6.164	5.83	6.259	5.759	5.059	6.441	5.941	5.241	6.447	5.947
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	538	581	615	576	628	712	557	605	684	558	603
Service Time	4.398	3.898	3.564	3.959	3.459	2.759	4.167	3.667	2.967	4.176	3.676
HCM Lane V/C Ratio	0.007	0.074	0.067	0.127	0.279	0.007	0.018	0.182	0.058	0.161	0.056
HCM Control Delay, s/veh	9.5	9.4	9	9.9	10.7	7.8	9.3	10	8.3	10.4	9
HCM Lane LOS	A	A	A	A	B	A	A	A	A	B	A
HCM 95th-tile Q	0	0.2	0.2	0.4	1.1	0	0.1	0.7	0.2	0.6	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	152	46	24	161	75	31	298	11	42	319	28
Future Volume (vph)	23	152	46	24	161	75	31	298	11	42	319	28
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.995			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3517	0	1630	3491	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1432	1630	3517	0	1630	3491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		4			9	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	25	165	50	26	175	82	34	324	12	46	347	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	165	50	26	175	82	34	336	0	46	377	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	13.0	39.0	39.0	13.0	39.0	39.0	13.0	34.0		14.0	35.0	
Total Split (%)	13.0%	39.0%	39.0%	13.0%	39.0%	39.0%	13.0%	34.0%		14.0%	35.0%	
Maximum Green (s)	8.1	34.1	34.1	8.1	34.1	34.1	8.1	29.1		9.1	30.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	8.0	17.4	17.4	8.1	17.5	17.5	8.5	60.4		9.2	61.0	
Actuated g/C Ratio	0.08	0.17	0.17	0.08	0.18	0.18	0.09	0.60		0.09	0.61	
v/c Ratio	0.19	0.51	0.13	0.20	0.54	0.21	0.25	0.16		0.31	0.18	
Control Delay (s/veh)	45.8	41.4	0.7	45.8	42.2	1.2	46.4	13.5		28.1	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	45.8	41.4	0.7	45.8	42.2	1.2	46.4	13.5		28.1	5.2	
LOS	D	D	A	D	D	A	D	B		C	A	
Approach Delay (s/veh)		33.3			30.7			16.6			7.7	
Approach LOS		C			C			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 2 (2%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay (s/veh): 19.8

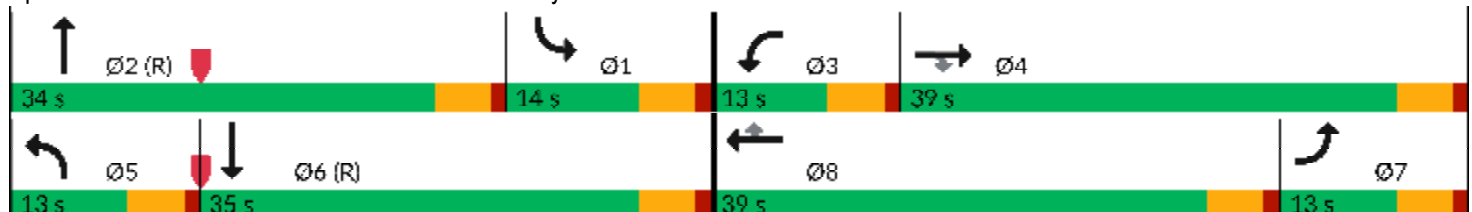
Intersection LOS: B

Intersection Capacity Utilization 50.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

AM Existing+Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	152	46	24	161	75	31	298	11	42	319	28
Future Volume (veh/h)	23	152	46	24	161	75	31	298	11	42	319	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.96	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	25	165	50	26	175	82	34	324	12	46	347	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	277	211	49	278	211	55	492	18	855	2079	179
Arrive On Green	0.03	0.15	0.15	0.03	0.15	0.15	0.03	0.14	0.13	1.00	1.00	1.00
Sat Flow, veh/h	1641	1870	1424	1641	1870	1424	1641	3488	129	1641	3307	284
Grp Volume(v), veh/h	25	165	50	26	175	82	34	164	172	46	185	192
Grp Sat Flow(s),veh/h/ln	1641	1870	1424	1641	1870	1424	1641	1777	1840	1641	1777	1814
Q Serve(g_s), s	1.5	8.2	3.1	1.6	8.8	5.2	2.0	8.8	8.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	8.2	3.1	1.6	8.8	5.2	2.0	8.8	8.8	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.16
Lane Grp Cap(c), veh/h	48	277	211	49	278	211	55	251	259	855	1117	1140
V/C Ratio(X)	0.52	0.60	0.24	0.54	0.63	0.39	0.61	0.66	0.66	0.05	0.17	0.17
Avail Cap(c_a), veh/h	148	655	498	148	655	498	148	533	552	855	1117	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	47.9	39.8	37.6	47.8	40.0	38.5	47.7	40.7	40.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	8.7	2.0	0.6	8.9	2.3	1.2	10.5	12.7	12.5	0.0	0.3	0.3
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	3.7	1.1	0.7	4.0	1.8	1.0	4.5	4.7	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	56.5	41.9	38.2	56.7	42.3	39.6	58.1	53.3	53.2	0.0	0.3	0.3
LnGrp LOS	E	D	D	E	D	D	E	D	D	A	A	A
Approach Vol, veh/h	240			283			370			423		
Approach Delay, s/veh	42.6			42.9			53.7			0.3		
Approach LOS	D			D			D			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	56.1	18.1	7.0	18.8	7.4	66.9	6.9	18.9				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	9.1	29.1	8.1	34.1	8.1	30.1	8.1	34.1				
Max Q Clear Time (g_c+I1), s	2.0	10.8	3.6	10.2	4.0	2.0	3.5	10.8				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.7	0.0	1.3	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	32.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

AM Existing+Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	114	47	20	91	43	42	148	23	41	205	19
Future Volume (vph)	30	114	47	20	91	43	42	148	23	41	205	19
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.962			0.985			0.987	
Flt Protected		0.992			0.993			0.990		0.950		
Satd. Flow (prot)	0	1787	0	0	1779	0	0	1816	0	1630	1839	0
Flt Permitted		0.992			0.993			0.990		0.950		
Satd. Flow (perm)	0	1787	0	0	1779	0	0	1816	0	1630	1839	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	33	124	51	22	99	47	46	161	25	45	223	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	168	0	0	232	0	45	244	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	49.1%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection

Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	114	47	20	91	43	42	148	23	41	205	19
Future Vol, veh/h	30	114	47	20	91	43	42	148	23	41	205	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	124	51	22	99	47	46	161	25	45	223	21
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	11.3	10.7	11.7	12.1
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	16%	13%	100%	0%
Vol Thru, %	69%	60%	59%	0%	92%
Vol Right, %	11%	25%	28%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	191	154	41	224
LT Vol	42	30	20	41	0
Through Vol	148	114	91	0	205
RT Vol	23	47	43	0	19
Lane Flow Rate	232	208	167	45	243
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.358	0.321	0.261	0.08	0.397
Departure Headway (Hd)	5.571	5.571	5.622	6.439	5.872
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	644	644	636	556	614
Service Time	3.618	3.62	3.676	4.182	3.614
HCM Lane V/C Ratio	0.36	0.323	0.263	0.081	0.396
HCM Control Delay, s/veh	11.7	11.3	10.7	9.7	12.5
HCM Lane LOS	B	B	B	A	B
HCM 95th-tile Q	1.6	1.4	1	0.3	1.9

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	4	0	0	0	1	120	0	1	24	0
Future Volume (vph)	0	1	4	0	0	0	1	120	0	1	24	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892											
Flt Protected											0.998	
Satd. Flow (prot)	0	1662	0	0	1863	0	0	1863	0	0	1859	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1662	0	0	1863	0	0	1863	0	0	1859	0
Link Speed (mph)	55				55				55			
Link Distance (ft)	588				2659				1363			
Travel Time (s)	7.3				33.0				16.9			
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
Adj. Flow (vph)	0	1	4	0	0	0	1	130	0	1	26	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	0	0	0	131	0	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0			
Link Offset(ft)	0				0				0			
Crosswalk Width(ft)	16				16				16			
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 16.7% ICU Level of Service A												
Analysis Period (min) 15												

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	4	0	0	0	1	120	0	1	24	0
Future Vol, veh/h	0	1	4	0	0	0	1	120	0	1	24	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	4	0	0	0	1	130	0	1	26	0
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, s/veh	6.8	0	7.6	7.2
HCM LOS	A	-	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	0%	4%
Vol Thru, %	99%	20%	100%	96%
Vol Right, %	0%	80%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	5	0	25
LT Vol	1	0	0	1
Through Vol	120	1	0	24
RT Vol	0	4	0	0
Lane Flow Rate	132	5	0	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0.145	0.006	0	0.031
Departure Headway (Hd)	3.966	3.726	4.213	4.05
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	908	949	0	884
Service Time	1.973	1.793	2.281	2.075
HCM Lane V/C Ratio	0.145	0.005	0	0.031
HCM Control Delay, s/veh	7.6	6.8	7.3	7.2
HCM Lane LOS	A	A	N	A
HCM 95th-tile Q	0.5	0	0	0.1

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	1	50	0	0	32	0
Future Volume (vph)	0	0	0	0	0	0	1	50	0	0	32	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected								0.999				
Satd. Flow (prot)	0	1863	0	0	1863	0	0	1861	0	0	1863	0
Flt Permitted								0.999				
Satd. Flow (perm)	0	1863	0	0	1863	0	0	1861	0	0	1863	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2659			2643			2647			315	
Travel Time (s)		33.0			32.8			32.8			3.9	
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
Adj. Flow (vph)	0	0	0	0	0	0	1	54	0	0	35	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	55	0	0	35	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 6.8%	ICU Level of Service A											
Analysis Period (min) 15												

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	0	0	0	0	0	0	1	50	0	0	32	0
Future Vol, veh/h	0	0	0	0	0	0	1	50	0	0	32	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	-	-	-	-	-	-	-	-	-	-	-	-
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	0	0	0	0	0	0	1	54	0	0	35	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	1	0	0	20	2	1	29	2	1
Stage 1	-	-	-	-	-	-	1	1	-	1	1	-
Stage 2	-	-	-	-	-	-	19	1	-	28	1	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1622	-	-	1622	-	-	993	894	1084	980	894	1084
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	1000	895	-	989	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1622	-	-	963	894	1084	935	894	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	963	894	-	935	894	-
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	961	895	-	929	895	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	0	9.3	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	895	1622	-	-	1622	-	-	894
HCM Lane V/C Ratio	0.062	-	-	-	-	-	-	0.039
HCM Control Delay (s/veh)	9.3	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q (veh)	0.2	0	-	-	0	-	-	0.1

Lanes, Volumes, Timings

3: S Madera Ave & Nielsen Ave

AM Future
05/23/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	282	549	2
Future Volume (vph)	0	1	0	282	549	2
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1484	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1484	0	0	1863	1863	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1	0	307	597	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	307	599	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15	9		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 39.0%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	282	549	2
Future Vol, veh/h	0	1	0	282	549	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	0	1	0	307	597	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	905	598	599
Stage 1	598	-	-
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	307	502	978
Stage 1	549	-	-
Stage 2	746	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	307	502	978
Mov Cap-2 Maneuver	307	-	-
Stage 1	549	-	-
Stage 2	746	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	978	-	502	-	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s/veh)	0	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q (veh)	0	-	0	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	659	21	91	664	3	19	46	175	10	18	2
Future Volume (vph)	3	659	21	91	664	3	19	46	175	10	18	2
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.999			0.881			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1618	0	1630	1834	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3535	0	1630	1618	0	1630	1834	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128					190			2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	3	716	23	99	722	3	21	50	190	11	20	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	716	23	99	725	0	21	240	0	11	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	9.0	35.5	35.5	17.1	43.6		9.8	38.4		9.0	37.6	
Total Split (%)	9.0%	35.5%	35.5%	17.1%	43.6%		9.8%	38.4%		9.0%	37.6%	
Maximum Green (s)	4.1	30.6	30.6	12.2	38.7		4.9	33.5		4.1	32.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	5.0	61.5	61.5	11.5	72.8		7.1	15.6		6.5	12.8	
Actuated g/C Ratio	0.05	0.62	0.62	0.12	0.73		0.07	0.16		0.07	0.13	
v/c Ratio	0.04	0.33	0.02	0.53	0.28		0.18	0.58		0.10	0.09	
Control Delay (s/veh)	46.3	14.2	0.0	34.9	7.0		47.6	13.9		46.8	31.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	46.3	14.2	0.0	34.9	7.0		47.6	13.9		46.8	31.8	
LOS	D	B	A	C	A		D	B		D	C	
Approach Delay (s/veh)		13.9			10.3			16.6			36.8	
Approach LOS		B			B			B			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 23 (23%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay (s/veh): 13.1

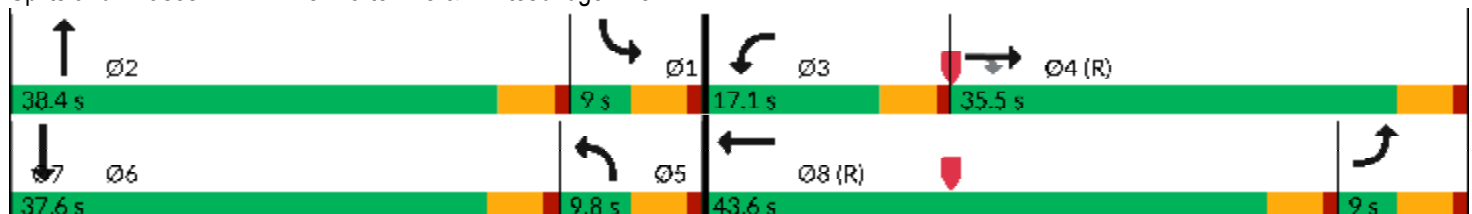
Intersection LOS: B

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	659	21	91	664	3	19	46	175	10	18	2
Future Volume (veh/h)	3	659	21	91	664	3	19	46	175	10	18	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.96
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	3	716	23	99	722	3	21	50	190	11	20	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	1907	771	138	1437	6	219	67	254	32	143	14
Arrive On Green	0.22	0.54	0.54	0.06	0.27	0.26	0.13	0.20	0.19	0.02	0.09	0.08
Sat Flow, veh/h	1641	3554	1437	1641	3629	15	1641	335	1273	1641	1666	167
Grp Volume(v), veh/h	3	716	23	99	353	372	21	0	240	11	0	22
Grp Sat Flow(s),veh/h/ln	1641	1777	1437	1641	1777	1867	1641	0	1608	1641	0	1833
Q Serve(g_s), s	0.1	11.7	0.4	5.9	16.9	16.9	1.1	0.0	14.1	0.7	0.0	1.1
Cycle Q Clear(g_c), s	0.1	11.7	0.4	5.9	16.9	16.9	1.1	0.0	14.1	0.7	0.0	1.1
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.79	1.00		0.09
Lane Grp Cap(c), veh/h	369	1907	771	138	704	739	219	0	321	32	0	158
V/C Ratio(X)	0.01	0.38	0.03	0.72	0.50	0.50	0.10	0.00	0.75	0.34	0.00	0.14
Avail Cap(c_a), veh/h	369	1907	771	215	704	739	219	0	553	82	0	616
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	13.4	2.7	46.0	28.4	28.4	38.0	0.0	38.0	48.4	0.0	42.3
Incr Delay (d2), s/veh	0.0	0.6	0.1	4.4	1.6	1.5	0.2	0.0	3.5	6.2	0.0	0.4
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	0.1	4.1	0.2	2.5	7.5	7.9	0.4	0.0	5.5	0.3	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.1	14.0	2.8	50.4	30.0	29.9	38.2	0.0	41.5	54.6	0.0	42.7
LnGrp LOS	C	B	A	D	C	C	D		D	D		D
Approach Vol, veh/h	742			824			261			33		
Approach Delay, s/veh	13.7			32.4			41.2			46.7		
Approach LOS	B			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	24.0	12.4	57.7	17.3	12.6	26.5	43.6				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.1	33.5	12.2	30.6	4.9	32.7	4.1	38.7				
Max Q Clear Time (g_c+I1), s	2.7	16.1	7.9	13.7	3.1	3.1	2.1	18.9				
Green Ext Time (p_c), s	0.0	0.8	0.1	2.9	0.0	0.0	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			26.4									
HCM 6th LOS			C									

Lanes, Volumes, Timings

5: S Madera Ave & Whitesbridge Ave

AM Future

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	699	82	131	734	40	113	157	74	82	237	107
Future Volume (vph)	93	699	82	131	734	40	113	157	74	82	237	107
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.984			0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3476	0	1630	3505	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3476	0	1630	3505	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			6				181			181
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	101	760	89	142	798	43	123	171	80	89	258	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	849	0	142	841	0	123	171	80	89	258	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings

5: S Madera Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	13.8	34.1		18.0	38.3		16.0	32.9	32.9	15.0	31.9	31.9
Total Split (%)	13.8%	34.1%		18.0%	38.3%		16.0%	32.9%	32.9%	15.0%	31.9%	31.9%
Maximum Green (s)	8.9	29.2		13.1	33.4		11.1	28.0	28.0	10.1	27.0	27.0
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	12.7	29.1		13.6	30.1		12.5	15.9	15.9	25.3	28.7	28.7
Actuated g/C Ratio	0.13	0.29		0.14	0.30		0.13	0.16	0.16	0.25	0.29	0.29
v/c Ratio	0.49	0.83		0.64	0.80		0.61	0.30	0.21	0.22	0.25	0.22
Control Delay (s/veh)	41.8	33.7		48.3	30.2		41.8	36.9	7.1	36.6	30.0	1.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	41.8	33.7		48.3	30.2		41.8	36.9	7.1	36.6	30.0	1.7
LOS	D	C		D	C		D	D	A	D	C	A
Approach Delay (s/veh)		34.6			32.8			32.1			24.2	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 20 (20%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay (s/veh): 31.9

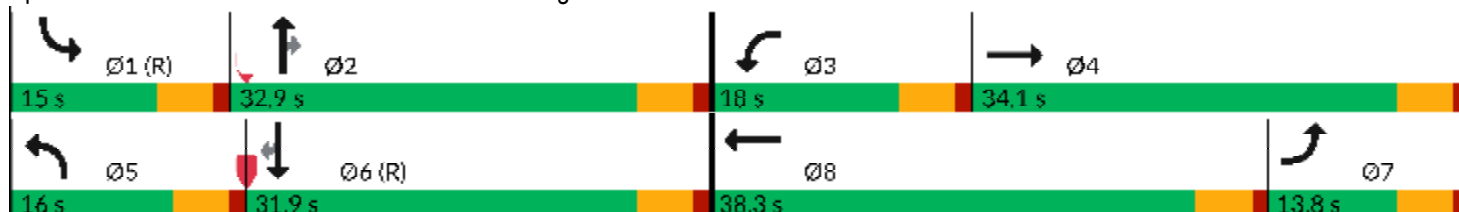
Intersection LOS: C

Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

AM Future

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	699	82	131	734	40	113	157	74	82	237	107
Future Volume (veh/h)	93	699	82	131	734	40	113	157	74	82	237	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	101	760	89	142	798	43	123	171	80	89	258	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	189	894	105	184	945	51	165	538	216	487	1236	499
Arrive On Green	0.04	0.09	0.09	0.11	0.28	0.27	0.03	0.05	0.05	0.30	0.35	0.35
Sat Flow, veh/h	1641	3197	374	1641	3422	184	1641	3554	1424	1641	3554	1434
Grp Volume(v), veh/h	101	422	427	142	414	427	123	171	80	89	258	116
Grp Sat Flow(s),veh/h/ln	1641	1777	1794	1641	1777	1830	1641	1777	1424	1641	1777	1434
Q Serve(g_s), s	6.0	23.4	23.4	8.4	22.0	22.0	7.4	4.6	5.4	4.0	5.1	3.9
Cycle Q Clear(g_c), s	6.0	23.4	23.4	8.4	22.0	22.0	7.4	4.6	5.4	4.0	5.1	3.9
Prop In Lane	1.00		0.21	1.00		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	189	497	502	184	491	505	165	538	216	487	1236	499
V/C Ratio(X)	0.53	0.85	0.85	0.77	0.84	0.84	0.74	0.32	0.37	0.18	0.21	0.23
Avail Cap(c_a), veh/h	189	535	540	230	609	628	197	1027	412	487	1236	499
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	43.3	43.4	43.2	34.2	34.2	47.1	42.5	42.9	26.1	22.9	10.5
Incr Delay (d2), s/veh	2.7	11.2	11.2	11.4	8.4	8.2	11.6	0.3	1.0	0.2	0.4	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	2.6	12.5	12.6	3.8	9.8	10.1	3.6	2.0	1.9	1.5	2.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.2	54.5	54.5	54.6	42.5	42.4	58.7	42.8	43.9	26.3	23.3	11.6
LnGrp LOS	D	D	D	D	D	D	E	D	D	C	C	B
Approach Vol, veh/h	950			983			374			463		
Approach Delay, s/veh	53.9			44.2			48.3			21.0		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.7	19.2	15.2	32.0	14.1	38.8	15.5	31.6				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	10.1	28.0	13.1	29.2	11.1	27.0	8.9	33.4				
Max Q Clear Time (g_c+I1), s	6.0	7.4	10.4	25.4	9.4	7.1	8.0	24.0				
Green Ext Time (p_c), s	0.1	0.9	0.1	1.3	0.1	1.4	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	44.2											
HCM 6th LOS	D											

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

AM Future

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	896	91	34	688	3	84	43	88	5	20	8
Future Volume (vph)	7	896	91	34	688	3	84	43	88	5	20	8
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00			0.99			0.99	
Frt			0.850		0.999			0.899			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1654	0	1630	1771	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1410	1630	3535	0	1630	1654	0	1630	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181					96			9	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	8	974	99	37	748	3	91	47	96	5	22	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	974	99	37	751	0	91	143	0	5	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	8.9	39.4	39.4	10.0	40.5		15.0	41.7		8.9	35.6	
Total Split (%)	8.9%	39.4%	39.4%	10.0%	40.5%		15.0%	41.7%		8.9%	35.6%	
Maximum Green (s)	4.0	34.5	34.5	5.1	35.6		10.1	36.8		4.0	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.4	61.4	61.4	6.0	65.6		10.7	22.8		4.9	12.2	
Actuated g/C Ratio	0.06	0.61	0.61	0.06	0.66		0.11	0.23		0.05	0.12	
v/c Ratio	0.08	0.45	0.11	0.38	0.32		0.52	0.32		0.06	0.14	
Control Delay (s/veh)	59.9	5.4	0.4	56.9	11.5		52.8	11.8		47.2	27.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	59.9	5.4	0.4	56.9	11.5		52.8	11.8		47.2	27.7	
LOS	E	A	A	E	B		D	B		D	C	
Approach Delay (s/veh)		5.3			13.6			27.8			30.4	
Approach LOS		A			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 18 (18%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay (s/veh): 11.3

Intersection LOS: B

Intersection Capacity Utilization 50.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

AM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	896	91	34	688	3	84	43	88	5	20	8
Future Volume (veh/h)	7	896	91	34	688	3	84	43	88	5	20	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.96
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	8	974	99	37	748	3	91	47	96	5	22	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	28	1258	502	532	2399	10	127	80	163	23	105	43
Arrive On Green	0.01	0.12	0.12	0.32	0.66	0.65	0.08	0.15	0.14	0.01	0.08	0.08
Sat Flow, veh/h	1641	3554	1418	1641	3630	15	1641	538	1100	1641	1246	510
Grp Volume(v), veh/h	8	974	99	37	366	385	91	0	143	5	0	31
Grp Sat Flow(s),veh/h/ln	1641	1777	1418	1641	1777	1867	1641	0	1638	1641	0	1755
Q Serve(g_s), s	0.5	26.6	6.3	1.6	8.8	8.8	5.4	0.0	8.2	0.3	0.0	1.7
Cycle Q Clear(g_c), s	0.5	26.6	6.3	1.6	8.8	8.8	5.4	0.0	8.2	0.3	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.67	1.00		0.29
Lane Grp Cap(c), veh/h	28	1258	502	532	1175	1234	127	0	242	23	0	148
V/C Ratio(X)	0.29	0.77	0.20	0.07	0.31	0.31	0.71	0.00	0.59	0.21	0.00	0.21
Avail Cap(c_a), veh/h	80	1258	502	532	1175	1234	180	0	618	80	0	555
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.61	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.1	40.3	31.3	23.4	7.2	7.2	45.0	0.0	40.1	48.7	0.0	42.8
Incr Delay (d2), s/veh	3.4	2.9	0.5	0.1	0.7	0.7	7.4	0.0	2.3	4.5	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	0.2	12.9	2.2	0.6	2.7	2.8	2.3	0.0	3.3	0.1	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.5	43.2	31.9	23.4	7.9	7.9	52.5	0.0	42.4	53.3	0.0	43.5
LnGrp LOS	D	D	C	C	A	A	D		D	D		D
Approach Vol, veh/h	1081				788				234		36	
Approach Delay, s/veh	42.2				8.6				46.3		44.9	
Approach LOS	D				A				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	18.8	36.4	39.4	11.8	12.4	5.7	70.1				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	36.8	5.1	34.5	10.1	30.7	4.0	35.6				
Max Q Clear Time (g_c+I1), s	2.3	10.2	3.6	28.6	7.4	3.7	2.5	10.8				
Green Ext Time (p_c), s	0.0	0.5	0.0	2.5	0.0	0.1	0.0	2.7				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			30.3									
HCM 6th LOS			C									

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	291	9	13	150	13	5	60	22	48	38	45
Future Volume (vph)	114	291	9	13	150	13	5	60	22	48	38	45
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.960			0.918	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3398	0	1630	3249	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3398	0	1630	3249	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	124	316	10	14	163	14	5	65	24	52	41	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	316	10	14	163	14	5	89	0	52	90	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	38.8%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

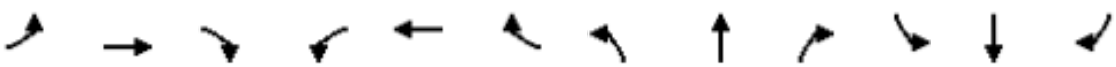
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	114	291	9	13	150	13	5	60	22	48	38	45
Future Vol, veh/h	114	291	9	13	150	13	5	60	22	48	38	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	124	316	10	14	163	14	5	65	24	52	41	49
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	13.2	11.1	9.8	10
HCM LOS	B	B	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	48%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	52%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	40	42	114	291	9	13	150	13	48	25
LT Vol	5	0	0	114	0	0	13	0	0	48	0
Through Vol	0	40	20	0	291	0	0	150	0	0	25
RT Vol	0	0	22	0	0	9	0	0	13	0	0
Lane Flow Rate	5	43	46	124	316	10	14	163	14	52	28
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.011	0.081	0.08	0.216	0.508	0.014	0.027	0.285	0.022	0.103	0.05
Departure Headway (Hd)	7.208	6.708	6.341	6.284	5.784	5.084	6.785	6.285	5.585	7.098	6.598
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	496	533	564	572	623	704	528	572	640	505	542
Service Time	4.954	4.454	4.088	4.015	3.515	2.815	4.523	4.023	3.323	4.84	4.34
HCM Lane V/C Ratio	0.01	0.081	0.082	0.217	0.507	0.014	0.027	0.285	0.022	0.103	0.052
HCM Control Delay, s/veh	10	10	9.6	10.7	14.4	7.9	9.7	11.5	8.4	10.7	9.7
HCM Lane LOS	A	A	A	B	B	A	A	B	A	B	A
HCM 95th-tile Q	0	0.3	0.3	0.8	2.9	0	0.1	1.2	0.1	0.3	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	171	67	36	204	101	37	345	14	39	350	34
Future Volume (vph)	34	171	67	36	204	101	37	345	14	39	350	34
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.994			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3513	0	1630	3487	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1432	1630	3513	0	1630	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			128		4			11	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	37	186	73	39	222	110	40	375	15	42	380	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	186	73	39	222	110	40	390	0	42	417	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	13.0	39.0	39.0	13.0	39.0	39.0	13.0	35.0		13.0	35.0	
Total Split (%)	13.0%	39.0%	39.0%	13.0%	39.0%	39.0%	13.0%	35.0%		13.0%	35.0%	
Maximum Green (s)	8.1	34.1	34.1	8.1	34.1	34.1	8.1	30.1		8.1	30.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	8.7	19.3	19.3	8.8	19.4	19.4	8.8	55.4		9.3	55.9	
Actuated g/C Ratio	0.09	0.19	0.19	0.09	0.19	0.19	0.09	0.55		0.09	0.56	
v/c Ratio	0.26	0.52	0.19	0.27	0.62	0.29	0.28	0.20		0.28	0.21	
Control Delay (s/veh)	46.6	40.1	1.9	46.6	43.3	5.7	46.8	16.3		40.9	8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	46.6	40.1	1.9	46.6	43.3	5.7	46.8	16.3		40.9	8.4	
LOS	D	D	A	D	D	A	D	B		D	A	
Approach Delay (s/veh)		31.5			32.5			19.2			11.4	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 74 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay (s/veh): 22.4

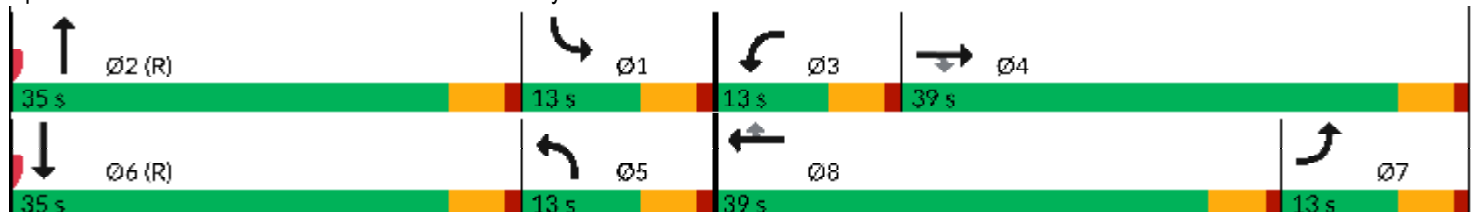
Intersection LOS: C

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

AM Future
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	171	67	36	204	101	37	345	14	39	350	34
Future Volume (veh/h)	34	171	67	36	204	101	37	345	14	39	350	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.96	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	37	186	73	39	222	110	40	375	15	42	380	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	318	242	62	321	244	761	539	21	783	550	53
Arrive On Green	0.04	0.17	0.17	0.04	0.17	0.17	0.46	0.15	0.15	0.16	0.06	0.05
Sat Flow, veh/h	1641	1870	1426	1641	1870	1426	1641	3476	139	1641	3265	316
Grp Volume(v), veh/h	37	186	73	39	222	110	40	191	199	42	206	211
Grp Sat Flow(s),veh/h/ln	1641	1870	1426	1641	1870	1426	1641	1777	1838	1641	1777	1804
Q Serve(g_s), s	2.2	9.2	1.4	2.3	11.2	6.9	1.3	10.2	10.3	2.2	11.4	11.5
Cycle Q Clear(g_c), s	2.2	9.2	1.4	2.3	11.2	6.9	1.3	10.2	10.3	2.2	11.4	11.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.18
Lane Grp Cap(c), veh/h	59	318	242	62	321	244	761	275	285	783	299	304
V/C Ratio(X)	0.62	0.59	0.30	0.63	0.69	0.45	0.05	0.69	0.70	0.05	0.69	0.70
Avail Cap(c_a), veh/h	148	655	499	148	655	499	761	551	570	783	551	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	47.5	38.3	3.8	47.4	39.0	37.2	14.7	40.0	40.1	22.9	44.6	44.7
Incr Delay (d2), s/veh	10.2	1.7	0.7	10.0	2.7	1.3	0.0	13.5	13.3	0.0	11.4	11.6
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	1.0	4.1	1.4	1.1	5.0	2.4	0.5	5.2	5.4	0.7	6.1	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.7	40.0	4.5	57.4	41.6	38.5	14.8	53.5	53.4	23.0	56.0	56.3
LnGrp LOS	E	D	A	E	D	D	B	D	D	C	E	E
Approach Vol, veh/h	296			371			430			459		
Approach Delay, s/veh	33.4			42.4			49.8			53.1		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51.7	19.5	7.8	21.0	50.4	20.8	7.6	21.1				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	8.1	30.1	8.1	34.1	8.1	30.1	8.1	34.1				
Max Q Clear Time (g_c+I1), s	4.2	12.3	4.3	11.2	3.3	13.5	4.2	13.2				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.8	0.0	1.3	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh			45.9									
HCM 6th LOS			D									

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

AM Future
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	123	55	36	128	78	43	150	28	54	220	25
Future Volume (vph)	45	123	55	36	128	78	43	150	28	54	220	25
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.956			0.983			0.985	
Flt Protected		0.990			0.993			0.990		0.950		
Satd. Flow (prot)	0	1783	0	0	1768	0	0	1813	0	1630	1835	0
Flt Permitted		0.990			0.993			0.990		0.950		
Satd. Flow (perm)	0	1783	0	0	1768	0	0	1813	0	1630	1835	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	49	134	60	39	139	85	47	163	30	59	239	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	243	0	0	263	0	0	240	0	59	266	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 53.9% ICU Level of Service A												
Analysis Period (min) 15												

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	123	55	36	128	78	43	150	28	54	220	25
Future Vol, veh/h	45	123	55	36	128	78	43	150	28	54	220	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	134	60	39	139	85	47	163	30	59	239	27
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	13.5	13.8	13.8	14.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	19%	20%	15%	100%	0%
Vol Thru, %	68%	55%	53%	0%	90%
Vol Right, %	13%	25%	32%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	221	223	242	54	245
LT Vol	43	45	36	54	0
Through Vol	150	123	128	0	220
RT Vol	28	55	78	0	25
Lane Flow Rate	240	242	263	59	266
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.418	0.414	0.442	0.116	0.483
Departure Headway (Hd)	6.264	6.147	6.05	7.106	6.523
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	574	584	594	508	557
Service Time	4.31	4.194	4.096	4.806	4.223
HCM Lane V/C Ratio	0.418	0.414	0.443	0.116	0.478
HCM Control Delay, s/veh	13.8	13.5	13.8	10.7	15.2
HCM Lane LOS	B	B	B	B	C
HCM 95th-tile Q	2.1	2	2.3	0.4	2.6

Lanes, Volumes, Timings
1: Siskiyou Ave & Nielsen Ave

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	3	4	0	2	0	1	120	0	1	24	0
Future Volume (vph)	0	3	4	0	2	0	1	120	0	1	24	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.923											
Flt Protected											0.998	
Satd. Flow (prot)	0	1719	0	0	1863	0	0	1863	0	0	1859	0
Flt Permitted											0.998	
Satd. Flow (perm)	0	1719	0	0	1863	0	0	1863	0	0	1859	0
Link Speed (mph)	55				55				55			
Link Distance (ft)	588				2659				1363			
Travel Time (s)	7.3				33.0				16.9			
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
Adj. Flow (vph)	0	3	4	0	2	0	1	130	0	1	26	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	7	0	0	2	0	0	131	0	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0			
Link Offset(ft)	0				0				0			
Crosswalk Width(ft)	16				16				16			
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	16.7%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	4	0	2	0	1	120	0	1	24	0
Future Vol, veh/h	0	3	4	0	2	0	1	120	0	1	24	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	4	0	2	0	1	130	0	1	26	0
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, s/veh	7	7.3	7.7	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	0%	4%
Vol Thru, %	99%	43%	100%	96%
Vol Right, %	0%	57%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	7	2	25
LT Vol	1	0	0	1
Through Vol	120	3	2	24
RT Vol	0	4	0	0
Lane Flow Rate	132	8	2	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0.145	0.008	0.003	0.031
Departure Headway (Hd)	3.973	3.867	4.215	4.058
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	906	915	841	882
Service Time	1.983	1.935	2.283	2.085
HCM Lane V/C Ratio	0.146	0.009	0.002	0.031
HCM Control Delay, s/veh	7.7	7	7.3	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0	0	0.1

Lanes, Volumes, Timings
2: N Del Norte Ave & Nielsen Ave

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	2	10	0	0	3	57	6	0	36	0
Future Volume (vph)	0	0	2	10	0	0	3	57	6	0	36	0
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865						0.987					
Flt Protected				0.950			0.998					
Satd. Flow (prot)	0	1611	0	0	1770	0	0	1835	0	0	1863	0
Flt Permitted				0.950			0.998					
Satd. Flow (perm)	0	1611	0	0	1770	0	0	1835	0	0	1863	0
Link Speed (mph)	55			55			55			55		
Link Distance (ft)	2659			2643			2647			315		
Travel Time (s)	33.0			32.8			32.8			3.9		
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
Adj. Flow (vph)	0	0	2	11	0	0	3	62	7	0	39	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	0	0	11	0	0	72	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free			Free			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 19.8% ICU Level of Service A												
Analysis Period (min) 15												

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	2	10	0	0	3	57	6	0	36	0
Future Vol, veh/h	0	0	2	10	0	0	3	57	6	0	36	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	-	-	-	-	-	-	-	-	-	-	-	-
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	0	0	2	11	0	0	3	62	7	0	39	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	2	0	0	43	23	1	58	24	0
Stage 1	-	-	-	-	-	-	1	1	-	22	22	-
Stage 2	-	-	-	-	-	-	42	22	-	36	2	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	-	-	-	1620	-	-	960	870	1084	939	869	-
Stage 1	-	-	-	-	-	-	1022	895	-	996	877	-
Stage 2	-	-	-	-	-	-	972	877	-	980	894	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1620	-	-	-	864	1084	878	863	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	864	-	878	863	-
Stage 1	-	-	-	-	-	-	1022	895	-	996	871	-
Stage 2	-	-	-	-	-	-	922	871	-	907	894	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	7.2		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	1620	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.007	-	-	-
HCM Control Delay (s/veh)	-	0	-	-	7.2	0	-	-
HCM Lane LOS	-	A	-	-	A	A	-	-
HCM 95th %tile Q (veh)	-	-	-	-	0	-	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	1	0	282	549	7
Future Volume (vph)	6	1	0	282	549	7
Ideal Flow (vphpl)	1750	1750	1750	1900	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983				0.998	
Flt Protected	0.958					
Satd. Flow (prot)	1616	0	0	1863	1859	0
Flt Permitted	0.958					
Satd. Flow (perm)	1616	0	0	1863	1859	0
Link Speed (mph)	55			55	55	
Link Distance (ft)	2643			2662	464	
Travel Time (s)	32.8			33.0	5.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1	0	307	597	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	307	605	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.00	1.00	1.11
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.3% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	1	0	282	549	7
Future Vol, veh/h	6	1	0	282	549	7
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	7	1	0	307	597	8

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	908	601	605
Stage 1	601	-	-
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	306	500	973
Stage 1	547	-	-
Stage 2	746	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	306	500	973
Mov Cap-2 Maneuver	306	-	-
Stage 1	547	-	-
Stage 2	746	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	973	-	324	-	-
HCM Lane V/C Ratio	-	-	0.023	-	-
HCM Control Delay (s/veh)	0	-	16.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q (veh)	0	-	0.1	-	-

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Future + Project

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	737	74	91	717	56	55	70	175	94	56	6
Future Volume (vph)	6	737	74	91	717	56	55	70	175	94	56	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	550		330	545		0	110		0	150		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98		1.00			0.99			1.00	
Frt			0.850		0.989			0.893			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3492	0	1630	1642	0	1630	1831	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1430	1630	3492	0	1630	1642	0	1630	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181		9			137			6	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		257			2648			2614			2647	
Travel Time (s)		3.2			32.8			32.4			32.8	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	7	801	80	99	779	61	60	76	190	102	61	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	801	80	99	840	0	60	266	0	102	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

4: N Del Norte Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	28.4		8.9	38.4		8.9	37.0	
Total Split (s)	8.9	33.6	33.6	14.0	38.7		13.7	38.4		14.0	38.7	
Total Split (%)	8.9%	33.6%	33.6%	14.0%	38.7%		13.7%	38.4%		14.0%	38.7%	
Maximum Green (s)	4.0	28.7	28.7	9.1	33.8		8.8	33.5		9.1	33.8	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		16.5			26.5			25.1	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	4.9	48.6	48.6	11.0	59.5		12.6	17.1		9.6	16.1	
Actuated g/C Ratio	0.05	0.49	0.49	0.11	0.60		0.13	0.17		0.10	0.16	
v/c Ratio	0.09	0.47	0.10	0.55	0.40		0.29	0.68		0.65	0.23	
Control Delay (s/veh)	48.0	21.7	0.3	31.1	15.3		42.7	25.4		63.6	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	48.0	21.7	0.3	31.1	15.3		42.7	25.4		63.6	33.6	
LOS	D	C	A	C	B		D	C		E	C	
Approach Delay (s/veh)		20.0			17.0			28.6			51.6	
Approach LOS		B			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 22 (22%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay (s/veh): 22.3

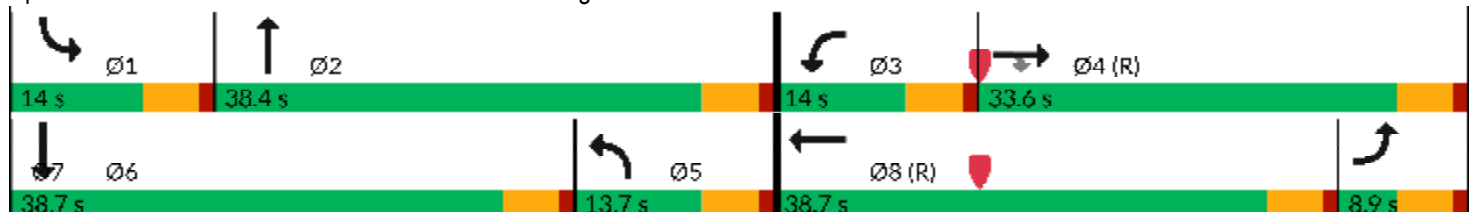
Intersection LOS: C

Intersection Capacity Utilization 62.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: N Del Norte Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

4: N Del Norte Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	737	74	91	717	56	55	70	175	94	56	6
Future Volume (veh/h)	6	737	74	91	717	56	55	70	175	94	56	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	1.00		0.97
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	7	801	80	99	779	61	60	76	190	102	61	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	1631	659	138	1156	90	322	99	247	140	165	19
Arrive On Green	0.20	0.46	0.46	0.03	0.11	0.11	0.20	0.21	0.20	0.09	0.10	0.09
Sat Flow, veh/h	1641	3554	1436	1641	3330	261	1641	466	1165	1641	1641	188
Grp Volume(v), veh/h	7	801	80	99	416	424	60	0	266	102	0	68
Grp Sat Flow(s),veh/h/ln	1641	1777	1436	1641	1777	1814	1641	0	1631	1641	0	1829
Q Serve(g_s), s	0.3	15.7	1.5	6.0	22.4	22.5	3.0	0.0	15.4	6.1	0.0	3.5
Cycle Q Clear(g_c), s	0.3	15.7	1.5	6.0	22.4	22.5	3.0	0.0	15.4	6.1	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.14	1.00		0.71	1.00		0.10
Lane Grp Cap(c), veh/h	322	1631	659	138	617	629	322	0	345	140	0	184
V/C Ratio(X)	0.02	0.49	0.12	0.72	0.67	0.67	0.19	0.00	0.77	0.73	0.00	0.37
Avail Cap(c_a), veh/h	322	1631	659	164	617	629	322	0	561	164	0	635
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.58	0.58	0.58	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	18.9	3.2	47.4	38.8	38.9	33.5	0.0	37.4	44.6	0.0	42.1
Incr Delay (d2), s/veh	0.0	1.1	0.4	6.9	3.4	3.4	0.3	0.0	3.6	12.8	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.9	1.0	2.7	11.0	11.3	1.2	0.0	6.1	2.8	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.5	20.0	3.6	54.4	42.3	42.2	33.8	0.0	41.1	57.5	0.0	43.3
LnGrp LOS	C	B	A	D	D	D	C		D	E		D
Approach Vol, veh/h	888			939			326			170		
Approach Delay, s/veh	18.6			43.5			39.7			51.8		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	25.2	12.4	49.9	23.7	14.0	23.6	38.7				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	9.1	33.5	9.1	28.7	8.8	33.8	4.0	33.8				
Max Q Clear Time (g_c+I1), s	8.1	17.4	8.0	17.7	5.0	5.5	2.3	24.5				
Green Ext Time (p_c), s	0.0	0.9	0.0	3.0	0.0	0.2	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	34.1											
HCM 6th LOS	C											

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Future + Project

05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	801	143	131	800	40	153	157	74	82	237	107
Future Volume (vph)	93	801	143	131	800	40	153	157	74	82	237	107
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	175		0	230		0	190		160	120		100
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00			1.00				0.98			0.98
Frt		0.977			0.993				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3448	0	1630	3509	0	1630	3539	1458	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3448	0	1630	3509	0	1630	3539	1431	1630	3539	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			5				181			181
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2648			2537			2624			2662	
Travel Time (s)		32.8			31.5			32.5			33.0	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	101	871	155	142	870	43	166	171	80	89	258	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	1026	0	142	913	0	166	171	80	89	258	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1	1	1	1	1
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	50	50		50	50		50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												

Lanes, Volumes, Timings
5: S Madera Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.9	34.1		8.9	34.1		8.9	32.7	32.7	8.9	29.9	29.9
Total Split (s)	13.5	36.0		15.0	37.5		17.0	34.6	34.6	14.4	32.0	32.0
Total Split (%)	13.5%	36.0%		15.0%	37.5%		17.0%	34.6%	34.6%	14.4%	32.0%	32.0%
Maximum Green (s)	8.6	31.1		10.1	32.6		12.1	29.7	29.7	9.5	27.1	27.1
Yellow Time (s)	3.9	3.9		3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	-0.9	-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	C-Max	C-Min	C-Min
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		22.2			22.2			20.8	20.8		18.0	18.0
Pedestrian Calls (#/hr)		5			5			5	5		5	5
Act Effct Green (s)	16.8	34.3		14.2	31.7		13.9	17.6	17.6	17.9	21.6	21.6
Actuated g/C Ratio	0.17	0.34		0.14	0.32		0.14	0.18	0.18	0.18	0.22	0.22
v/c Ratio	0.37	0.86		0.61	0.82		0.73	0.27	0.20	0.31	0.34	0.26
Control Delay (s/veh)	34.9	31.8		48.1	29.9		48.6	29.6	6.2	43.1	35.5	2.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	34.9	31.8		48.1	29.9		48.6	29.6	6.2	43.1	35.5	2.2
LOS	C	C		D	C		D	C	A	D	D	A
Approach Delay (s/veh)		32.1			32.3			32.7			28.6	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 20 (20%), Referenced to phase 1:SBL and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay (s/veh): 31.7

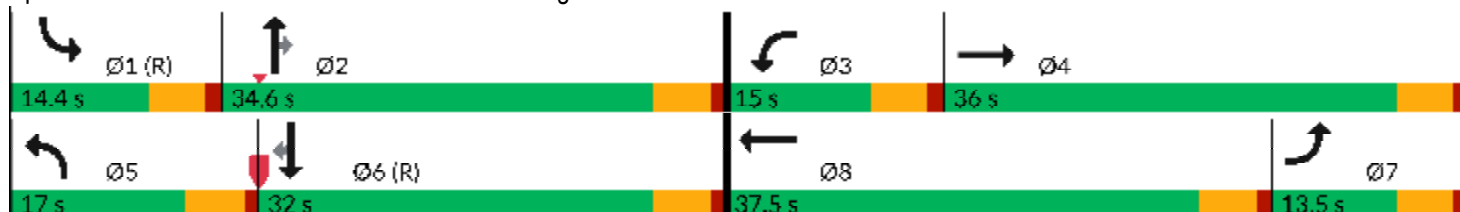
Intersection LOS: C

Intersection Capacity Utilization 78.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 5: S Madera Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

5: S Madera Ave & Whitesbridge Ave

AM Future + Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	93	801	143	131	800	40	153	157	74	82	237	107
Future Volume (veh/h)	93	801	143	131	800	40	153	157	74	82	237	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.98	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	101	871	155	142	870	43	166	171	80	89	258	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	230	956	170	180	991	49	204	626	251	387	1021	412
Arrive On Green	0.05	0.10	0.10	0.15	0.38	0.37	0.21	0.29	0.29	0.24	0.29	0.29
Sat Flow, veh/h	1641	3005	535	1641	3440	170	1641	3554	1427	1641	3554	1433
Grp Volume(v), veh/h	101	515	511	142	449	464	166	171	80	89	258	116
Grp Sat Flow(s),veh/h/ln	1641	1777	1762	1641	1777	1833	1641	1777	1427	1641	1777	1433
Q Serve(g_s), s	6.0	28.7	28.7	8.3	23.5	23.5	9.6	3.7	4.4	4.4	5.6	4.2
Cycle Q Clear(g_c), s	6.0	28.7	28.7	8.3	23.5	23.5	9.6	3.7	4.4	4.4	5.6	4.2
Prop In Lane	1.00		0.30	1.00		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	230	565	561	180	512	528	204	626	251	387	1021	412
V/C Ratio(X)	0.44	0.91	0.91	0.79	0.88	0.88	0.81	0.27	0.32	0.23	0.25	0.28
Avail Cap(c_a), veh/h	230	569	564	180	595	614	213	1087	437	387	1021	412
HCM Platoon Ratio	0.33	0.33	0.33	1.33	1.33	1.33	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(l)	0.87	0.87	0.87	0.92	0.92	0.92	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	43.4	43.4	41.6	29.2	29.3	38.5	30.4	30.6	30.9	27.4	12.2
Incr Delay (d2), s/veh	1.1	17.0	17.2	18.8	11.8	11.5	19.8	0.2	0.7	0.3	0.6	1.7
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	2.5	16.1	16.0	4.0	9.7	10.0	4.5	1.5	1.4	1.7	2.3	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.0	60.4	60.6	60.4	41.0	40.8	58.3	30.6	31.3	31.2	28.0	14.0
LnGrp LOS	D	E	E	E	D	D	E	C	C	C	C	B
Approach Vol, veh/h	1127				1055				417		463	
Approach Delay, s/veh	59.1				43.5				41.8		25.1	
Approach LOS	E				D				D		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.6	21.6	15.0	35.8	16.5	32.7	18.0	32.8				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	9.5	29.7	10.1	31.1	12.1	27.1	8.6	32.6				
Max Q Clear Time (g_c+l1), s	6.4	6.4	10.3	30.7	11.6	7.6	8.0	25.5				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.2	0.0	1.4	0.0	2.2				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	46.2											
HCM 6th LOS	D											

Lanes, Volumes, Timings
6: S Vineland Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	936	146	34	712	3	120	43	88	5	20	8
Future Volume (vph)	7	936	146	34	712	3	120	43	88	5	20	8
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	320		310	410		0	170		0	105		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00			0.99			0.99	
Frt			0.850		0.999			0.899			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3539	1458	1630	3535	0	1630	1654	0	1630	1771	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	3539	1410	1630	3535	0	1630	1654	0	1630	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181					96			9	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2537			7954			2633			2706	
Travel Time (s)		31.5			98.6			32.6			33.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	8	1017	159	37	774	3	130	47	96	5	22	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1017	159	37	777	0	130	143	0	5	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings

6: S Vineland Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	27.0	27.0	8.9	32.7		8.9	32.7		8.9	35.6	
Total Split (s)	8.9	39.4	39.4	9.0	39.5		16.0	42.7		8.9	35.6	
Total Split (%)	8.9%	39.4%	39.4%	9.0%	39.5%		16.0%	42.7%		8.9%	35.6%	
Maximum Green (s)	4.0	34.5	34.5	4.1	34.6		11.1	37.8		4.0	30.7	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9		3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Don't Walk (s)		15.1	15.1		20.8			20.8			23.7	
Pedestrian Calls (#/hr)		5	5		5			5			5	
Act Effct Green (s)	6.4	57.6	57.6	5.0	61.2		12.9	27.3		4.9	12.2	
Actuated g/C Ratio	0.06	0.58	0.58	0.05	0.61		0.13	0.27		0.05	0.12	
v/c Ratio	0.08	0.50	0.18	0.46	0.36		0.62	0.28		0.06	0.14	
Control Delay (s/veh)	58.4	6.0	0.8	64.5	13.0		54.9	10.7		47.2	27.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	58.4	6.0	0.8	64.5	13.0		54.9	10.7		47.2	27.7	
LOS	E	A	A	E	B		D	B		D	C	
Approach Delay (s/veh)		5.6			15.4			31.8			30.4	
Approach LOS		A			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 18 (18%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay (s/veh): 12.5

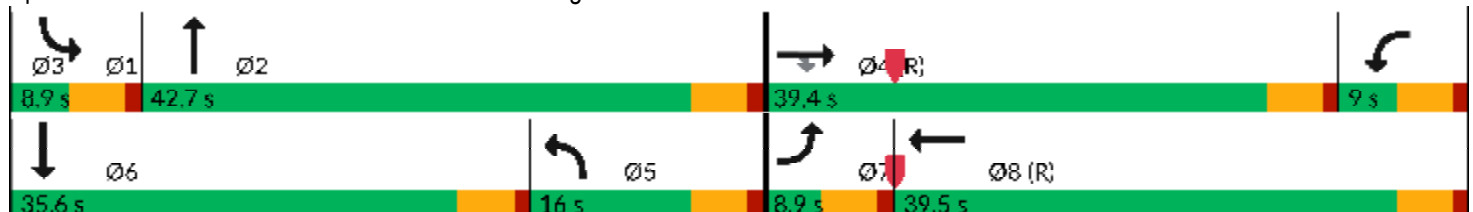
Intersection LOS: B

Intersection Capacity Utilization 52.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: S Vineland Ave & Whitesbridge Ave



HCM 6th Signalized Intersection Summary

6: S Vineland Ave & Whitesbridge Ave

AM Future + Project
05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	936	146	34	712	3	120	43	88	5	20	8
Future Volume (veh/h)	7	936	146	34	712	3	120	43	88	5	20	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	1.00		0.96
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			
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	8	1017	159	37	774	3	130	47	96	5	22	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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	28	1258	502	489	2305	9	171	94	192	23	105	43
Arrive On Green	0.01	0.12	0.12	0.30	0.63	0.63	0.10	0.17	0.17	0.01	0.08	0.08
Sat Flow, veh/h	1641	3554	1418	1641	3630	14	1641	539	1101	1641	1246	510
Grp Volume(v), veh/h	8	1017	159	37	379	398	130	0	143	5	0	31
Grp Sat Flow(s),veh/h/ln	1641	1777	1418	1641	1777	1867	1641	0	1641	1641	0	1755
Q Serve(g_s), s	0.5	27.9	10.3	1.6	9.9	9.9	7.7	0.0	7.9	0.3	0.0	1.7
Cycle Q Clear(g_c), s	0.5	27.9	10.3	1.6	9.9	9.9	7.7	0.0	7.9	0.3	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.67	1.00		0.29
Lane Grp Cap(c), veh/h	28	1258	502	489	1128	1185	171	0	286	23	0	148
V/C Ratio(X)	0.29	0.81	0.32	0.08	0.34	0.34	0.76	0.00	0.50	0.21	0.00	0.21
Avail Cap(c_a), veh/h	80	1258	502	489	1128	1185	197	0	635	80	0	555
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	0.54	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.1	40.9	33.1	25.2	8.5	8.5	43.6	0.0	37.7	48.7	0.0	42.8
Incr Delay (d2), s/veh	3.0	3.1	0.9	0.1	0.8	0.8	14.0	0.0	1.4	4.5	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	0.2	13.6	3.7	0.6	3.2	3.4	3.6	0.0	3.1	0.1	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.1	44.0	34.0	25.3	9.3	9.2	57.6	0.0	39.0	53.3	0.0	43.5
LnGrp LOS	D	D	C	C	A	A	E		D	D		D
Approach Vol, veh/h	1184				814				273			
Approach Delay, s/veh	42.7				10.0				47.9			
Approach LOS	D				A				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	21.4	33.8	39.4	14.4	12.4	5.7	67.5				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	4.0	37.8	4.1	34.5	11.1	30.7	4.0	34.6				
Max Q Clear Time (g_c+I1), s	2.3	9.9	3.6	29.9	9.7	3.7	2.5	11.9				
Green Ext Time (p_c), s	0.0	0.5	0.0	2.3	0.0	0.1	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	31.8											
HCM 6th LOS	C											

Lanes, Volumes, Timings
7: N Del Norte Ave & W Kearney Blvd

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	291	9	13	150	41	5	70	22	92	54	51
Future Volume (vph)	118	291	9	13	150	41	5	70	22	92	54	51
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850			0.850		0.964			0.928	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3412	0	1630	3284	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1458	1630	1863	1458	1630	3412	0	1630	3284	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		4000			2647			5379			2614	
Travel Time (s)		49.6			32.8			66.7			32.4	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	128	316	10	14	163	45	5	76	24	100	59	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	128	316	10	14	163	45	5	100	0	100	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	41.0%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	291	9	13	150	41	5	70	22	92	54	51
Future Vol, veh/h	118	291	9	13	150	41	5	70	22	92	54	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	316	10	14	163	45	5	76	24	100	59	55
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay, s/veh	14.5	11.5	10.4	10.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	51%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	49%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	47	45	118	291	9	13	150	41	92	36
LT Vol	5	0	0	118	0	0	13	0	0	92	0
Through Vol	0	47	23	0	291	0	0	150	0	0	36
RT Vol	0	0	22	0	0	9	0	0	41	0	0
Lane Flow Rate	5	51	49	128	316	10	14	163	45	100	39
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.011	0.099	0.092	0.237	0.54	0.015	0.028	0.3	0.073	0.202	0.074
Departure Headway (Hd)	7.546	7.046	6.706	6.647	6.147	5.447	7.121	6.621	5.921	7.288	6.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	473	507	532	540	585	655	501	541	603	491	526
Service Time	5.317	4.817	4.478	4.397	3.897	3.197	4.882	4.382	3.682	5.049	4.549
HCM Lane V/C Ratio	0.011	0.101	0.092	0.237	0.54	0.015	0.028	0.301	0.075	0.204	0.074
HCM Control Delay, s/veh	10.4	10.6	10.2	11.5	15.9	8.3	10.1	12.2	9.2	11.9	10.1
HCM Lane LOS	B	B	B	B	C	A	B	B	A	B	B
HCM 95th-tile Q	0	0.3	0.3	0.9	3.2	0	0.1	1.3	0.2	0.7	0.2

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	208	68	36	228	108	38	366	14	49	382	34
Future Volume (vph)	34	208	68	36	228	108	38	366	14	49	382	34
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	100		100	90		100	100		0	190		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.98			0.98		1.00			1.00	
Frt			0.850			0.850		0.995			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1863	1458	1630	1863	1458	1630	3517	0	1630	3491	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1863	1430	1630	1863	1432	1630	3517	0	1630	3491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181			181		4			10	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2647			2577			8993			2624	
Travel Time (s)		32.8			31.9			111.5			32.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	37	226	74	39	248	117	41	398	15	53	415	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	226	74	39	248	117	41	413	0	53	452	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												

Lanes, Volumes, Timings
8: S Madera Ave & W Kearney Blvd

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	8.9	29.9	29.9	8.9	34.1	34.1	8.9	27.0		8.9	28.4	
Total Split (s)	13.0	39.0	39.0	13.0	39.0	39.0	13.0	34.0		14.0	35.0	
Total Split (%)	13.0%	39.0%	39.0%	13.0%	39.0%	39.0%	13.0%	34.0%		14.0%	35.0%	
Maximum Green (s)	8.1	34.1	34.1	8.1	34.1	34.1	8.1	29.1		9.1	30.1	
Yellow Time (s)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9		3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9		-0.9	-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Min		None	C-Min	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		18.0	18.0		22.2	22.2		15.1			16.5	
Pedestrian Calls (#/hr)		5	5		5	5		5			5	
Act Effct Green (s)	8.7	20.3	20.3	8.8	20.4	20.4	8.9	51.8		9.5	54.8	
Actuated g/C Ratio	0.09	0.20	0.20	0.09	0.20	0.20	0.09	0.52		0.10	0.55	
v/c Ratio	0.26	0.60	0.17	0.27	0.65	0.27	0.28	0.23		0.34	0.24	
Control Delay (s/veh)	46.6	41.8	0.9	46.6	43.9	2.3	46.8	17.7		43.0	12.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	46.6	41.8	0.9	46.6	43.9	2.3	46.8	17.7		43.0	12.7	
LOS	D	D	A	D	D	A	D	B		D	B	
Approach Delay (s/veh)		33.4			32.1			20.3			15.9	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 90 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay (s/veh): 24.4

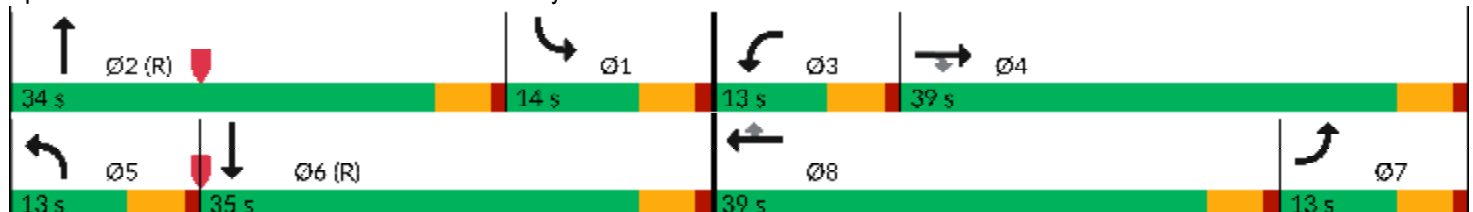
Intersection LOS: C

Intersection Capacity Utilization 53.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: S Madera Ave & W Kearney Blvd



HCM 6th Signalized Intersection Summary

8: S Madera Ave & W Kearney Blvd

AM Future + Project

05/23/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	208	68	36	228	108	38	366	14	49	382	34
Future Volume (veh/h)	34	208	68	36	228	108	38	366	14	49	382	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.96	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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	37	226	74	39	248	117	41	398	15	53	415	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	341	260	62	344	262	65	560	21	754	1914	170
Arrive On Green	0.04	0.18	0.18	0.04	0.18	0.18	0.04	0.16	0.15	0.15	0.19	0.19
Sat Flow, veh/h	1641	1870	1427	1641	1870	1427	1641	3486	131	1641	3297	293
Grp Volume(v), veh/h	37	226	74	39	248	117	41	202	211	53	223	229
Grp Sat Flow(s),veh/h/ln	1641	1870	1427	1641	1870	1427	1641	1777	1840	1641	1777	1812
Q Serve(g_s), s	2.2	11.2	4.5	2.3	12.5	7.3	2.5	10.8	10.9	2.8	10.6	10.7
Cycle Q Clear(g_c), s	2.2	11.2	4.5	2.3	12.5	7.3	2.5	10.8	10.9	2.8	10.6	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.16
Lane Grp Cap(c), veh/h	59	341	260	62	344	262	65	285	296	754	1032	1052
V/C Ratio(X)	0.62	0.66	0.28	0.63	0.72	0.45	0.63	0.71	0.71	0.07	0.22	0.22
Avail Cap(c_a), veh/h	148	655	499	148	655	500	148	533	552	754	1032	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	47.5	38.0	35.3	47.4	38.4	36.3	47.3	39.8	39.8	24.1	21.2	21.3
Incr Delay (d2), s/veh	10.2	2.2	0.6	10.0	2.9	1.2	9.8	13.9	13.7	0.0	0.4	0.4
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	1.0	5.0	1.5	1.1	5.6	2.5	1.1	5.5	5.7	1.0	4.5	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.7	40.3	35.9	57.4	41.3	37.5	57.1	53.7	53.5	24.1	21.7	21.7
LnGrp LOS	E	D	D	E	D	D	E	D	D	C	C	C
Approach Vol, veh/h	337			404			454			505		
Approach Delay, s/veh	41.2			41.7			53.9			21.9		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	49.9	20.1	7.8	22.2	7.9	62.1	7.6	22.4				
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9				
Max Green Setting (Gmax), s	9.1	29.1	8.1	34.1	8.1	30.1	8.1	34.1				
Max Q Clear Time (g_c+I1), s	4.8	12.9	4.3	13.2	4.5	12.7	4.2	14.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	1.0	0.0	1.4	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay, s/veh	39.0											
HCM 6th LOS	D											

Lanes, Volumes, Timings
9: S Vineland Ave & W Kearney Blvd

AM Future + Project
05/23/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	154	65	36	148	78	50	175	28	54	258	25
Future Volume (vph)	45	154	65	36	148	78	50	175	28	54	258	25
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.967			0.960			0.985			0.987	
Flt Protected		0.992			0.993			0.990		0.950		
Satd. Flow (prot)	0	1787	0	0	1776	0	0	1816	0	1630	1839	0
Flt Permitted		0.992			0.993			0.990		0.950		
Satd. Flow (perm)	0	1787	0	0	1776	0	0	1816	0	1630	1839	0
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2577			8058			2629			2633	
Travel Time (s)		31.9			99.9			32.6			32.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
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
Adj. Flow (vph)	49	167	71	39	161	85	54	190	30	59	280	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	287	0	0	285	0	0	274	0	59	307	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.9%						ICU Level of Service B					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	17.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	154	65	36	148	78	50	175	28	54	258	25
Future Vol, veh/h	45	154	65	36	148	78	50	175	28	54	258	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	167	71	39	161	85	54	190	30	59	280	27
Number of Lanes	0	1	0	0	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	17.1	16.9	17.2	18.4
HCM LOS	C	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	17%	14%	100%	0%
Vol Thru, %	69%	58%	56%	0%	91%
Vol Right, %	11%	25%	30%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	253	264	262	54	283
LT Vol	50	45	36	54	0
Through Vol	175	154	148	0	258
RT Vol	28	65	78	0	25
Lane Flow Rate	275	287	285	59	308
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.521	0.531	0.525	0.123	0.597
Departure Headway (Hd)	6.825	6.662	6.635	7.566	6.991
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	525	539	541	472	514
Service Time	4.91	4.743	4.715	5.345	4.769
HCM Lane V/C Ratio	0.524	0.532	0.527	0.125	0.599
HCM Control Delay, s/veh	17.2	17.1	16.9	11.4	19.7
HCM Lane LOS	C	C	C	B	C
HCM 95th-tile Q	3	3.1	3	0.4	3.9



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION Whitesbridge Ave @ N Del Norte Ave

LATITUDE 36.7348

COUNTY Fresno

LONGITUDE -120.0692

COLLECTION DATE Thursday, February 29, 2024

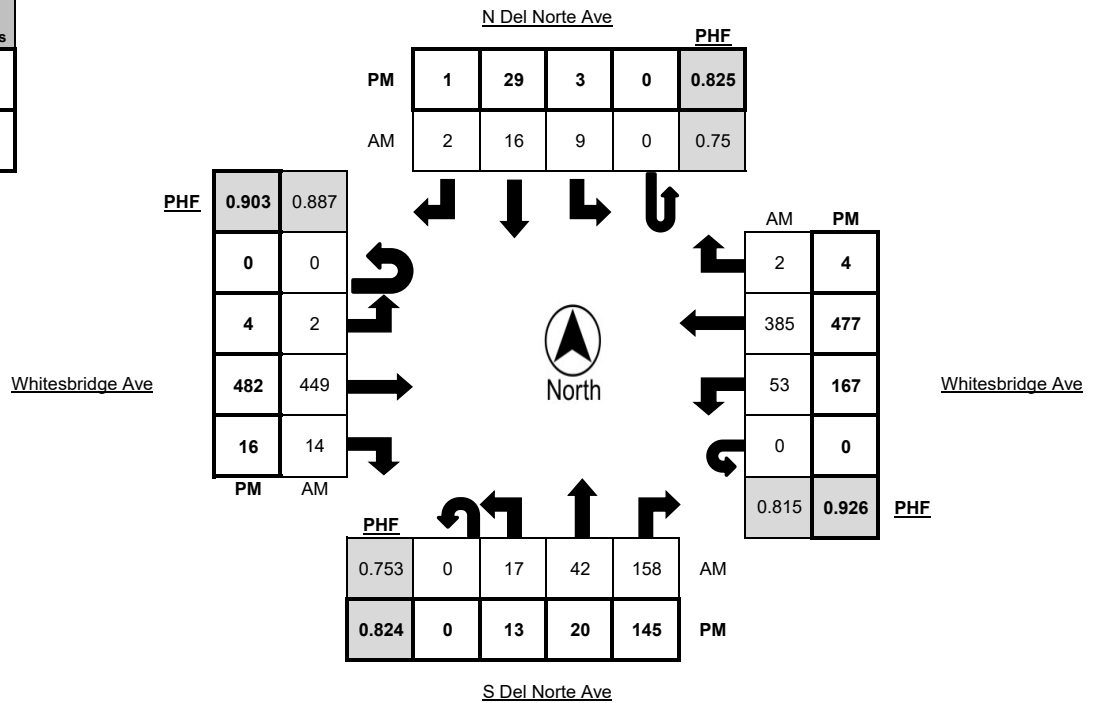
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	3	4	21	0	0	0	0	0	0	0	0	46	0	2	0	4	63	1	2
6:15 AM - 6:30 AM	0	6	2	26	1	0	1	1	0	0	0	0	80	0	9	0	3	76	0	5
6:30 AM - 6:45 AM	0	4	9	27	0	0	1	1	0	0	0	0	62	1	4	0	2	64	1	3
6:45 AM - 7:00 AM	0	0	16	26	0	0	2	1	0	0	0	0	81	1	3	0	5	72	1	2
7:00 AM - 7:15 AM	0	1	6	30	2	0	0	1	1	0	0	0	95	0	2	0	8	92	0	6
7:15 AM - 7:30 AM	0	5	13	41	0	0	3	5	0	0	0	1	119	2	3	0	15	100	1	6
7:30 AM - 7:45 AM	0	3	14	32	0	0	2	5	1	1	0	1	112	4	7	0	13	122	0	9
7:45 AM - 8:00 AM	0	8	9	55	4	0	4	5	0	0	0	0	123	8	4	0	17	71	1	4
TOTAL	0	30	73	258	7	0	13	19	2	1	0	2	718	16	34	0	67	660	5	37

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	5	5	25	1	0	0	8	1	1	0	0	135	2	5	0	37	111	3	4
4:15 PM - 4:30 PM	0	4	6	38	2	0	2	16	1	1	0	0	118	5	7	0	28	118	0	0
4:30 PM - 4:45 PM	0	3	5	35	0	0	4	8	0	0	0	0	92	1	8	0	27	121	3	2
4:45 PM - 5:00 PM	0	3	3	36	0	0	3	9	0	0	0	0	93	4	2	0	33	120	1	4
5:00 PM - 5:15 PM	0	5	7	39	1	0	1	9	0	0	0	0	129	5	7	0	44	118	1	2
5:15 PM - 5:30 PM	0	5	3	30	0	0	1	9	0	0	0	1	135	3	4	0	36	114	1	2
5:30 PM - 5:45 PM	0	1	6	47	0	0	1	7	1	0	0	1	117	2	2	0	40	133	2	1
5:45 PM - 6:00 PM	0	2	4	29	0	0	0	4	0	0	0	2	101	6	4	0	47	112	0	1
TOTAL	0	28	39	279	4	0	12	70	3	2	0	4	920	28	39	0	292	947	11	16

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	17	42	158	6	0	9	16	2	1	0	2	449	14	16	0	53	385	2	25
5:00 PM - 6:00 PM	0	13	20	145	1	0	3	29	1	0	0	4	482	16	17	0	167	477	4	6

	PHF	Trucks
AM	0.930	4.2%
PM	0.950	1.8%





Metro Traffic Data Inc.
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Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION Whitesbridge Ave @ S Madera Ave

LATITUDE 36.7349

COUNTY Fresno

LONGITUDE -120.0601

COLLECTION DATE Thursday, February 29, 2024

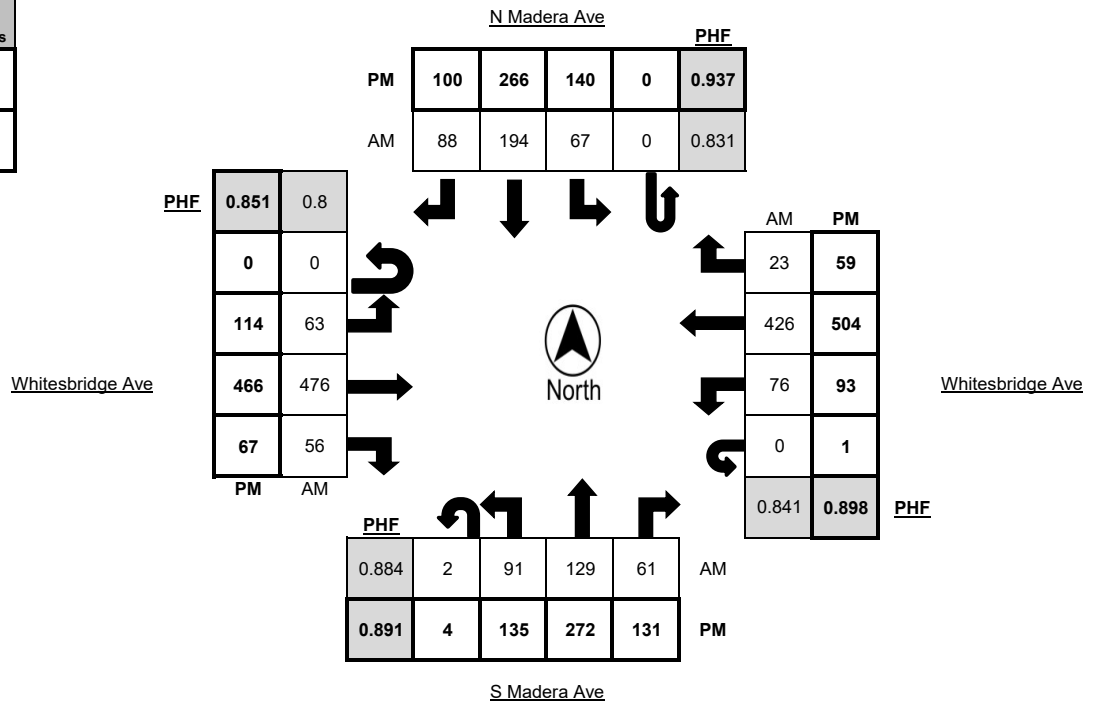
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	14	29	12	4	0	3	52	12	3	0	10	52	3	6	0	6	34	7	2
6:15 AM - 6:30 AM	0	13	35	13	6	0	7	41	8	6	0	14	87	11	9	0	10	51	7	5
6:30 AM - 6:45 AM	1	8	47	14	6	0	10	42	14	2	0	21	73	3	3	0	10	62	9	4
6:45 AM - 7:00 AM	0	15	25	12	6	0	17	55	8	9	0	14	82	8	3	0	12	62	15	7
7:00 AM - 7:15 AM	0	15	31	11	5	0	11	39	8	2	0	6	103	10	3	0	15	84	3	4
7:15 AM - 7:30 AM	0	18	37	17	6	0	16	47	22	10	0	22	110	5	6	0	14	102	4	9
7:30 AM - 7:45 AM	1	33	28	12	8	0	18	53	30	8	0	16	116	21	7	0	18	129	9	5
7:45 AM - 8:00 AM	1	25	33	21	5	0	22	55	28	6	0	19	147	20	6	0	29	111	7	11
TOTAL	3	141	265	112	46	0	104	384	130	46	0	122	770	81	43	0	114	635	61	47

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	41	92	23	6	0	24	70	15	5	0	23	142	25	8	0	32	117	17	4
4:15 PM - 4:30 PM	1	33	82	30	4	0	34	73	16	5	0	35	92	18	7	0	26	103	10	0
4:30 PM - 4:45 PM	2	26	77	35	4	0	31	77	15	9	0	18	109	22	7	0	29	117	14	3
4:45 PM - 5:00 PM	1	32	81	22	1	0	45	71	19	5	0	20	101	13	5	0	20	121	12	2
5:00 PM - 5:15 PM	0	41	68	43	1	0	30	65	28	0	0	35	135	20	7	0	26	128	22	2
5:15 PM - 5:30 PM	0	34	68	30	1	0	31	71	26	3	0	24	106	17	5	0	25	109	11	1
5:30 PM - 5:45 PM	3	28	55	36	5	0	34	59	27	1	0	35	124	17	4	1	22	146	14	0
5:45 PM - 6:00 PM	0	31	51	31	1	0	35	45	30	1	0	30	103	18	4	1	33	80	13	4
TOTAL	7	266	574	250	23	0	264	531	176	29	0	220	912	150	47	2	213	921	113	16

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	2	91	129	61	24	0	67	194	88	26	0	63	476	56	22	0	76	426	23	29
4:45 PM - 5:45 PM	4	135	272	131	8	0	140	266	100	9	0	114	466	67	21	1	93	504	59	5

	PHF	Trucks
AM	0.846	5.8%
PM	0.917	1.8%





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Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION Whitesbridge Ave @ S Vineland Ave

LATITUDE 36.7349

COUNTY Fresno

LONGITUDE -120.0514

COLLECTION DATE Thursday, February 29, 2024

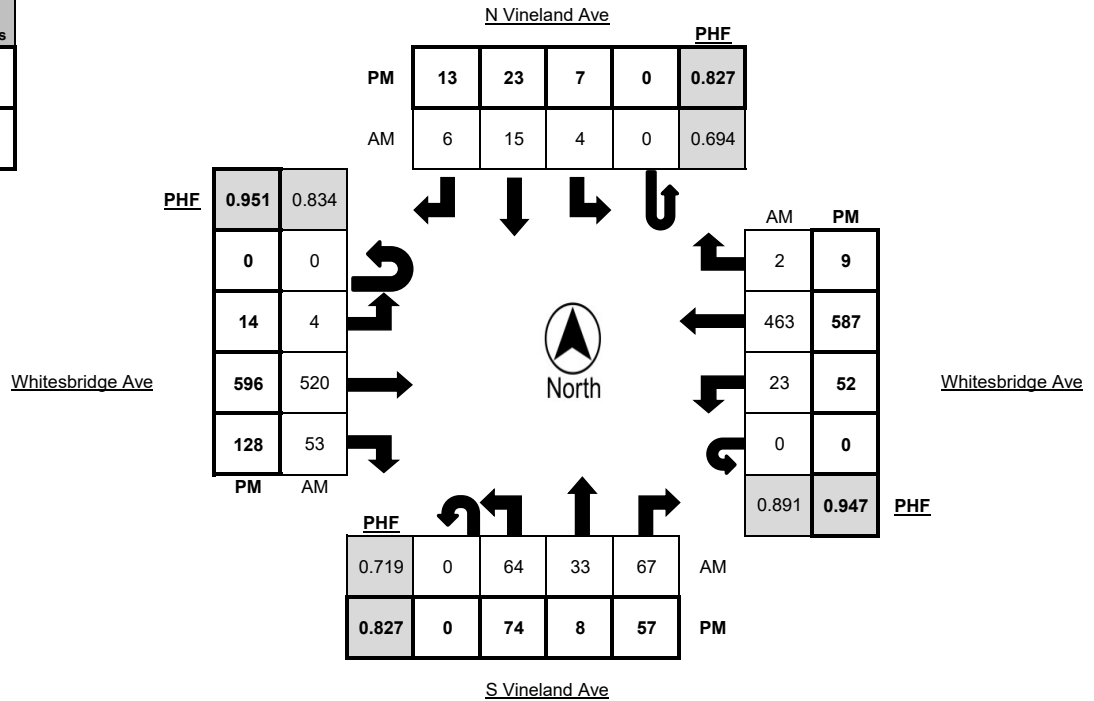
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	5	6	5	0	0	0	2	0	0	0	0	64	2	7	0	4	41	0	1
6:15 AM - 6:30 AM	0	12	9	11	1	0	2	2	0	1	0	0	97	1	6	0	2	59	0	4
6:30 AM - 6:45 AM	0	7	6	7	0	0	0	0	0	0	0	0	109	4	5	0	1	85	0	5
6:45 AM - 7:00 AM	0	12	6	11	0	0	0	1	0	0	0	0	109	9	6	0	6	81	1	5
7:00 AM - 7:15 AM	0	10	4	15	0	0	2	1	2	1	0	1	116	4	3	0	5	97	1	7
7:15 AM - 7:30 AM	0	13	9	12	2	0	1	4	3	2	0	2	115	8	6	0	5	107	0	5
7:30 AM - 7:45 AM	0	14	14	16	0	0	0	3	0	0	0	0	145	13	6	0	7	129	1	4
7:45 AM - 8:00 AM	0	27	6	24	0	0	1	7	1	0	0	1	144	28	5	0	6	130	0	7
TOTAL	0	100	60	101	3	0	6	20	6	4	0	4	899	69	44	0	36	729	3	38

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	15	4	9	1	0	3	6	1	0	0	1	153	20	8	0	9	140	1	2
4:15 PM - 4:30 PM	0	9	2	15	0	0	5	4	2	0	0	2	147	36	8	0	16	136	2	1
4:30 PM - 4:45 PM	0	28	2	12	0	0	0	6	7	0	0	1	144	28	6	0	14	136	3	4
4:45 PM - 5:00 PM	0	17	2	16	1	0	0	5	2	0	0	5	160	29	9	0	8	161	2	2
5:00 PM - 5:15 PM	0	20	2	14	0	0	2	8	2	0	0	6	145	35	6	0	14	154	2	2
5:15 PM - 5:30 PM	0	16	1	15	0	0	0	6	4	0	0	3	154	40	4	0	14	117	0	1
5:30 PM - 5:45 PM	0	13	3	13	0	0	0	4	3	0	0	2	127	36	2	0	13	172	1	2
5:45 PM - 6:00 PM	0	23	3	10	0	0	0	5	3	0	0	3	132	28	1	0	12	165	1	3
TOTAL	0	141	19	104	2	0	10	44	24	0	0	23	1162	252	44	0	100	1181	12	17

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	64	33	67	2	0	4	15	6	3	0	4	520	53	20	0	23	463	2	23
4:15 PM - 5:15 PM	0	74	8	57	1	0	7	23	13	0	0	14	596	128	29	0	52	587	9	9

	PHF	Trucks
AM	0.836	3.8%
PM	0.963	2.5%





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Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION W Kearney Blvd @ N Del Norte Ave

LATITUDE 36.7275

COUNTY Fresno

LONGITUDE -120.0693

COLLECTION DATE Thursday, February 29, 2024

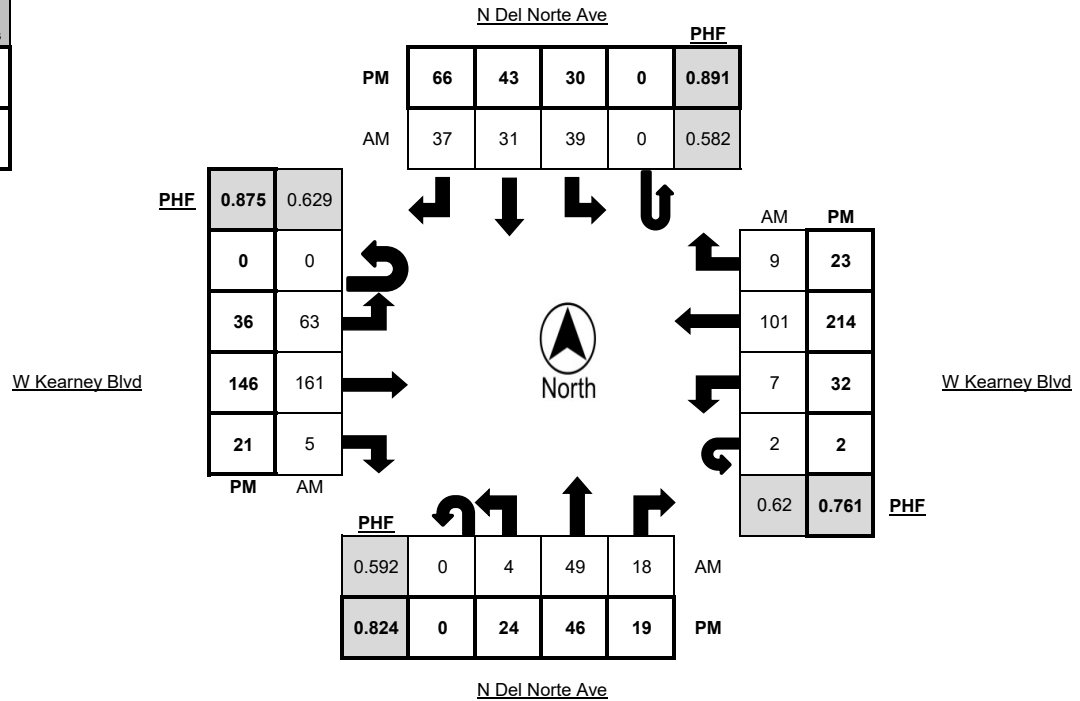
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	1	8	2	0	0	1	4	1	0	0	2	14	0	0	0	0	5	1	1
6:15 AM - 6:30 AM	0	0	6	2	0	0	5	3	1	0	0	3	14	0	0	1	1	2	4	2
6:30 AM - 6:45 AM	0	1	8	2	0	0	2	3	4	0	0	15	15	2	0	0	0	10	0	0
6:45 AM - 7:00 AM	0	4	5	2	0	0	2	7	1	0	0	9	30	1	0	0	1	19	3	0
7:00 AM - 7:15 AM	0	0	5	1	0	0	6	6	4	0	0	11	30	0	0	0	0	12	1	1
7:15 AM - 7:30 AM	0	1	8	4	0	0	6	5	9	0	0	12	28	0	0	1	4	25	1	0
7:30 AM - 7:45 AM	0	3	13	6	0	0	10	8	7	3	0	14	43	0	0	0	1	25	1	0
7:45 AM - 8:00 AM	0	0	23	7	1	0	17	12	17	1	0	26	60	5	0	1	2	39	6	0
TOTAL	0	10	76	26	1	0	49	48	44	4	0	92	234	8	0	3	9	137	17	4

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	2	11	5	0	0	3	11	8	0	0	6	30	2	0	0	5	42	5	0
4:15 PM - 4:30 PM	0	4	13	0	0	0	5	5	15	0	0	11	34	4	3	0	3	50	6	0
4:30 PM - 4:45 PM	0	0	11	1	0	0	4	7	16	0	0	8	36	2	0	1	3	52	1	3
4:45 PM - 5:00 PM	0	4	10	4	0	0	8	9	15	0	0	12	43	3	0	0	8	48	4	0
5:00 PM - 5:15 PM	0	6	11	5	0	0	8	14	17	0	0	7	40	5	0	1	12	67	9	2
5:15 PM - 5:30 PM	0	2	14	6	0	0	8	10	15	0	0	8	37	6	0	0	6	55	5	0
5:30 PM - 5:45 PM	0	12	11	4	0	0	6	10	19	0	0	9	26	7	0	1	6	44	5	0
5:45 PM - 6:00 PM	0	4	9	7	0	0	6	12	11	0	0	7	30	3	0	1	5	53	6	0
TOTAL	0	34	90	32	0	0	48	78	116	0	0	68	276	32	3	4	48	411	41	5

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	4	49	18	1	0	39	31	37	4	0	63	161	5	0	2	7	101	9	1
4:45 PM - 5:45 PM	0	24	46	19	0	0	30	43	66	0	0	36	146	21	0	2	32	214	23	2

	PHF	Trucks
AM	0.612	1.1%
PM	0.869	0.3%





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Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION W Kearney Blvd @ S Madera Ave

LATITUDE 36.7276

COUNTY Fresno

LONGITUDE -120.0603

COLLECTION DATE Thursday, February 29, 2024

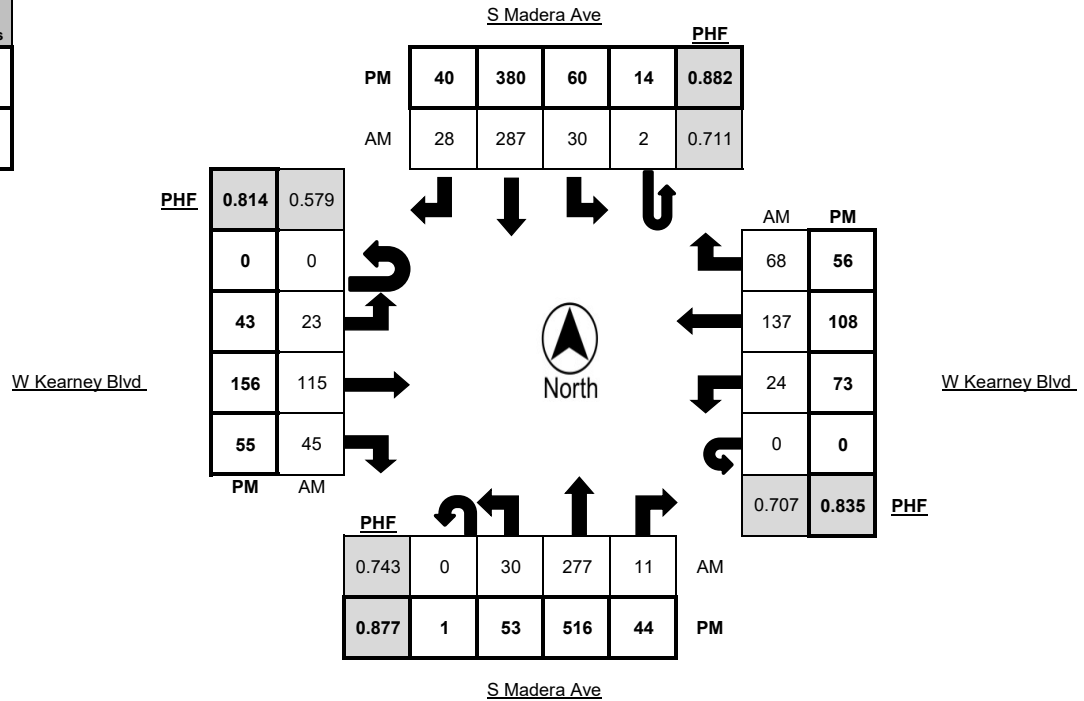
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	3	52	2	4	0	0	63	1	4	0	6	4	5	2	0	4	9	10	0
6:15 AM - 6:30 AM	0	2	38	2	5	1	1	59	2	8	0	4	7	11	2	0	3	5	10	0
6:30 AM - 6:45 AM	0	1	56	1	6	2	3	69	0	1	0	9	12	13	0	0	9	10	11	0
6:45 AM - 7:00 AM	0	2	31	1	4	1	3	71	5	7	0	13	11	4	0	0	6	16	16	1
7:00 AM - 7:15 AM	0	4	47	4	4	0	3	57	3	2	0	6	9	6	0	0	5	22	14	0
7:15 AM - 7:30 AM	0	11	69	1	6	0	5	57	4	7	0	5	20	6	0	0	4	33	14	1
7:30 AM - 7:45 AM	0	8	66	1	6	1	14	74	7	4	0	5	28	19	0	0	5	38	13	3
7:45 AM - 8:00 AM	0	7	95	5	4	1	8	99	14	6	0	7	58	14	0	0	10	44	27	0
TOTAL	0	38	454	17	39	6	37	549	36	39	0	55	149	78	4	0	46	177	115	5

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	2	144	7	5	2	22	106	11	7	0	2	35	16	1	0	13	30	12	0
4:15 PM - 4:30 PM	1	18	130	4	5	6	13	107	9	6	0	4	29	10	0	0	17	15	10	1
4:30 PM - 4:45 PM	0	10	121	15	6	3	17	110	10	9	0	12	37	14	4	0	23	24	13	0
4:45 PM - 5:00 PM	0	8	123	9	1	1	13	69	9	4	0	16	38	16	0	0	14	37	13	0
5:00 PM - 5:15 PM	0	17	142	16	1	4	17	94	12	0	0	11	52	15	2	0	19	32	20	0
5:15 PM - 5:30 PM	0	10	99	7	1	3	14	75	16	4	0	14	38	17	0	0	16	41	13	0
5:30 PM - 5:45 PM	1	6	94	8	3	0	9	83	11	0	0	3	41	20	0	0	13	24	15	0
5:45 PM - 6:00 PM	0	12	69	7	0	0	12	89	11	4	0	16	42	24	0	0	24	22	9	0
TOTAL	2	83	922	73	22	19	117	733	89	34	0	78	312	132	7	0	139	225	105	1

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	30	277	11	20	2	30	287	28	19	0	23	115	45	0	0	24	137	68	4
4:15 PM - 5:15 PM	1	53	516	44	13	14	60	380	40	19	0	43	156	55	6	0	73	108	56	1

	PHF	Trucks
AM	0.692	4.0%
PM	0.886	2.4%





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LOCATION W Kearney Blvd @ S Vineland Ave

LATITUDE 36.7277

COUNTY Fresno

LONGITUDE -120.0514

COLLECTION DATE Thursday, February 29, 2024

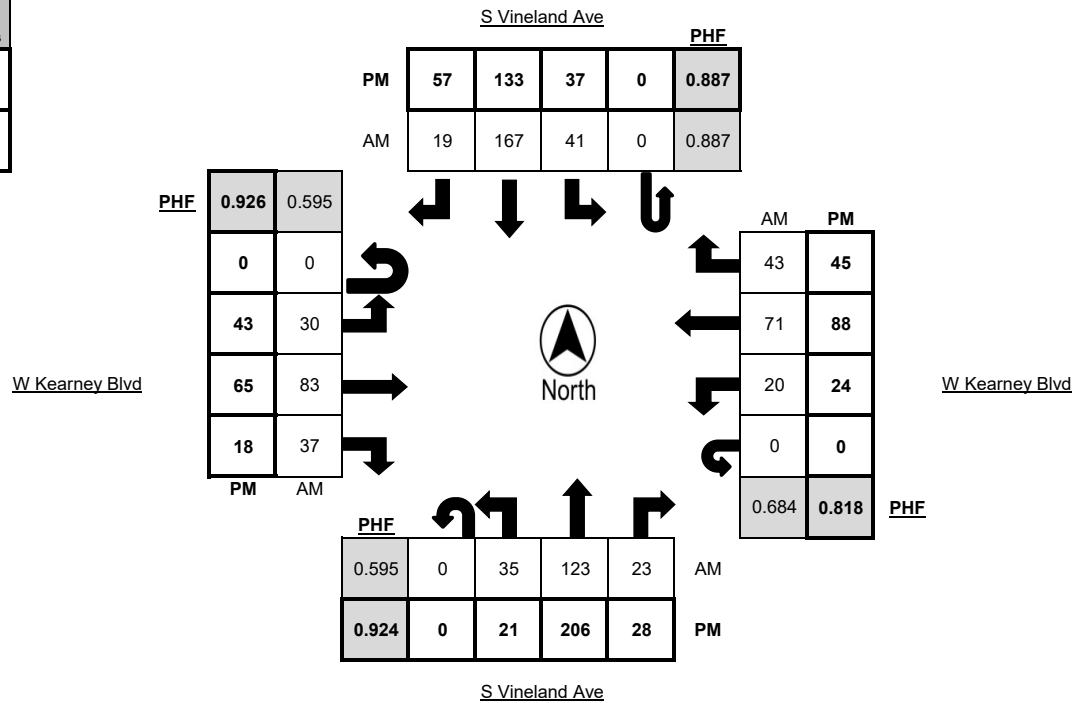
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	0	7	1	0	0	1	10	3	0	0	2	6	4	0	0	3	2	2	0
6:15 AM - 6:30 AM	0	1	2	2	0	0	2	12	0	0	0	7	12	2	0	0	3	4	2	0
6:30 AM - 6:45 AM	0	3	14	4	0	0	4	18	4	0	0	9	2	4	1	0	3	6	6	0
6:45 AM - 7:00 AM	0	7	16	3	0	0	4	15	0	0	0	4	18	8	0	0	2	13	7	2
7:00 AM - 7:15 AM	0	8	12	3	2	0	3	38	1	2	0	5	12	4	1	0	4	11	8	1
7:15 AM - 7:30 AM	0	7	19	1	1	0	4	50	3	0	0	5	16	9	2	0	4	14	6	1
7:30 AM - 7:45 AM	0	9	38	8	2	0	12	48	4	0	0	7	20	9	0	0	5	17	16	0
7:45 AM - 8:00 AM	0	11	54	11	0	0	22	31	11	1	0	13	35	15	1	0	7	29	13	0
TOTAL	0	46	162	33	5	0	52	222	26	3	0	52	121	55	5	0	31	96	60	4

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	1	30	4	0	0	6	45	6	0	0	12	23	6	1	0	7	15	7	0
4:15 PM - 4:30 PM	0	4	30	2	0	0	5	29	3	0	0	6	16	4	0	0	6	14	7	1
4:30 PM - 4:45 PM	0	7	36	9	1	0	10	30	10	0	0	11	16	5	2	0	6	20	9	1
4:45 PM - 5:00 PM	0	6	58	5	2	0	6	31	11	0	0	11	18	5	0	0	7	14	11	0
5:00 PM - 5:15 PM	0	5	51	5	1	0	9	35	19	0	0	10	18	4	0	0	5	21	13	0
5:15 PM - 5:30 PM	0	6	50	9	1	0	13	37	14	0	0	11	17	5	0	0	6	23	9	0
5:30 PM - 5:45 PM	0	4	47	9	0	0	9	30	13	0	0	11	12	4	0	0	6	30	12	0
5:45 PM - 6:00 PM	0	4	58	5	0	0	6	27	7	0	0	9	13	2	0	0	4	12	16	0
TOTAL	0	37	360	48	5	0	64	264	83	0	0	81	133	35	3	0	47	149	84	2

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	35	123	23	5	0	41	167	19	3	0	30	83	37	4	0	20	71	43	2
4:45 PM - 5:45 PM	0	21	206	28	4	0	37	133	57	0	0	43	65	18	0	0	24	88	45	0

	PHF	Trucks
AM	0.687	2.0%
PM	0.956	0.5%





Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
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Bakersfield, CA 93301

LOCATION W Nielsen Ave @ Del Norte Ave

LATITUDE 36.7421

COUNTY Fresno

LONGITUDE -120.0691

COLLECTION DATE Thursday, February 29, 2024

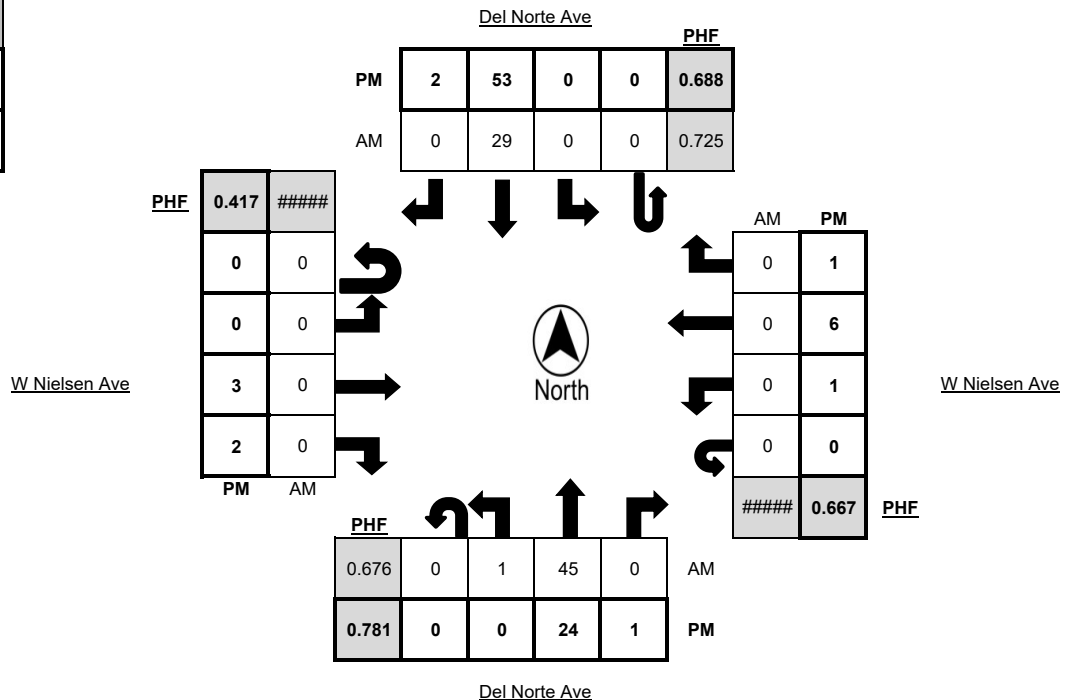
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6:15 AM - 6:30 AM	0	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
6:30 AM - 6:45 AM	0	0	8	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0
6:45 AM - 7:00 AM	0	0	18	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
7:00 AM - 7:15 AM	0	0	6	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	12	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	17	0	0	0	0	0	8	0	1	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	1	10	0	1	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1	78	0	2	0	0	35	0	1	0	0	1	0	0	0	0	0	1	0

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	2	6	0	0	0	1	9	0	1	0	0	1	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	6	0	0	0	0	20	0	1	0	0	0	0	0	0	1	2	0	1
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5:15 PM - 5:30 PM	0	0	5	0	0	0	0	9	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	9	0	0	0	0	8	1	0	0	0	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	4	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	48	1	0	0	1	86	4	3	0	1	5	2	0	0	1	6	1	1

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	1	45	0	2	0	0	29	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	24	1	0	0	0	53	2	2	0	0	3	2	0	0	1	6	1	1

	PHF	Trucks
AM	0.750	4.0%
PM	0.802	3.2%



Turning Movement Report

Prepared For:

Ruetters & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

LOCATION W Nielsen Ave @ Madera Ave

LATITUDE 36.7423

COUNTY Fresno

LONGITUDE -120.0601

COLLECTION DATE Thursday, February 29, 2024

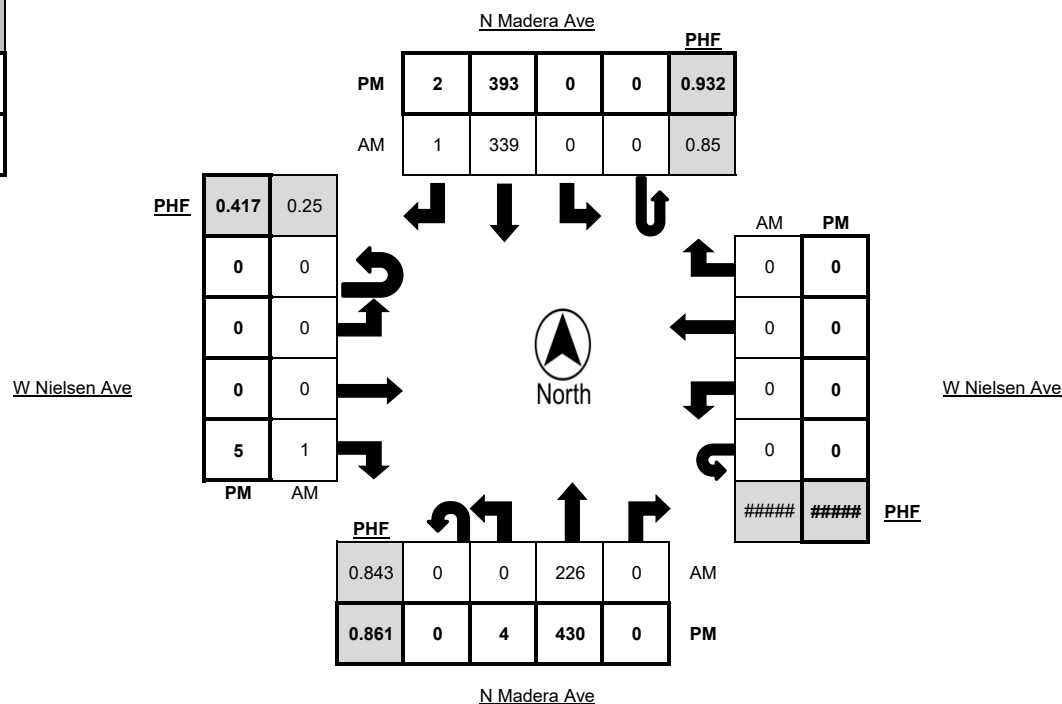
WEATHER Clear

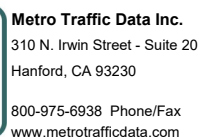
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6:15 AM - 6:30 AM	0	0	54	0	4	0	0	54	0	4	0	0	0	0	0	0	0	0	0	0
6:30 AM - 6:45 AM	0	1	73	0	6	0	0	67	0	1	0	0	0	0	0	0	0	0	0	0
6:45 AM - 7:00 AM	0	0	49	0	2	0	0	82	0	7	0	0	0	0	0	0	0	0	0	0
7:00 AM - 7:15 AM	0	0	41	0	4	0	0	56	0	2	0	0	0	1	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	64	0	3	0	0	96	1	14	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	54	0	9	0	0	87	0	3	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	67	0	6	0	0	100	0	5	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	450	0	35	0	0	612	1	38	0	0	0	2	0	0	0	0	0	0

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	126	0	6	0	0	106	0	5	0	0	0	2	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	2	116	0	4	0	0	86	1	5	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	1	106	0	3	0	0	100	0	11	0	0	0	3	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	1	82	0	2	0	0	101	1	3	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	2	117	0	0	0	0	107	0	2	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	84	0	0	0	0	77	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	1	85	0	4	0	0	91	0	2	0	1	0	2	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	82	0	1	0	0	85	0	1	0	0	0	0	0	0	0	0	0	0
TOTAL	0	7	798	0	20	0	0	753	2	30	0	1	0	7	0	0	0	0	0	0

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	0	226	0	22	0	0	339	1	24	0	0	0	1	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	4	430	0	15	0	0	393	2	24	0	0	0	5	0	0	0	0	0	0

	PHF	Trucks
AM	0.849	8.1%
PM	0.891	4.7%





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LATITUDE

COUNTY Fresno

LONGITUDE

COLLECTION DATE Tuesday, March 12, 2024

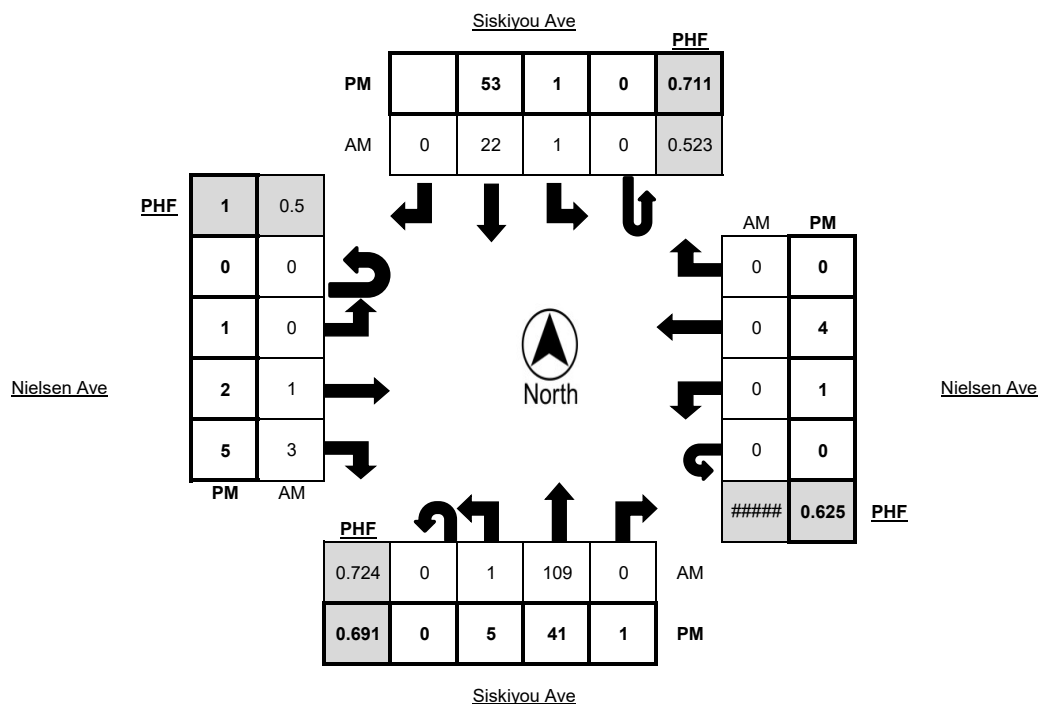
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
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6:00 AM - 6:15 AM	0	0	4	0	0	0	0	1	0	0	0	0	2	1	0	0	0	0	0	0
6:15 AM - 6:30 AM	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6:30 AM - 6:45 AM	0	0	5	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM - 7:00 AM	0	1	13	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0
7:00 AM - 7:15 AM	0	0	11	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	27	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	38	0	0	0	1	10	0	1	0	0	0	1	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	1	33	0	0	0	0	9	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL	0	2	136	0	1	0	2	29	1	1	0	0	4	4	1	0	0	0	0	0

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	2	11	0	2	0	0	15	0	0	0	0	1	1	0	0	0	1	0	0
4:15 PM - 4:30 PM	0	2	15	0	0	0	1	10	0	0	0	0	1	0	1	0	0	1	0	0
4:30 PM - 4:45 PM	0	0	10	0	0	0	0	11	1	0	0	0	0	2	0	0	0	2	0	0
4:45 PM - 5:00 PM	0	1	5	1	0	0	0	17	2	0	0	0	1	1	0	0	1	0	0	0
5:00 PM - 5:15 PM	0	0	4	0	0	0	0	13	0	0	0	0	0	0	0	0	0	1	0	0
5:15 PM - 5:30 PM	0	0	8	0	0	0	1	13	0	0	0	1	1	0	0	0	1	0	0	0
5:30 PM - 5:45 PM	0	1	9	0	0	0	0	13	0	0	0	0	0	1	0	0	1	2	0	0
5:45 PM - 6:00 PM	0	1	7	0	0	0	0	11	0	0	0	1	0	0	0	0	1	0	0	0
TOTAL	0	7	69	1	2	0	2	103	3	0	0	3	3	6	0	0	4	7	0	0

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	1	109	0	1	0	1	22	0	1	0	0	1	3	1	0	0	0	0	0
4:00 PM - 5:00 PM	0	5	41	1	2	0	1	53	3	0	0	1	2	5	0	0	1	4	0	0

	PHF	Trucks
AM	0.685	2.2%
PM	0.944	1.7%



2020 Quality/ Level of Service Handbook



June 2020

State of Florida Department of Transportation

Systems Implementation Office
605 Suwannee St. MS 19
Tallahassee, FL 32399

www.fdot.gov/planning

Table of Contents

1	Executive Summary	1
2	Q/LOS Handbook Purpose and Scope	2
	2.1. Levels of Analysis.....	2
	2.1.1. Generalized Planning	3
	2.2 Travel Modes.....	3
	2.2.1 Automobile	3
	2.2.2 Pedestrian	4
	2.2.3 Bicycle	4
	2.2.4 Transit	4
	2.3 What's New in This Version of the Q/LOS Handbook?	5
3	Q/LOS Principles	6
	3.1 Common Q/LOS Misconceptions	6
	3.2. Highway Capacity Manual	8
	3.2.1 Traffic Flow and Capacity Concepts	8
	3.2.2. Bicycle LOS (BLOS).....	9
	3.2.3. Pedestrian LOS (PLOS).....	9
	3.3. Transit Capacity and QOS.....	9
	3.4. Simplifying Assumptions.....	10
	3.4.1. Averages.....	10
	3.4.2. Turning Movements.....	10
	3.4.3. Queue Spillback.....	11
	3.4.4. Capacity.....	11
	3.4.5. Bus Frequency.....	11
	3.5. Arterial Analyses.....	11
	3.5.1 Pedestrian and Bus Analyses	12
4	Roadway Variables	14
	4.1. Roadway Type	14
	4.1.1. Freeways	14
	4.1.2. Highways	14
	4.1.3. Arterials.....	14
	4.2. Area Type.....	15
	4.2.1. Core Urbanized and Urbanized Areas	16
	4.2.2. Transitioning Areas	16
	4.2.3. Urban Areas	17
	4.2.4. Rural Areas.....	17
	4.3. Number of Through Lanes	17
	4.3.1. Arterials.....	18
	4.3.2. Highways	19
	4.4. Speed	20
	4.4.1. Posted Speed	20
	4.4.2. Free-Flow Speed	20

4.5. Median Type.....	20
4.5.1. Arterials.....	20
4.6. Exclusive Turn Lanes.....	21
4.6.1. Arterials.....	21
4.7. Roadway Lengths.....	21
4.7.1. Arterials.....	22
5 Traffic Variables.....	23
5.1. Volume and Demand.....	23
5.2. Annual Average Daily Traffic (AADT).....	24
5.3. Planning Analysis Hour Factor (K).....	24
5.3.1 Multimodal Transportation Districts (MMTD).....	26
5.4. Directional Distribution Factor (D).....	26
5.5. Peak Hour Factor (PHF).....	26
5.6. Base Saturation Flow Rate.....	27
5.7. Heavy Vehicle Percent.....	27
5.8. Speed and Capacity Adjustment Factors.....	27
5.9. Percent Turns from Exclusive Turn Lanes.....	28
6 Control Variables.....	30
6.1. Number of Signals.....	31
6.2. Arrival Type.....	32
6.3. Signal Type.....	33
6.3.1. Actuated.....	33
6.3.2. Actuated-Coordinated.....	33
6.3.3. Pretimed.....	33
6.4. Cycle Length (C).....	34
6.5. Effective Green Ratio (g/C).....	34
7 Multimodal Variables.....	36
7.1. Paved Shoulder/Bicycle Lane.....	37
7.2. Outside Lane Width.....	37
7.3. Pavement Condition.....	38
7.4. Sidewalk.....	38
7.5. Sidewalk Protective Barrier.....	39
7.6. Bus Frequency.....	39
7.7. Bus Stop Amenities.....	40
7.8. Bus Stop Type.....	40
7.9. Passenger Loads.....	40

8	Future Year Analyses	41
	8.1. <i>Change in Traffic Variables</i>	41
	8.1.1. AADT	41
	8.1.2. Planning Analysis Hour Factor (K)	41
	8.1.3. Directional Distribution Factor (D)	41
	8.2. <i>Change in Control Variables</i>	42
	8.2.1 g/C.....	42
	8.2.2 Signal Density	42
9	Maximum Capacity Volumes.....	44
	9.1. <i>Arterials</i>	44
	9.2. <i>Freeways</i>	44
	9.3. <i>Highways</i>	45
10	Florida’s LOS Policy	46
11	Generalized Planning Analysis.....	47
	11.1. <i>Introduction</i>	47
	11.2. <i>Special Cases</i>	49
	11.2.1. Mid-Block Considerations	49
	11.2.2. Non-State Signalized Roadways Adjustment	50
	11.2.3. Variations in Levels of Service.....	50
	11.2.4. Median and Turn Lane Adjustment (Divided/Undivided Roadways).....	50
	11.2.5. One-Way Facility Adjustments.....	51
	11.2.6. Auxiliary Lane Adjustment	51
	11.2.7. Ramp Metering Adjustment	51
	11.2.8. Bicycle LOS (BLOS).....	51
	11.2.9. Pedestrian LOS (PLOS).....	52
	11.2.10. Bus LOS	52
	11.3. <i>Service Volume Calculation Process</i>	53
	11.3.1. Arterial LOS	53
	11.3.2. Freeway Facilities LOS.....	54
	11.3.3. Highways LOS	54
	Glossary.....	55
	2020 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES.....	67

List of Figures

Figure 2-1: Traffic Analysis Tools	3
Figure 3-1: Examples of LOS by Mode for Arterials	7
Figure 4-1: Area Types	15
Figure 4-2: Usable Length	19
Figure 4-3: Example of Six-Lane Roadway	19
Figure 5-1: Predominant Turning Movement	29
Figure 5-2: Through Movement at a T Intersection with Exclusive Lanes	29
Figure 5-3: Through Movement at a T Intersection with Shared Lanes	29
Figure 6-1: Total Number of Signals	32
Figure 7-1: Outside Lane Width	38
Figure 7-2: Sidewalk/Roadway Separation	39

List of Tables

Table 3-1: Service Frequency LOS Thresholds	10
Table 3-2: PLOS Adjustment Factors on Bus LOS	12
Table 5-1: Calculation of Percent Turns from Exclusive Turn Lanes	28
Table 6-1: Control Variable Input Requirements	30
Table 6-2: Sensitivity of Control Variables on Service Volumes	31
Table 7-1: Multimodal Variable Input Requirements	36
Table 7-2: Sensitivity of Multimodal Variables on Service Volumes	37
Table 7-3: Bus Stop Amenity Factors	40
Table 7-4: Passenger Load Factor	40

1 Executive Summary

This Quality Level of Service (Q/LOS) Handbook is intended to be used by engineers, planners, and decision-makers in the development and review of roadway capacity and roadway users' Q/LOS at generalized planning levels. This Q/LOS Handbook provides tools to quantify multimodal transportation service inside the roadway environment (essentially inside the right of way).

This edition of the Q/LOS Handbook is updated and reorganized, still providing a foundation for high-quality, consistent capacity, and level of service (LOS) analyses and review in the State of Florida. It includes new analytical techniques from the Transportation Research Board's Highway Capacity Manual (HCM), Sixth Edition, and updated Generalized Service Volume Tables. With these professionally accepted techniques, analysts can easily evaluate roadways from a multimodal perspective, which results in better multimodal decisions for projects in generalized planning phases.

The focus of generalized planning is the extensive use of default values and is intended for broad applications such as regional analyses, initial problem identification, and future year analyses. Florida's Generalized Service Volume Tables at the end of this Q/LOS Handbook are the primary tools for conducting this type of planning analysis. At this time, only Freeways and Uninterrupted Flow Highways Generalized Service Volume Tables have been updated to be consistent with the HCM methodology. The State Signalized Arterials Generalized Service Volume Tables remained the same as the 2013 Q/LOS Handbook. There are future plans to update the State Signalized Arterials Generalized Service Volume Tables to be consistent with the HCM methodology.

Florida Department of Transportation (FDOT) welcomes questions and comments on the content and concepts of this Q/LOS Handbook. FDOT will provide technical assistance and training as needed for usage of the Q/LOS process. For additional resources, see the FDOT's Systems Implementation Office (SIO) website at <https://www.fdot.gov/planning/systems/>. **Initial contacts should be made with FDOT District and Florida's Turnpike Enterprise personnel.**

2 Q/LOS Handbook Purpose and Scope

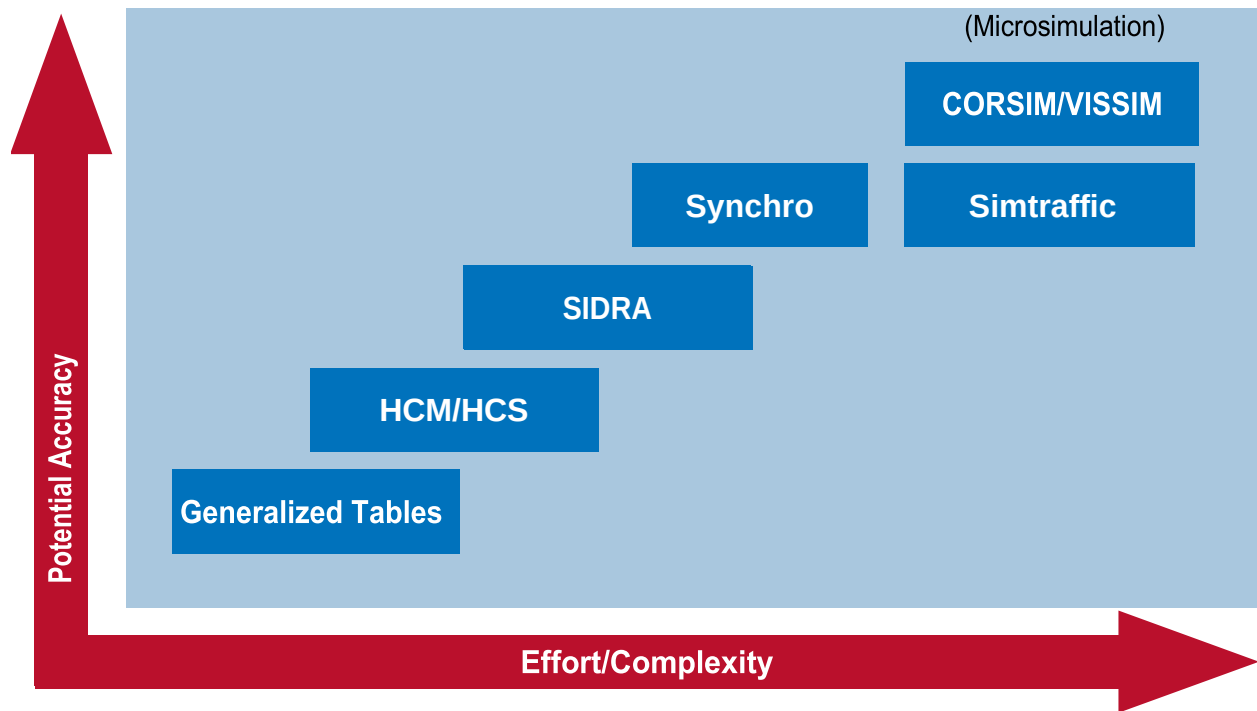
This Q/LOS Handbook is a tool that can be utilized to analyze and review a roadway's capacity at a generalized planning level.

The quality of service (QOS) is a traveler-based perception of how well a transportation service or facility operates. The LOS is a quantitative stratification of the QOS into six letter grades. The LOS provides a measure that assesses multimodal service inside the roadway environment (essentially inside the right of way). **Capacity conceptually relates to the maximum number of vehicles that can pass a point on a roadway in a given amount of time under normal conditions.** The Q/LOS Handbook provides Generalized Service Volume Tables and background regarding statewide default values used in their development. The Generalized Service Volume Tables, found at the end of the Q/LOS Handbook, present maximum service volumes, or the highest numbers of vehicles for a given LOS.

Directions found within the Q/LOS Handbook provide assistance in selecting the most appropriate tools for Q/LOS analysis. This handbook offers specific instructions on how to use the Generalized Service Volume Tables.

2.1. Levels of Analysis

There are many methods for computing capacity and the LOS, which form a hierarchy ranging from Generalized Service Volume Tables (the simplest to use but potentially least accurate) to complex operational analysis tools (very precise, but time-intensive and costly). **Figure 2-1** provides a list of some traffic analysis tools measured by accuracy and complexity. In selecting the appropriate tools, tradeoffs among study purposes (e.g., generalized planning application, signal timing application), accuracy and precision of results (e.g., variability in data for current year analyses, variability in future year analyses), and data preparation effort (e.g., use of existing statewide traffic data, use of direct field measurements) should be considered. Please refer to the [FDOT Traffic Analysis Handbook](#) for additional tools and guidance in selecting the appropriate analysis tool.

Figure 2-1: Traffic Analysis Tools

2.1.1. Generalized Planning

Generalized planning covered in this handbook makes extensive use of default values and is intended for broad applications, such as initial problem identification (e.g., deficiency and needs analyses, geographic influence areas), statewide analyses (e.g., statewide calculation of delay), and future year analyses (e.g., 10-year planning horizon).

Florida's Generalized Service Volume Tables provided at the end of this handbook are the primary tools for conducting Generalized planning analysis. The updated tables have been developed using guidance provided in the HCM.

2.2 Travel Modes

The HCM defines four major travel modes: automobile, pedestrian, bicycle, and transit. Each mode includes a unique set of characteristics that define a traveler's experience during a trip, and it is important to consider each perspective when analyzing a multimodal facility.

2.2.1 Automobile

The three major elements that affect the operation of a vehicle are: roadway characteristics, traffic characteristics, and control characteristics.

Vehicles include passenger cars, trucks, vans, buses, recreational vehicles, and motorcycles. Each vehicle type has a unique set of operational characteristics, and the percentage makeup of each vehicle type within a traffic stream affects the capacity of a facility because of these differences. For example, trucks, buses, and recreational

vehicles have lower acceleration and deceleration rates than standard passenger cars. Factors, such as pavement type and condition, time of day, and weather, affect the operational characteristics of vehicles as well as driver behavior. Other factors, such as fatigue, health, and driving under the influence of drugs and alcohol, also affect driver behavior. **This handbook assumes base conditions that include typical drivers on dry pavement during daylight hours.**

2.2.2 Pedestrian

Many trips include at least one part where the traveler is a pedestrian. This is particularly important for transit trips, where the pedestrian section of the trip may have an impact on future mode choice.

Analyzing the pedestrian experience can be summarized by two primary types of analysis: individual delay and facility attributes. Delay at intersections can be easily quantified and analyzed. The factors that describe a facility and, therefore, contribute to the overall walking experience are less easily quantified, including safety, security, lighting, grades, surface conditions, and even street activity levels. Automobile and heavy vehicle traffic volume, and the extent to which pedestrians are separated from vehicular traffic, also influence pedestrians' perception of QOS while using a sidewalk. **This handbook accounts for the user's perception and facility attributes when determining Pedestrian LOS (PLOS).**

2.2.3 Bicycle

Bicycles are used to make a variety of trips, including trips for recreation, commuting, and errands. Bicycles can help extend the market area of transit service as bicycle travel is typically five times faster than travel on foot.

Similar to the pedestrian experience, Bicycle LOS (BLOS) can be summarized by delays encountered at intersections as well as the attributes of the facility itself. As with the pedestrian analysis, the Q/LOS Handbook focuses on facility attributes when determining BLOS. These attributes include the volume and speed of adjacent vehicles, heavy vehicle presence, the presence of on-street parking and pavement conditions. Because of the severe deterioration of perceived QOS at flow levels well below the theoretical capacity of a bike path, the concept of capacity has little utility in the design and analysis of bicycle paths.

2.2.4 Transit

Transit riders can be grouped into two primary categories: choice and captive riders. Choice transit riders typically have other means of transportation readily available, but choose transit to avoid congestion, save money on fuel and parking, use their travel time productively for other activities, and/or reduce their impact on the environment. Captive riders, however, are unable to drive because of age, physical, mental, or financial reasons, and depend on transit or other modes for their daily transportation needs.

Unlike other modes, transit is primarily focused on service levels rather than facility characteristics. Infrastructure for driving, biking, or walking is available at all times, once constructed; transit service is only available during certain times along designated routes. Additionally, transit passengers are not in direct control of their travel time, service frequency and reliability, therefore, these are important factors that affect the quality and utility of transit service.

When bus service frequencies reach a high enough level of demand (headway of approximately 10 minutes or less),

bus passengers do not feel the need to consult bus schedules. This allows transit users the freedom to treat the system as they would treat other modes. Service frequencies that require passengers to plan their trips around a limited transit schedule offer much less utility, and deter choice riders.

Because transit passengers typically must walk to and from transit stops on either end of their trip, the quality of the walking experience at the beginning or end of a trip may be just as important to the transit passenger as the actual transit experience.

2.3 What's New in This Version of the Q/LOS Handbook?

This edition of the Q/LOS Handbook primarily reflects an update to the 2013 edition and incorporates updates included in the sixth edition of the HCM. The Q/LOS Handbook has been revised to focus on generalized planning for freeways and highways. No changes have been made in this version of the handbook to the arterial methodology and arterial Generalized Service Volume Tables from the 2013 Q/LOS Handbook.

The Generalized Service Volume Tables are the primary tools supported by FDOT for generalized planning. The freeway and highway automobile mode portions of the tables have been updated using the Highway Capacity Software 7 (HCS7), which incorporates the latest procedures provided in the HCM, Sixth Edition. The updated tables also include revised inputs and parameters that coincide with the current methodology in the HCM and default values. The updated tables can be found at the end of this handbook. A summary of the methodology changes is provided below:

- The Generalized Service Volume Tables
 - The 2020 freeway and highway Generalized Service Volume Tables were developed using HCS7, which is based on the HCM, Sixth Edition.
 - There are **no changes** for arterial service volumes between the 2012 and 2020 Generalized Service Volume Tables.
- The freeway service volumes are now based on freeway facilities procedures, incorporating basic segments and interchanges rather than just basic segments.
- The inputs are generally consistent between the 2012 and 2020 versions of the tables, but there have been some updates to maintain internal consistency in the 2020 set of tables.
- New inputs such as Speed Adjustment Factor (SAF) and Capacity Adjustment Factor (CAF) have been introduced into the development of the tables because the input requirements for HCS7 are more extensive than those for Level of Service Planning (LOSPLAN).
- FDOT **no longer** supports the LOSPLAN program and it has not been included in this version of the handbook.

3 Q/LOS Principles

Providing safety and mobility for people and goods remains transportation's most essential function and part of FDOT's mission. There are four dimensions of mobility:

- Quality of travel: traveler satisfaction with a facility or service.
- Quantity of travel: magnitude of use of a facility or service.
- Accessibility: ease in which travelers can engage in desired activities.
- Capacity utilization: quantity of operations relative to capacity.

This Q/LOS Handbook focuses primarily on quality, followed by capacity utilization. The quantity of travel and accessibility dimensions are not addressed in this Q/LOS Handbook.

The QOS is based on a user's perception of how well a transportation service or facility operates. In other words, it's how travelers perceive the overall QOS.

The LOS is a quantitative stratification of the QOS. The HCM divides highways QOS into six letter grades, A through F, with A being the best and F being the worst. With this scheme, traffic engineers more easily explained operating and proposed design concepts to the general public and elected officials.

Despite its widespread use as an independent measurement, it is important to note that the LOS is simply a quantitative breakdown from transportation users' perspectives of transportation QOS. The LOS reflects the QOS, as measured by a scale of user satisfaction, and is applicable to each of the following modes that use roadways: automobiles, trucks, bicycles, pedestrians, and buses.

Because this handbook deals with the overall quality of user satisfaction and its quantitative breakdown, it is labeled as the Q/LOS Handbook. The measurement techniques, however, are simply referred to as LOS analysis. This Q/LOS Handbook deals with the QOS and the LOS that roadways provide to users (i.e., motorists, bicyclists, pedestrians, and transit passengers) and provides planning tools to assist transportation planners and engineers. The overall quality of the entire trip experience, which depends on a variety of factors, including aesthetics, safety, and other social measures are not covered in this handbook.

3.1 Common Q/LOS Misconceptions

Common misconceptions about Q/LOS that often arise:

- The QOS is directly related to all other dimensions of mobility.

This misconception is related to the relationship between quality and other dimensions of mobility. *The QOS is frequently related to the other dimensions of mobility, but not in all cases.* Q/LOS for automobile drivers is usually closely linked to how many other vehicles are on the road. However, the relationship is not always perfect.

For example, arterial speeds are more closely tied to signalization conditions than the number of other vehicles on the roadway. A higher Q/LOS grade may exist on a four-lane arterial with twice the volume of another arterial due to efficient signal progression. For transit users, pedestrians, and bicyclists, there is often an even weaker relationship between total demand and Q/LOS. **In most situations in Florida, the total number of bicyclists and pedestrians on a facility has very little, if any, impact on Q/LOS. Similarly, in most of Florida, bus**

frequency is typically much more important to transit users than how many people are actually on a bus.

In some cases, particularly for the non-automobile modes, an analysis of total potential demand is a more important component of the decision-making process than the QOS. This handbook only addresses Q/LOS, not the methods of determining overall demand or mode splits. Other tools, such as logit models, are more appropriate for these types of analyses.

- The LOS is applicable only to automobile analysis, while the QOS is related to the non-automobile modes.

This misconception is that LOS applies only to automobiles, and QOS applies to the non-automobile modes. It is often assumed that while automobile analyses are highly quantitative, the bicycle, pedestrian, and transit analyses are more qualitative. *However, the bicycle, pedestrian, and transit techniques are as quantitative and rigorously developed and tested as those for automobiles.* An example of LOS by mode for arterials is illustrated in **Figure 3-1**.

Figure 3-1: Examples of LOS by Mode for Arterials



- The LOS A–F grades are comparable to American school letter grades.

The most common misconception about LOS A–F grades is that they are comparable to school letter grades. Although they share some basic similarities, there are some important distinctions to make at a planning level. *Unlike school grades, LOS A is not necessarily a desirable goal, and the meaning of A–F is not entirely consistent across modes. Although it is true that LOS A is best and LOS F is worst, this is strictly from a traveler experience and perspective. LOS A is not necessarily a desirable goal to achieve from an overall transportation or societal perspective.* LOS A in a peak travel hour could be an indicator of an inefficient use of limited funding. It is simply not cost-effective to design the state's roadways to operate at LOS A during the peak hour. FDOT's LOS targets in **Chapter 10** should be considered a desirable condition during the peak hour, with significant variance from those targets in either direction an undesirable condition. The LOS targets are an FDOT Policy ([000-525-006](https://www.fdot.state.fl.us/Policy/000-525-006)) and discussed in **Chapter 10**.

Although LOS F represents a failing condition, there are more factors to consider when the LOS reaches F. Essentially, LOS F either means travel demand exceeds capacity and the roadway is operating in oversaturated conditions, or another undesirable condition exists.

Although each of the methodologies for automobiles, bicycles, pedestrians, and buses make use of the LOS A–F

scales, **the meaning of A–F is not entirely consistent across the modes.**

Transportation professionals widely consider LOS D for the automobile mode an acceptable condition, and this threshold is often used as a design condition in urbanized areas. The bus and automobile LOS scales were developed by transportation professionals, with the objective of classifying various levels of congestion in undersaturated conditions. Members of the general public, however, determined the derivation of the bicycle and PLOS thresholds, thus incorporating a general perception of LOS D as a largely undesirable condition. Because of this, LOS D likely represents a worse condition from the user perspective for the bicycle and pedestrian modes than the automobile and bus modes. FDOT and its research team evaluated and considered various methods to make the LOS thresholds more consistent across modes, but found no scientific basis to adjust the scales. Users should therefore simply be cautious about comparing the same LOS letter grade across modes.

3.2. Highway Capacity Manual

For capacity and automobile, pedestrian, and bicycle Q/LOS analysis, the HCM is the foremost recognized and accepted analysis tool. HCM defines capacity as the maximum sustainable flow rate, which persons or vehicles can reasonably be expected to traverse a point or a uniform segment of a lane or a roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.

3.2.1 Traffic Flow and Capacity Concepts

The HCM defines two primary facility types: uninterrupted and interrupted flow facilities. The terms refer to the type of facility and, therefore, the analysis type, not the quality of traffic flow at any given time.

Uninterrupted flow facilities have no fixed causes of delay or interruption external to the traffic stream, such as signals or stop signs. Non-tolled freeways represent the purest form of uninterrupted flow, because there are no fixed interruptions to traffic flow, and access to the facilities are limited to ramp locations. Multilane and two-lane highways operate under uninterrupted flow in long segments between points of fixed interruption (e.g., traffic signals), but it is often necessary to examine the points of fixed interruption using interrupted flow methodologies.

Interrupted flow facilities have fixed causes of periodic delay or interruption to the traffic stream, such as traffic signals or stop signs, with average spacing less than or equal to 2 miles. Traffic flow patterns on interrupted flow facilities are the result not only of vehicle interactions and the facility's geometric characteristics, but also of the traffic control used at intersections and the frequency of access points to the facility. Traffic signals, for example, allow designated movements to occur only during portions of the signal cycle, and therefore affect flow and capacity, because the facility is not available for continuous use. Traffic signals also create platoons of vehicles that travel along the facility as a group. By contrast, intersections controlled by all-way stops and roundabouts discharge vehicles more randomly, creating periodic but sometimes small gaps in traffic at downstream locations.

Capacity on uninterrupted and interrupted flow facilities can be defined in terms of, passenger cars per hour (pcph), or vehicles per hour (vph), depending on the type of analysis or system element.

Reasonable expectancy is the basis for defining capacity. Capacity is, therefore, not the absolute maximum flow rate observed at a facility, but rather a flow rate that can be achieved repeatedly for peak periods of sufficient

demand.

Prevailing roadway, traffic, and control conditions define capacity. These conditions should be relatively uniform for any segment of a facility that is analyzed. Base conditions, by comparison, assume optimum conditions, including good weather, dry pavement conditions, users who are familiar with the system, and no impediments to traffic flow. In most cases, prevailing conditions differ from base conditions (e.g., there are trucks in the traffic stream, rolling terrain). As a result, the computations of capacity, service flow rate, and LOS include an adjustment to capacity under base conditions.

3.2.2. Bicycle LOS (BLOS)

BLOS is based on bicyclists' perceptions of the roadway environment. BLOS is based on five variables, with relative importance ordered in the following list:

- Average effective width of the outside through lane
- Vehicle volumes
- Vehicle speeds
- Heavy vehicle (truck) volumes
- Pavement condition

Average effective width is largely determined by the width of the outside travel lane and striping for bicyclists but includes other factors, such as the effects of street parking and drainage grates. Each of the variables is weighted by coefficients derived by stepwise regression modeling importance. A numerical LOS score, generally ranging from 0.5 to 6.5, is determined and stratified to an LOS letter grade. Thus, unlike the determination of automobile LOS, in which there is typically only one service measure (e.g., average travel speed), BLOS is determined by multiple factors.

3.2.3. Pedestrian LOS (PLOS)

Like BLOS, **PLOS is based on the pedestrians' perceptions of the roadway or nearby roadside environment.** PLOS is based on four variables with relative importance ordered in the following list:

- Existence of a sidewalk
- Lateral separation of pedestrians from vehicles
- Vehicle volumes
- Vehicle speeds

The PLOS model applies to the roadway facilities within the right of way. Therefore, estimating PLOS for facilities outside the right of way at significantly greater distance, may exceed the validated range of the model and is not recommended.

3.3. Transit Capacity and QOS

The Transportation Research Board (TRB) [Transit Capacity and Quality of Service Manual \(TCQSM\)](#) is the nation's leading document for transit and Q/LOS analysis. As used in this Q/LOS Handbook, transit or bus is limited to scheduled, fixed-route bus transit.

One significant exhibit in the TCQSM is a table for urban scheduled transit service based on service frequency. **Table 3-1** replicates this TCQSM table, but includes Florida-specific modifications to the adjusted service frequency.

Table 3-1: Service Frequency LOS Thresholds

Level of Service	Adjusted Service Frequency (Vehicles/hour)	Headway (minutes)	Comments
A	>6	<10	Passengers don't need schedules
B	>4	<15	Frequent service, passengers consult schedules
C	≥3	≤20	Maximum desirable time to wait if transit vehicle missed
D	≥2	≤30	Service unattractive to choice riders
E	≥1	≤60	Service available during hour
F	<1	>60	Service unattractive to all riders

3.4. Simplifying Assumptions

Planning-level analyses make extensive use of default values and simplifying assumptions to the operational models on which they are based. As such, there are multiple simplifying assumptions used in this Q/LOS Handbook.

3.4.1. Averages

This Q/LOS Handbook makes extensive use of averages. **For generalized planning (Generalized Service Volume Tables), most of the default input variables represent statewide averages. Similarly, for generalized planning, simple averages are recommended.** For example, if an arterial facility has daily volumes of 20,000, 25,000, and 24,000, it would be reasonable to use the average (23,000) of the three. However, users should be cautious of outlying values and use some judgment when applying simple averages. In the above example, if the first value were 10,000, the user may want to disregard that value or use the median value (i.e., 24,000).

3.4.2. Turning Movements

One of the most significant planning assumptions is that the mainline turning movements are adequately accommodated. Within this Q/LOS Handbook, the through movement is defined as the traffic stream with the greatest number of vehicles passing directly through a point. While this movement is typically the Straight Ahead movement, occasionally the right or left turn could qualify as the through movement. When the turning movement has the greatest number of vehicles (more than the Straight Ahead), it is recommended to consider the turning movement as the controlling movement. See [Section 5.9](#) for additional details.

Most analyses of through movements in the HCM are relatively straightforward. Complications arise with the treatment of turning or merging movements, especially for signalized intersections and arterials. By handling turning arterial movements (i.e., turns from the arterial, side-street movements) in a general way, Q/LOS and capacity analyses are greatly simplified. This is also true for some two-lane uninterrupted flow highways in which

mid-block turning movements may affect capacity. Off- and on-ramp movements along freeways are also handled in a general way and are assumed to be adequately accommodated. Most importantly, it is assumed that movements at off-ramps do not back up into the through lanes of the freeway.

When turning movements are not adequately accommodated in the available storage, the techniques to determine the LOS for an arterial found in this handbook are not appropriate. Although, the arterial analysis in this handbook includes all vehicles on the arterial, the focus is on the vehicles making through movements rather than turning movements. For example, only the green time for the through movement is included, and penalties are assigned if there are no left-turn lanes at signalized intersections and no medians exist mid-block.

3.4.3. Queue Spillback

Another major assumption is that turning movements do not back up into adjacent through lanes. Essentially, adequate storage is assumed to be available for turning vehicles on arterials and for vehicles exiting freeways. Therefore, where mainline turning movements are not adequately accommodated, the planning techniques found in the Q/LOS Handbook are not appropriate. If this is the case, higher level analysis is recommended.

3.4.4. Capacity

For the HCM analyses of uninterrupted flow facilities, capacity is set in terms of passenger cars per hour per lane (pcphpl). **Free-flow speed is estimated based on other variables, such as percent heavy vehicles, CAFs and SAFs, median type, and lateral clearance.**

For the HCM analyses of interrupted flow facilities, capacity represents the maximum number of vehicles that can pass a point during a specified time period under prevailing roadway, traffic, and control conditions.

The Q/LOS Handbook primarily relies on and reports capacity values based on the interrupted flow concept of capacity, with free-flow speed considered a roadway variable input. **For planning purposes, the assumed free-flow speed is 5 mph over the posted speed limit.**

3.4.5. Bus Frequency

For transit analysis purposes, the most significant assumption is that bus frequency is the single most important factor in determining the Q/LOS to transit users along a transit route segment or roadway facility. FDOT, in cooperation with the TCQSM authors and others, has incorporated that concept. Certainly, the LOS varies for individual transit users along a facility, but **in the determination of bus LOS along a transit route segment or roadway facility, the availability of buses is usually the more relevant performance measure.**

3.5. Arterial Analyses

ADJUSTED SATURATION FLOW RATE

Variables such as area type, speed limit, number of lanes, percent right turn lanes, percent heavy vehicles, median type, left turn lanes and population size have effects on adjusted saturation flow rates. Furthermore, as traffic queues get longer, traffic pressure affects capacity. These effects are included in FDOT's Generalized Service Volume Tables.

ADD-ON/DROP-OFF LANES

The add-on/drop-off lane (or expanded intersection) will contribute to intersection capacity, but not likely to the extent of a full through lane. The add-on/drop-off lane contains up to half the capacity of a full through lane. For any capacity benefit to be considered, two conditions should be met:

- the add lane and drop lane each must be at least 800 feet in length
- the add-on/drop-off pair combined must be at least 1,760 feet in length

For additional discussion, see [Section 4.3.1](#).

ONE-WAY STREETS

The Generalized Service Volume Tables include a factor that has been approved for the evaluation of one-way streets. Essentially, one-way pairs are assumed to have a 20 percent higher service volumes than corresponding two-way roadways with the same number of lanes.

LOS CRITERIA

The maximum control delay at a signalized intersection for LOS D is 55 seconds. While that value may be reasonable based on user perception in an urbanized area, in a small town or at an isolated intersection on a rural highway, that delay would be considered LOS F. To overcome this difference in user perception, FDOT has adopted different control delay criteria in rural undeveloped and rural developed areas. The criteria are one-half, rounded up, of the urbanized area criteria. For arterials in rural developed areas, arterial Class I LOS thresholds apply. These LOS criteria are embedded in FDOT's rural undeveloped and rural developed Generalized Service Volume Tables. The LOS criteria appear on the back of each table.

3.5.1 Pedestrian and Bus Analyses

PEDESTRIAN LOS

PLOS is determined by the methodology contained in this handbook. **The methodology is consistent and unchanged from the 2013 Q/LOS Handbook.** The pedestrian LOS adjustment factors as they relate to bus LOS are shown in [Table 3-2](#).

Table 3-2: PLOS Adjustment Factors on Bus LOS

Pedestrian Level of Service	Adjustment Factor
Pedestrian LOS A	1.15
Pedestrian LOS B	1.10
Pedestrian LOS C	1.05
Pedestrian LOS D	1.00
Pedestrian LOS E	0.80
Pedestrian LOS F	0.55

ROADWAY CROSSING DIFFICULTY

When catching a bus, transit users frequently have to cross a road. **Crossing difficulty is typically influenced by three broad factors: traffic signal density, crossing length, and vehicle volume.** It is more difficult to cross roadways with low signal densities than roadways with closely spaced, signalized intersections. Mid-block crossing difficulty increases with road width and lack of pedestrian refuges (i.e. restrictive or raised medians). Mid-block crossing difficulty also increases as the number of vehicles increase, which results in fewer gaps. These three broad factors and other major factors, such as vehicle speed, are interrelated. To account for crossing difficulty in a general way, FDOT's approach includes a set of roadway crossing adjustment factors which capture the crossing difficulty. **Roadway crossing adjustment factors are used to determine the adjusted bus frequency by applying a factor that captures crossing difficulty.**

PASSENGER LOAD FACTOR

Bus crowding plays a role in the user's perception of QOS, particularly on overcrowded buses when no seating is available. FDOT's approach includes a set of passenger load factors, which are applied to help determine the adjusted bus frequency value. **Passenger load factors are used to determine the adjusted bus frequency value by applying a factor commensurate to the level of passenger crowding.** These factors can be found in [Chapter 7](#) of this Q/LOS Handbook.

BUS STOP AMENITIES

Passenger comfort and safety within the passenger waiting areas play a role in user perception of the QOS and desirability of a transit system. FDOT's approach includes a set of bus stop amenity factors, which are used to help determine the adjusted bus frequency value. The factors can also be found in [Chapter 7](#) of this Q/LOS Handbook.

BUS STOP TYPE

Delay time at bus stops plays a role in travel times along routes, and thus impacts overall average travel speed. **FDOT includes a bus stop type adjustment factor, which is used to add 15 to 35 seconds of delay per route for typical and major bus stops, respectively.**

BUS FACILITY ANALYSIS

The TCQSM structure for Q/LOS analysis consists of points (e.g., bus stops), route segments, and systems. It does not include a facility analysis. Nevertheless, to maintain consistency, a method of aggregating segment-level bus frequency to facility-level was needed. At the generalized level, a simple average is acceptable. For example, if on a 3-mile facility, four buses serve the first 2 miles and two buses serve the last mile, then using a value of three buses $[(4 + 2)/2]$ is acceptable for a generalized level analysis.

4 Roadway Variables

Florida's Generalized Service Volume Tables are based on the HCM, TCQSM, and Florida roadway, traffic, control (signalization), and multimodal data. **The resulting tables are valid in Florida, and FDOT encourages the use of the generalized planning level approach.** Recognizing varying characteristics with the state and differing roadway, traffic, control, and multimodal characteristics, the Generalized Service Volume Tables are not adequate for all analysis needs. **Chapters 4 through 7** provide a description of input variables used in the development of the Generalized Service Volume Tables. Roadway variables describe the geometric and functional characteristics of a facility.

4.1. Roadway Type

Compatible with the terminology of the HCM, this Q/LOS Handbook is based on three major roadway types:

- Freeways
- Uninterrupted flow highways
- Interrupted flow roadways

Note: when using the Generalized Service Volume Tables, the number of lanes for arterials and other interrupted flow facilities should be determined at major intersections, rather than mid-block.

4.1.1. Freeways

Freeways are multilane, divided highways with at least two lanes for exclusive use of traffic in each direction and full control of ingress and egress.

4.1.2. Highways

Uninterrupted flow highways are roadways with a combination of roadway segments, which have average signalized intersection spacing greater than 2 miles and are not freeways. Because of the significantly different operating characteristics, these types of roadways are frequently also distinguished as two-lane highways and multilane highways.

4.1.3. Arterials

Interrupted flow roadways or arterials are characterized by signals with average signalized intersection spacing less than or equal to 2 miles. In this Q/LOS Handbook, signalized arterials are the predominant type of interrupted flow roadway. They primarily are operated by the state and serve through traffic. Also included in this category are signalized Non-State roadways, but not local streets. As used here, signalized intersections refer to all fixed causes of interruption to the traffic stream and may occasionally include stop signs or other control types.

Arterials are further classified based on posted speed. There are two arterial classes:

- Class I: Arterials with a posted speed of 40 mph or greater
- Class II: Arterials with a posted speed of 35 mph or less

4.2. Area Type

Four broad area type groupings are used in this Q/LOS Handbook, as shown in **Figure 4-1**:

- Core Urbanized areas (areas with a population of 1,000,000+) and Urbanized areas (other urbanized areas with a population of 50,000+)
- Transitioning areas (transitioning into urbanized areas)
- Urban areas (areas with a population of more than 5,000 not in urbanized areas)
- Rural areas (rural undeveloped areas or developed areas with less than 5,000 population)

Figure 4-1: Area Types



The area types in the Generalized Service Volume Tables correspond well with FDOT's LOS targets; however, there are a few special cases. **FDOT District LOS Coordinators should be consulted for applicable boundaries within their districts.**

There may be small lengths of roadways (e.g., approximately 6 miles for freeways, 3 miles for nonfreeways) between area types or adjacent to an area type that, from a logical and analytical sense, should be combined into one area type or another.

These situations typically occur with adjacent interchanges or in transitioning areas, but may also occur elsewhere. FDOT districts have the flexibility to adjust the area type boundaries or designate a roadway with a certain area

type under these circumstances.

As Florida’s population grows, area types may change for a specific location or roadway in future years. FDOT’s district offices (contact information available at <http://www.fdot.gov/info/moreDOT/districts/district.shtm>) should be consulted if analysts believe different area types are appropriate for a future study period.

4.2.1. Core Urbanized and Urbanized Areas

Core urbanized and urbanized areas are defined as approved boundary, which encompasses the entire Census Urbanized Area, as well as the surrounding geographic area likely to become urbanized within the next 20 years, as agreed on by FDOT, Federal Highway Administration (FHWA), and the Metropolitan/Transportation Planning Organization (MPO/TPO). **Core urbanized area types are distinguished by whether the area’s population is more or less than 1 million.** Currently, the grouping of more than 1 million applies to the MPO areas that include central cities: Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach. These are referred to as “core urbanized.” **The minimum population for an urbanized area is 50,000.**

Previously, core urbanized thresholds were developed by applying a different K factor to the urbanized design hourly volume (DHV) thresholds, but after careful consideration, it was noted that additional factors could be applied in the analysis process for a core urbanized area, such as speed and ramp density, and these should be considered. As a result, new DHV, directional design hourly volume (DDHV), and annual average daily traffic (AADT) thresholds were developed for core urbanized areas based on separate analysis from the urbanized thresholds. **The urbanized areas with less than 1 million population are referred to as “other urbanized.”**

4.2.2. Transitioning Areas

Transitioning areas are fringe areas that exhibit characteristics between rural and urbanized/urban. Transitioning areas are intended to include areas that, based on their growth characteristics, are anticipated to become urbanized or urban in the next 20 years.

Frequently, the Metropolitan Planning Area is used for the transitioning area adjacent to an FHWA Urbanized Area (Adjusted Census Urbanized Area Boundary). The definition of Metropolitan Planning Area mentions the “contiguous area expected to become urbanized with the 20-year forecast period.” It is the contiguous area that should be considered the transitioning area. However, in practice, most MPOs have not delineated those contiguous or transitioning areas, and many of the Metropolitan Planning Areas extend to remote rural areas of counties. When the MPO does not identify these transitioning areas, or areas adjacent to urban (but not urbanized) areas, FDOT districts, in cooperation with local governments, may delineate transitioning areas for LOS purposes.

Keeping the boundaries relatively consistent over time is desirable to achieve understanding by all potential parties. The transitioning boundary should be reviewed and adjusted as a part of the census cycle update, consistent with the setting of the FHWA Urbanized Area boundaries. It is appropriate to review the transitioning boundary in conjunction with a Long-Range Transportation Plan update. The FDOT District LOS Coordinators should be consulted for transitioning boundaries within their districts. It is recommended that boundaries for transitioning areas be based on the location of major roadways or at interchanges. This avoids portions of a freeway changing from transitioning to urbanized or rural between interchanges. It is desirable for an urban street to have the same designation between major roadways and not change mid-block when aligning the boundary with major roads is impractical.

4.2.3. Urban Areas

An urban area has a population between 5,000 and 50,000 and is not within an urbanized area. The boundaries for cities with populations over 5,000 and not within urbanized areas are primarily set by existing city limits and must be agreed upon by FDOT, the local government, and FHWA. However, the 5,000 population threshold is primarily a surrogate for areas that exhibit urban traffic characteristics. When a city has a population of less than 5,000 but the surrounding area has a population of more than 5,000 and the city has an urban character, then it is reasonable to classify it with a population of more than 5,000 in the Generalized Service Volume corresponding to a population of over 5,000. These are Generalized Service Threshold Volume Tables 2, 5 and 8 at the end of this handbook following the Glossary.

Other situations exist in which an area has a population of over 5,000 and yet, the area is more characteristic of a rural developed area. In this situation, it is reasonable to use the “developed areas less than 5,000 population” sections of Generalized Service Threshold Volume Tables 3, 6, and 9 included at the end of this handbook following the Glossary. In both of these situations, FDOT District Planning Offices, after consultation with the Central Office Systems Implementation Office, should determine the appropriate designation to use.

4.2.4. Rural Areas

Rural areas consist of two types:

- Rural undeveloped: areas in which there is no or minimal population or development
- Rural developed: areas consisting of cities and other populated areas with populations of less than 5,000 or along coastal roadways

Generally, the portion for cities or developed areas in Generalized Service Threshold Volume Tables 3, 6, and 9 should be applied to areas with a population between 500 and 5,000 and not immediately adjacent to urbanized, urban, or transitioning areas. This portion of the tables also should be generally applied to coastal roads not in urbanized, urban, or transitioning areas.

4.3. Number of Through Lanes

The number of through lanes is one of the most important variables to analyze a roadway’s capacity and LOS. Emphasis is placed on through lanes, or lanes that directly accommodate through traffic. The number includes shared lanes (e.g., through/right), but does not include exclusive turn lanes or two-way left-turn lanes on arterials, auxiliary lanes on freeways, or passing lanes on two-lane highways. Arterials are often described as having an odd number of lanes when two-way left-turn lanes are present. However, for highway capacity and LOS analyses, that is not appropriate. The two-way left-turn lane does not accommodate through vehicles, and the facility is more appropriately characterized as having an even number of lanes with a non-restrictive median.

Usually the total number of through lanes in both directions is used to describe roadways. However, this Q/LOS Handbook bases analyses upon a single peak direction. As an example, an LOS analysis for a six-lane freeway is based on three lanes, using the higher directional traffic volume. Similarly, an LOS analysis for a four-lane urban street would be based on two directional lanes.

A common question when using the Generalized Service Volume Tables is how do we handle odd number lanes along the facility. The Generalized Service Volume Tables contain adjustment factors based on certain

characteristics of the facility (i.e., turn lanes, medians, etc.). Any applicable adjustment factors are first applied and then the average service volumes are averaged.

For example, a rural undivided 5-lane arterial facility with exclusive left-turn lanes and without exclusive right-turn lanes will have an adjusted LOS C threshold of 35,388. This is calculated using the Generalized Service Volume Table 3. The LOS C thresholds for an undivided 4 and 6-lane arterial in a rural area is 29,300 and 45,200, respectively. To calculate the 5-lane LOS C threshold, first account for any applicable adjustment factors. For this example, the LOS thresholds must be adjusted by -5% for multilane arterials that have exclusive left-turn lanes and no exclusive right-turn lanes. After this adjustment is applied, the new 4 and 6-lane LOS C thresholds are 27,835 and 42,940, respectively. To obtain the final 5-lane LOS C threshold, the newly adjusted 4 and 6-lane LOS C thresholds, 27,835 and 42,940, are averaged to obtain the 5-lane LOS C threshold of 35,388 to be used in the analysis.

4.3.1. Arterials

An important aspect of this Q/LOS Handbook is the methodology for determining an arterial's number of through lanes. The ultimate result of the LOS analysis is a facility estimation of the LOS, and **it is widely recognized that signalized intersections are the arterial's primary capacity constraint; therefore, it is appropriate to place more emphasis on the intersections' characteristics than the mid-block characteristics.** Generally, mid-block segments have capacities far exceeding those of major intersections, and it is rare for significant delays to occur mid-block. By weighting the effects of intersections more heavily, a more accurate aggregate estimation is possible.

Site-specific characteristics (e.g., intensity and type of land use, driver behavior, speed, etc.) can dramatically affect the viability of add-on/drop-off pairs as through lanes; therefore, each approach should be examined on a case-by-case basis. Analysts are strongly cautioned to review all pertinent characteristics prior to adjusting the number of through lanes used. The reviews should be conducted during peak travel conditions. Analysts are encouraged to consult with their FDOT District LOS Coordinators prior to applying this concept. The following guidelines are offered as a capacity estimating tool only. This process should never be used for the design or redesign of an expanded intersection.

For any capacity estimation to be considered, two conditions should be met:

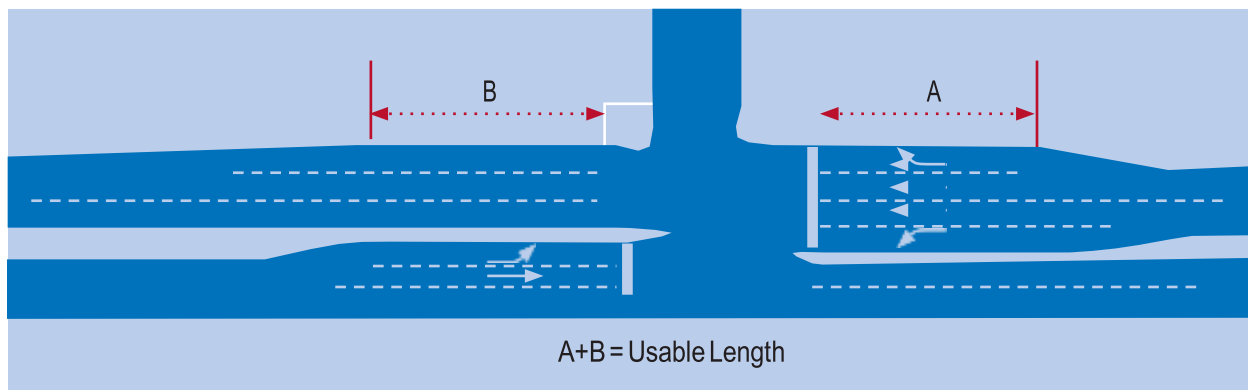
- The add and drop lanes must each be at least 800 feet in length
- The add-on/drop-off pair combined must be at least 1,760 feet in length

If either of these conditions is not met, then no additional capacity is assumed.

If the add-on/drop-off pair is at least one-third of a mile in length (roughly divided equally between approach and departure and exclusive of tapers and cross-street width, as represented by A+B in [Figure 4-2](#)), it may be reasonable to consider an additional one-half lane for capacity purposes. For example, in the accompanying diagram, if A = 1,000 feet and B = 1,000 feet, then it would be reasonable to consider that the intersection approach has 2.5 effective through lanes.

With a length of at least one-half mile (roughly divided equally between the add and drop lanes), it may be reasonable to consider the add-on/drop-off pair as adding up to one full through lane.

Figure 4-2: Usable Length

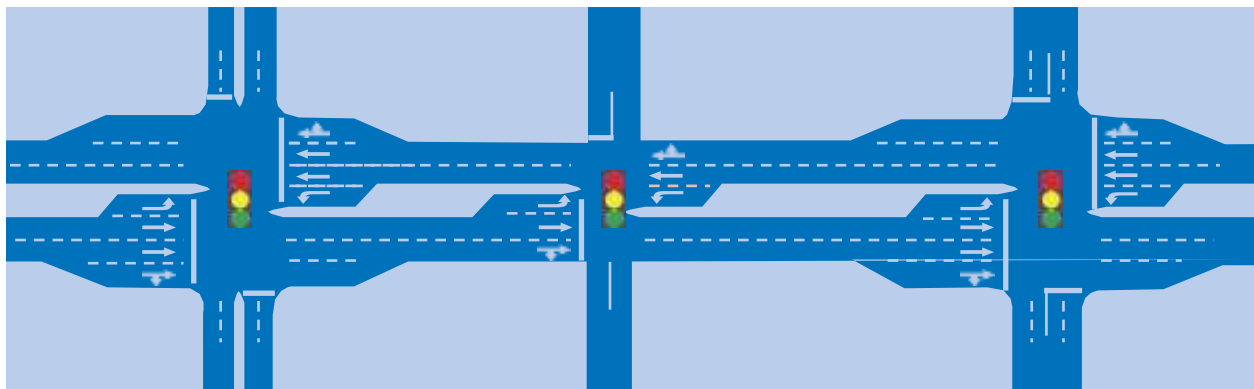


When using the Generalized Service Volume Tables, the number of through lanes on a facility is typically determined by the through and shared through/right lanes at major intersections rather than mid-block.

Figure 4-3 shows the mid-block segments with four lanes, with two lanes in each direction. The major intersections each have six lanes, with two through and one shared through/right add-on/drop-off lane with tapers adequate for safe merging.

In this illustration, as in many cases, minor signalized intersections have green times so heavily weighted to the major urban street that they do not cause significant delays to through traffic. When this is the case, it is sometimes acceptable to disregard the number of lanes at these minor intersections; instead, the determination should be based on the lanes at major intersections. So in terms of the LOS, this particular facility has six lanes.

Figure 4-3: Example of Six-Lane Roadway



4.3.2. Highways

For uninterrupted flow highway facilities, the number of lanes is the basic segment or mid-block laneage. For example, a two-lane highway, which is widened to four lanes at major intersections, should be considered a two-lane highway.

4.4. Speed

4.4.1. Posted Speed

The maximum speed at which vehicles are legally allowed to travel over a roadway segment.

4.4.2. Free-Flow Speed

Free-flow speed is the average speed of vehicles not operating under the influence of speed reduction conditions. In general, free-flow is the average speed under low-flow conditions and not influenced by control conditions, such as signalized intersections. The assumption used in this handbook is that the free-flow speed is 5 mph above the posted speed. As an example, if an arterial has a posted speed of 40 mph, the default free-flow speed used is 45 mph; however, if a more accurate free-flow speed is available, it should be used.

4.5. Median Type

4.5.1. Arterials

As used in this document, medians may be classified in one of three ways:

- restrictive median (r)
- non-restrictive median (nr)
- no median (n)

A restrictive median is a raised or grassed area normally at least 10 feet in width separating opposing mid-block traffic lanes and includes left-turn lanes.

A non-restrictive median is a painted at-grade area normally at least 10 feet in width separating opposing mid-block traffic lanes, and for arterials, accommodates mid-block left-turning vehicles to exit from through lanes. Continuous two-way left-turn lanes are considered a non-restrictive median under this definition. Situations in which restrictive or non-restrictive medians are less than 10 feet wide are considered as having no median.

FDOT included the median factor to account for lowering mid-block average travel speeds when no median is present. From the aspect of getting left-turning vehicles out of the traffic stream, the difference between a restrictive and a non-restrictive median is relatively inconsequential. Thus, in determining automobile LOS, restrictive and non-restrictive medians are treated the same.

From a pedestrian point of view, there is a significant difference between non-restrictive medians and restrictive medians. Restrictive medians give pedestrians a much safer mid-block crossing. Thus, this type of median is a consideration in determining the pedestrian crossing factor that enters the bus LOS analysis. **A non-restrictive median provides no pedestrian refuge.**

A pedestrian refuge is an area at least 5 feet but less than 10 feet in width (not a full, raised median) separating opposing mid-block traffic lanes and allowing pedestrians to cross the roadway more safely and comfortably. From a pedestrian point of view, a pedestrian refuge has nearly the same benefit as a restrictive

median. In terms of pedestrian crossing difficulty, the difference between a restrictive median and pedestrian refuge is relatively small; therefore, in determining pedestrian crossing difficulty, the two may be treated the same.

Pedestrian refuges are not included as a distinct category. If an analyst needs to evaluate the effects of a pedestrian refuge, it should be treated as a restricted median for transit analysis, but as no median for automobile analysis.

4.6. Exclusive Turn Lanes

4.6.1. Arterials

EXCLUSIVE LEFT-TURN LANES

The exclusive left-turn lanes are reserved for the exclusive use of left-turning vehicles. The length of these lanes must accommodate turning demand such that left-turn traffic (1) is able to enter the turn lanes behind through queues or (2) can be stored in the turn lane to ensure the through lane traffic is not blocked. When left-turn lanes are not present, a shared lane exists which is included in the number of through lanes.

When analyzing arterials without left-turn lanes, the use of the Generalized Service Volume Tables is discouraged in all but the most basic analyses. If used, the Generalized Service Volume Tables include adjustment factors for the absence of left turn-lanes. To account for the absence of left-turn lanes, adjustment factors provided in the Generalized Service Volume Tables must be manually applied to the service volumes. However, the user is cautioned that research indicates that the true value of the reduction is highly dependent on the distribution of traffic volumes among all the various movements, and a constant reduction factor, as used in the tables is not accurate.

Storage length refers to the total amount of storage available for left-turning vehicles, measured in feet. The default value is 235 feet. For new turn lanes, FDOT Design Standards must be consulted (found at <https://www.fdot.gov/design/standardplans/DS.shtm>).

EXCLUSIVE RIGHT-TURN LANES

Exclusive right-turn lanes are storage areas designated to exclusively accommodate right-turning vehicles.

The length of these lanes must be able to accommodate turning demand to allow for the free flow of the through movement. The number of pedestrians crossing at these locations should also be considered and accommodated.

4.7. Roadway Lengths

To properly apply the Generalized Service Volume Tables, it is necessary to partition roadways into appropriate lengths for analysis. Setting lengths too short may not adequately capture traffic flow characteristics. Vehicles will not achieve the same average running speed on a segment as over a longer facility length. Short lengths would also be subject to bias caused by signal control delay.

Furthermore, analysis results would not conform to the concept of LOS that is based on the driver perception of the operation of roadways and may not show where the most significant impact of proposed development traffic will occur. Conversely, setting lengths too long may dilute the impact of hot spots by averaging them into other portions that operate better.

FDOT District LOS Coordinators have primary responsibility for the segmentation of the State Highway System (SHS) for LOS purposes. FDOT Central Office may combine smaller segmentation lengths of a facility for statewide reporting and other purposes.

In general, the partitioning of roadways for facility analyses should be based on the following considerations, ranked in order:

- Highway system structure (including facility type, number of lanes, etc.)
- Area type boundaries
- Lengths
- AADTs

At the local level, government agencies frequently make highway capacity and LOS termini at their own jurisdictional boundaries, regardless of the appropriate facility length and termini considerations described above. Jurisdictional boundaries by themselves are usually not appropriate termini for capacity and LOS analyses. Local governments are encouraged to consult with FDOT District LOS Coordinators for applicable segmentation within their jurisdictional boundaries.

4.7.1. Arterials

For an arterial facility analysis, the general recommendation is that the facility be at least two (2) miles in length to use the service measure of average travel speed. Major intersecting arterials frequently serve as logical breaks in segmenting the arterial facility. In downtown areas, the general recommended length is at least one (1) mile.

When evaluating arterial section or facility LOS for planning, the roadway should begin and end at a signalized intersection. The following guidance is provided for some special cases:

- (1) Interchanges along an arterial: At a generalized planning level, it is typically appropriate to make a break at an interchange (highway system structure criterion) that does not include a signalized intersection.
- (2) Boundaries, especially urbanized area boundaries: When a signalized intersection lies just outside the boundary, it is proper to extend an analysis to the next signalized intersection if within 2 miles of a boundary for a conceptual planning analysis. For example, if a signalized intersection lies 1 mile beyond the existing urbanized boundary in a transitioning area, it is appropriate to include that signalized intersection and the 1 mile of transitioning area as part of an urbanized area analysis.

5 Traffic Variables

This chapter provides an overview of key traffic variables used in the development and use of the Generalized Service Volume Tables.

5.1. Volume and Demand

Traffic volume is the most basic of all traffic parameters and is generally defined as the number of vehicles passing a point on a transportation facility during a specified time period. Traffic volumes typically are developed separately from capacity/LOS analyses and provide input to those analyses. Various sources that determine traffic data include:

- FDOT's Florida Traffic Online (FTO) Web Application
- Extrapolation of historical growth trends
- FDOT's travel demand forecasting models
- Institute of Transportation Engineers (ITE) Trip Generation Manual

The sources listed below provide guidance on traffic forecasting and analysis:

- [FDOT's Project Traffic Forecasting \(PTF\) Handbook](#)
- HCM, Sixth Edition
- FDOT's Traffic Analysis Handbook

Volume is the parameter most often used to quantify traffic demand. **Traffic demand is the number of vehicles with drivers who desire to traverse a particular highway during a specified time period. While traffic demand expresses a desire, volume typically represents actual measurement.**

Misuse of measured volumes often occurs in capacity/LOS analyses causing traffic studies to report the observation and measurement of conditions as they presently exist. Current observations do not reflect constraints in the existing highway system that may prevent vehicles from accessing a desired segment of the system at any given point in time. Observed volumes on congested facilities are more a reflection of capacity constraints than of true demand.

Measured traffic volume cannot theoretically exceed roadway capacity, but traffic demand volume can exceed capacity. An example of a common misinterpretation of these two distinct terms typically occurs while collecting traffic data at an oversaturated intersection. The traffic volume that can physically be processed through a traffic signal is a measure of the capacity (or supply). When traffic volumes approach roadway capacity, the transportation system may experience abnormally long vehicle queues and excess vehicular delay. The length of the vehicle queue upstream of a traffic signal is a more accurate measure of the traffic demand that cannot be processed in the one-hour analysis period.

The impact of bottlenecks, alternative routes, latent demand, and future growth further complicates the relationship between measured traffic volume and traffic demand. **If questions arise as to the appropriateness of using measured volumes or demand volumes for capacity and LOS analyses, it is clear demand volumes should be used.**

5.2. Annual Average Daily Traffic (AADT)

AADT is the total volume of vehicle traffic on a highway or roadway segment for one year divided by the number of days in the year. Most planning applications require AADT volumes. Determining AADT values is a separate process and distinct from capacity/LOS analyses. FDOT routinely provides AADT values for state roads.

AADT values are easy to confuse with two other traffic count numbers that are used to estimate AADT. **The average daily traffic (ADT) is the total traffic volume during a given time period, more than a day and less than a year, divided by the number of days in that time period.** ADT is generated from a short-term traffic count and can be used to estimate AADT. Ensuring ADT counts are reflective of the normal average traffic is an important consideration when using them to estimate AADT on the roadways. Traffic taken during a four-day holiday, long weekend, or Saturday night when 50,000 or more football fans gather is not a normal occurrence.

Peak season weekday average daily traffic (PSWADT) is the average weekday traffic during the peak season. PSWADT numbers are normally generated by travel demand forecasting planning models, such as Florida Standard Urban Transportation Model Structure (FSUTMS). Like ADT, they can be converted to AADT by an adjustment factor.

FDOT operates two types of traffic monitoring programs: 1) continuous monitoring at selected locations using permanently installed equipment and 2) coverage counts at many temporary or short term sites using portable equipment. Further information about the traffic monitoring programs can be found in the FDOT PTF Handbook.

There are two count adjustment factors used to calculate AADT. The first, **axle correction factors are used to compensate for an axle counter's tendency to count more vehicles than are actually present.** For example, an axle counter would show a count of two when a four-axle truck runs over the sensor, even though only one vehicle is present. The second, **seasonal adjustment factors have been developed to adjust for the variation in traffic over the course of a year.** The peak season is the 13 consecutive weeks with the highest volumes. The weekly seasonal factors for those weeks will be the lowest, and the factors will be the highest for the weeks with the lowest volumes. The seasonal factor is used as follows:

$$\text{AADT} = (\text{short-term traffic count}) \times (\text{seasonal factor}) \times (\text{axle correction factor})$$

Although, for planning purposes AADT is usually used, actual capacity and LOS analyses are conducted on an hourly or sub-hourly directional basis. All of FDOT's Generalized Service Volume Tables are based on peak hour directional roadway, traffic, control, and multimodal characteristics. FDOT's hourly directional tables may be viewed as the most fundamental of the tables, because the daily tables are created by dividing the peak hour directional values by the directional distribution factor (D) and the planning analysis hour factor (K). Although the determination of AADT is outside the capacity/LOS analyses, the determination of K and D is a fundamental part of capacity/LOS analyses in planning stages because of the need to convert AADT to peak hour directional volumes.

5.3. Planning Analysis Hour Factor (K)

The K factor is the ratio of the traffic volume in the study hour to AADT. Historically, FDOT has used a variety of study hours and K factors depending on the application. Frequently used K factors included the 30th highest volume hour of the year (K30), 100th highest volume hour of the year (K100), highest hourly volume to daily volume (Kp/d), 5–6 p.m. weekday volume to AADT (K5-6pm), average p.m. weekday peak volume to AADT (Kpm), average a.m. peak weekday volume to AADT (Kam), and noon weekday volume to AADT (Knoon). In general, K factors

are used for peak hour traffic analyses, but analyses can also be based on low-volume conditions, such as the analysis of truck travel in early morning hours. Roadway, traffic, and control conditions vary considerably during the day, potentially affecting capacity values and service volume thresholds.

Standard K is the primary planning analysis hour factor used in Florida, and the value is set based on the area type and facility type. The use of Standard K represents a design approach in which the K factor for a roadway is established from the planning phase through the design phase of the project development process. Rather than being a variable, Standard K values are a fixed, cost-effective parameter, much like the use of 12-foot through lanes on major, high-speed roadways. Unless otherwise noted, all references in this Q/LOS Handbook that refer to a study hour or K factor refer to Standard K.

The Standard K factor is used to convert a peak hour volume to an AADT and vice versa. The Standard K factors used in the Generalized Service Volume Tables were obtained through a methodical process to obtain representative Standard K factors. On the freeways in the seven largest urbanized areas in Florida (Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach), Standard K represents a peak study period. For all other facilities, Standard K represents a peak hour not within the peak season. Standard K Factors for planning and design analysis are not directly applicable to the Turnpike, other toll roads, and managed lanes. For more information on the K Factors, refer to FDOT's PTF Handbook.

The K factor generally drops as an area becomes more urbanized and high traffic volumes are spread out over longer time periods. If adequate documentation is provided, FDOT would consider deviations from the Standard K table for special facility types.

The recommended Standard K factors can be found in the FDOT PTF Handbook and the analyst must refer to the PTF Handbook for use of appropriate K factors in projects. The K values used in development of the Generalized Service Volume Tables included in this handbook are consistent with the PTF Handbook. They are listed below:

- Urbanized (Core urbanized/Core freeways)
 - Freeways: 0.09 (0.085)
 - Highways: 0.090
 - Arterials: 0.090
- Transitioning
 - Freeways: 0.098 (average of Transitioning to Urbanized Areas and Urban)
 - Highways and arterials: 0.090
- Rural developed and rural undeveloped
 - Freeways: 0.105
 - Highways and arterials: 0.095

Standard K values on freeways in large urbanized areas range from 8.0 to 9.0 percent, while Standard K values on these “core freeways” in large urbanized areas are typically lower in this range. The lower K values signify a peak period, as opposed to a peak hour. The urban core freeway K values in large urbanized areas are available on [FDOT FTO Web Application](#) managed by FDOT's Transportation Data and Analytics (TDA) Office.

5.3.1 Multimodal Transportation Districts (MMTD)

The purpose of MMTDs is to encourage desirable transportation environments for all users, including transit passengers, pedestrians, cyclists, and motorists. The designation of such districts recognizes the inherent, integral relationship between transportation, land use, and urban design and the degree to which each of these elements affect the others. Local governments opting to designate an MMTD assign secondary priority to vehicle mobility and primary priority to assuring a safe, comfortable, and attractive pedestrian environment, with convenient connections to transit. FDOT supports local governments that are committed to such efforts. Implementing MMTDs should help foster the use of multiple modes of transportation, leading to a reduction in automobile use while maintaining high mobility characteristics in the area.

The primary way FDOT supports these designated areas is through its LOS targets. FDOT promotes lower acceptable automobile travel speeds for longer durations in the planning, design, and operations of its facilities.

5.4. Directional Distribution Factor (D)

The peak hour D factor is the proportion of an hour's total volume occurring in the higher volume direction.

The preferred approach to obtain D factor data is from the FTO Web Application, which provides a D factor for all state roads. The FTO Web Application reports the average of measured D values around the 200th highest hour from nearby and comparable roadway sites. The statewide minimum acceptable D factor is 0.51 (this is not the default value and should only be used in an LOS analysis if adequate justification is provided for the specific roadway). The D factor of 0.55 was used in the Generalized Service Volume Tables for all facility and area types. Using such an approach provides statewide consistency and reasonable accuracy in the values indicated and at a minimum cost. Additional guidance and the recommended range of D factors can be found in the FDOT PTF Handbook.

5.5. Peak Hour Factor (PHF)

The peak hour factor (PHF) is the hourly volume divided by the peak 15-minute rate of flow within the peak hour, specifically:

$$PHF = \frac{(Hourly Volume)}{4(Peak 15 - minute)}$$

The planning-level approach for addressing volume variations within the study hour has been adopted within this handbook. PHF based on area type were used to develop the vehicular service volumes in this Q/LOS Handbook. The PHF associated with each area type is:

- Urbanized areas: 0.95
- Transitioning/urban areas: 0.92
- Rural areas: 0.88

The PHF associated with the area type is consistent with the sixth edition of the HCM. For more information on the PHF, refer to FDOT's PTF Handbook.

5.6. Base Saturation Flow Rate

The HCM uses the term “base saturation flow rate” for interrupted flow roadways and capacity, or base capacity, for uninterrupted flow roadways to describe the maximum steady flow. **Base saturation flow rate is the maximum steady flow rate, expressed in pcphpl, at which passenger cars can cross a point on interrupted flow roadways.** These are not the same as capacity, as normally used to define how many vehicles a roadway can reasonably accommodate. The base saturation flow rates/capacities for Florida’s roadway facilities are:

- Arterials and other interrupted flow facilities: 1,950 pcphpl (assuming 100 percent green time)
- Basic freeway segment (70 mph free flow speed): 2,400 pcphpl
- Uninterrupted flow multilane highway segments (60 mph free flow speed): 2,200 pcphpl
- Uninterrupted flow two-lane highway segments: 1,700 pcphpl

5.7. Heavy Vehicle Percent

The FHWA has a vehicle classification scheme in which vehicles larger than a pickup truck are considered heavy vehicles. This includes vehicles with more than four wheels or a classification group of four or higher. **The percentage of these heavy vehicles in a given hour is frequently referred to as a truck factor (T).** However, to be more consistent with HCM terminology and to overcome some definitional problems with the common understanding of the meaning of a truck, this Q/LOS Handbook uses the term “heavy vehicle” and makes use of the percent of heavy vehicles in a given hour.

The heavy vehicle percentage varies dramatically by the time of day, day of week, roadway type, and adjacent land uses. Operational characteristics of heavy vehicles also vary dramatically by type of heavy vehicle (e.g., a relatively small delivery truck compared to a fully loaded 18-wheel semi-truck) and whether they are operating on an uncongested freeway or on signalized roadways. The blast effect of heavy vehicles on bicyclists also varies significantly based on the type and speed of heavy vehicles.

5.8. Speed and Capacity Adjustment Factors

The HCM 6th Edition has replaced the local adjustment factor (LAF) with the SAF and CAF. The LAF previously provided an adjustment to capacity to account for driver aggression, hurriedness, and familiarity with the facility.

The SAF is used to adjust the speed of a facility based on a combination of sources, including weather and construction work zone effects. The SAF may also be used to calibrate the estimated free-flow speed for local conditions or other effects that contribute to a reduction in free-flow speed.

The CAF is used to adjust the capacity of a facility for reduced-capacity situations or to match field measurements. The capacity can be reduced to represent situations such as construction and maintenance activities, adverse weather, traffic incidents, and vehicle breakdowns.

The SAF and CAF can be used to adjust for driver familiarity (or unfamiliarity) with the facility. Additionally, these adjustment factors are used to calibrate a roadway to existing conditions. For the Generalized Service Volume Tables analysis, an SAF of 0.975 and a CAF of 0.968 was assumed for all analyses and area types. These values are derived from the HCM 6th Edition.

5.9. Percent Turns from Exclusive Turn Lanes

Percent turns from exclusive turn lanes is the percent of vehicles approaching an intersection served by an exclusive turn lane or lanes. More specifically, the percent left turns is the percentage of vehicles performing a left-turning movement at a signalized intersection, and the percent right turns is the percentage of vehicles performing a right-turning movement at a signalized intersection. Typically, the percent turns from an exclusive lane is the percent of traffic using an exclusive left-turn lane, with traffic predominantly moving straight ahead.

Some of the most complicated calculations within the HCM chapter on signalized intersections deal with accommodating left-turn movements. **The Generalized Service Volume Tables assume that left-turn lanes adequately serve left-turning vehicles.** In other words, the base condition assumes there is no queue spillback from the left-turn lane into the adjacent through lanes. If this assumption cannot be made, results obtained from the planning analysis tools are possibly inaccurate. For these reasons and more, the tables should not be used for intersection design or detailed traffic operations analysis.

The automobile LOS methodology described in this Q/LOS Handbook applies the HCM procedures to through traffic at each signalized intersection. Turning movement adjustments are made internally, based on the user-specified value of percent turns from exclusive lanes. Turning volumes are added to the through volumes to determine the overall service volumes shown in the Generalized Service Volume Tables.

The accuracy of LOS calculations is highly dependent on the percent turns from exclusive turn lanes. Although it is typically of moderate importance, at some key intersections, it may be one of the most significant variables. While FDOT does not routinely suggest acquiring percent turns from exclusive turn lanes, data collection should be considered at key intersections. Furthermore, some FDOT districts may require specific counts. If the percent turns at key intersections are obtained in the field, a value of 10 percent may be assumed for the other intersections, assuming an exclusive left-turn lane and no exclusive right-turn lane. If the percentage of turns from exclusive turn lanes is acquired, the turning movement count should be conducted during the peak hour, as illustrated in **Table 5-1**.

Table 5-1: Calculation of Percent Turns from Exclusive Turn Lanes

Measured Day	Peak Hour	Signalized Intersection	Total Peak Hour Predominant Approach Volume	Exclusive Lane Volume	% Turns from Exclusive Turn Lanes	
					A	B
22-Jan	4-5 PM	A	884	130	14.7%	16.7%
		B	900	150		
23-Jan	5-6 PM	A	1,152	150	13.0%	13.0%
		B	1,150	150		
24-Jan	5-6 PM	A	1,102	150	13.6%	14.7%
		B	1,090	160		
Totals	—	A	3,138	430	13.7%	14.6%
		B	3,140	460		

SPECIAL TURNING MOVEMENT CASES

There are two special cases when dealing with turns from exclusive lanes. The first is when the predominant movement is a turn movement instead of the straight-ahead movement. The second involves T intersections.

In **Figure 5-1**, the predominant movement is the left-turning movement, and the 550 vehicles turning left should be considered the through movement. The 200 vehicles going straight ahead should be treated as left-turning vehicles with 20 percent left turns $[(200/(550 + 200 + 250))]$ from an exclusive left-turn lane. The 250 vehicles turning right should be treated normally, with 25 percent right turns $[(250/(550 + 200 + 250))]$ from an exclusive right-turn lane.

In **Figure 5-2**, all vehicles are turning from exclusive turn lanes at a T intersection. The 600 vehicles turning right is the predominant movement and should be considered through vehicles. The 400 vehicles turning left should be treated normally, which is to say there are 40 percent left-turns $[400/(400 + 600)]$ from an exclusive left-turn lane.

In **Figure 5-3**, another T intersection is shown, featuring a shared left/through lane in addition to the predominant movement served by the exclusive right lane. Normally, a shared left/through lane does not have the same capacity as a through lane because of the effect of opposing vehicles blocking permitted left turns for the main movement. However, in this case, there is no opposing movement, and the capacity of this shared lane is virtually the same as a typical through lane. In this situation, an analyst should assume one through lane and one shared through lane with 20 percent left turns $[(200/(200 + 200 + 600))]$.

Figure 5-1:
Predominant Turning Movement

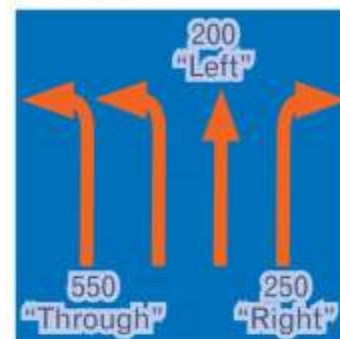


Figure 5-2:
Through Movement at a T Intersection with Exclusive Lanes

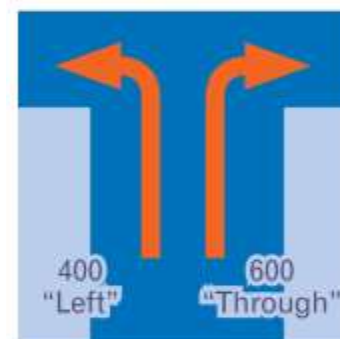
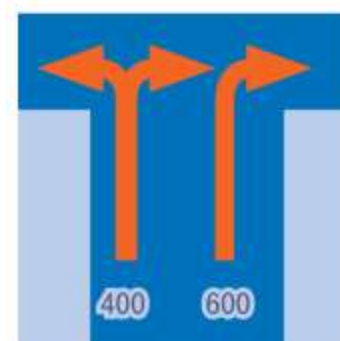


Figure 5-3:
Through Movement at a T Intersection with Shared Lanes



6 Control Variables

This chapter provides an overview of each control variable used to generate the Generalized Service Volume Tables.

Control variables refer to roadway or area traffic controls and regulations in effect for a roadway point or segment, including the type, phasing, and timing of traffic signals, stop signs, lane use and turn controls, and other similar measures. In this Q/LOS Handbook, control variables refer to those regularly occurring at signalized intersections, unless otherwise noted. For uninterrupted flow facilities, such as freeways and highways, the LOS can readily be derived from the volume of vehicles and roadway capacity, and control variables are not applicable. For signalized roadways (interrupted flow), however, v/c is not sufficient to determine the LOS, and control variables must be considered. These include:

- Number of signals
- Arrival type
- Cycle length
- Effective green ratio (g/C)

The Generalized Service Volume Tables use default control variables that are representative of typical conditions on Florida roadways. The default control variables (or characteristics) — along with the roadway, traffic, and multimodal variables assumed in the creation of each table — are provided on the back of the Generalized Service Volume Tables.

Table 6-1 provides an overview of the control variable input requirements within the Generalized Service Volume Tables.

Table 6-1: Control Variable Input Requirements

	Input Variable	Generalized Service Volume Tables
CONTROL	Number of Signals	D
	Arrival Type	D
	Signal Type	D
	Cycle Length (C)	D
	Through Effective Green Ratio (g/C)	D
	Exclusive Left Effective Green Ratio	D

Legend: D Default variables that cannot be altered

The effects that individual variables have on the computational process vary. **Table 6-2** indicates the sensitivity of the control variables on capacity and LOS.

Table 6-2: Sensitivity of Control Variables on Service Volumes

Control Variable	Sensitivity on Service Volumes
Number of Signals	high
Arrival Type	medium
Signal Type	low
Cycle Length (C)	medium
Through Effective Green Ratio (g/C)	high
Exclusive Left Effective Green Ratio	medium

Traffic variables, including AADT, Standard K, and D data, should be obtained from FDOT's FTO, PTF Handbook and field counts. Although turning movement counts at key intersections may be necessary, as discussed previously, FDOT does not recommend the use of travel time studies for LOS planning applications.

Field visits should be conducted to collect traffic and other items needed for analyses. Up-to-date aerial or satellite imagery may be sufficient for most of the data entry items. Signalization information is often available from the applicable traffic operations agency's signal timing plans. The applicable transit agency should be contacted for transit data.

6.1. Number of Signals

The cumulative effect of numerous traffic signals, lack of green time, and lack of effective signal progression often have a detrimental effect on the LOS of arterials. An important feature of FDOT's Generalized Service Volume Tables is the inclusion of the number of signals on the determination of the LOS.

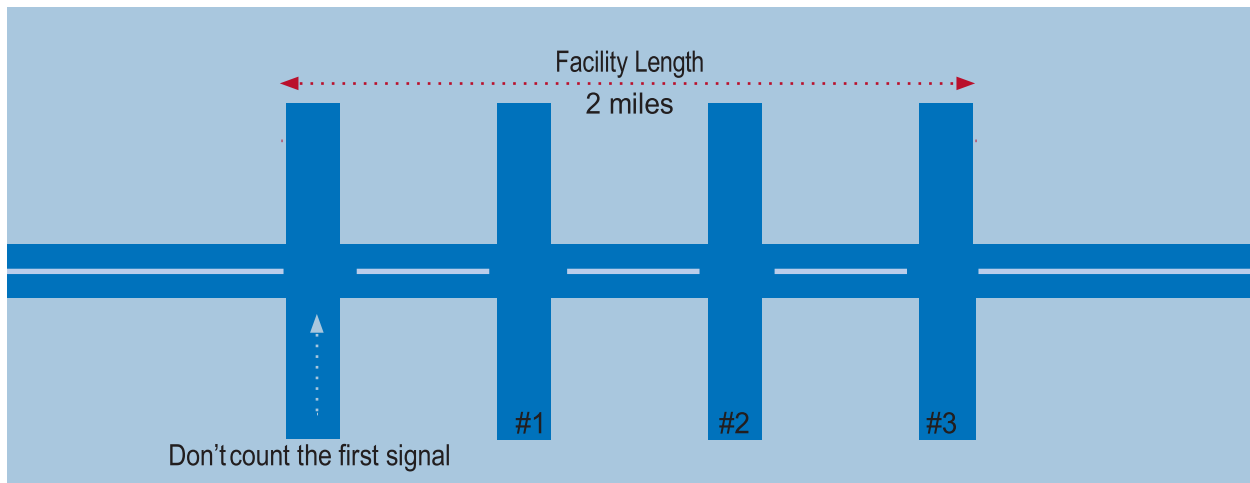
The distance between signalized intersections is required to determine specific service volumes for a roadway. FDOT's Generalized Service Volume Tables use signalized intersections per mile as an input and assume uniform spacing. While this approach may be acceptable for an areawide analysis, precise distances between signalized intersections should be determined when an individual roadway is analyzed at the conceptual planning level.

For analysis purposes, 100 feet between signalized intersections is considered the minimum distance. When the actual distance is less than 100 feet (e.g., side streets with wide medians), it is reasonable to consider these together as one signalized intersection.

Roadway and traffic characteristics often change over time. The number of signals per mile is frequently the most significant change. As development takes place and an area becomes more urbanized, the number of signals per mile is likely to increase. The LOS analysis of future conditions should, therefore, take into account changes in roadway and signalization characteristics.

To avoid double counting when determining the number of signals, only one intersection at the ends of the facility should be counted, as shown in **Figure 6-1**. In general, FDOT recommends including the last intersection within the analysis and ignoring the first, or entry, intersection. This allows the analysis to include the effects of delay, backup, and the LOS from the last intersection for the facility under study.

Figure 6-1: Total Number of Signals



For example, in southeast Florida, principal arterials are often spaced 1 mile apart, with other signalized intersections in between. In this situation, only one of the signalized intersections at the ends of the roadway, plus the signals in between, should be counted when determining the number of signals per mile. In general, the last signalized intersection in the peak flow direction would be counted, ignoring the first signalized intersection.

As discussed previously, the arterial should begin and end at a signalized intersection. In unusual situations when this assumption is not applicable (e.g., lane drops, ramp junctions, etc.), the following guidance is provided:

- For the Generalized Service Volume Tables, do not count the unsignalized terminus as a signalized intersection.

In general, only fixed, periodic interruptions should be considered in determining the number of signals.

Only one intersection at the ends of the facility should be counted. Draw bridges, at-grade railroad crossings, school zones, pedestrian crossings, and median openings should not be counted. Depending on the site-specific conditions or analysis desired, there may be exceptions to this general guidance.

When using the Generalized Service Volume Tables, an intersection with a stop sign for the through movement is considered a signalized intersection for a state-signalized arterial. When analyzing a Non-State signalized roadway, the roadway must have at least one signalized intersection.

6.2. Arrival Type

Arrival type is a general categorization of the quality of signal progression. The HCM defines six arrival types, with Type 1 representing the worst progression quality and Type 6 representing the best. Uncoordinated operation, or random arrivals, is represented by Type 3 and is appropriate for actuated signals. Arrival Type 4 is FDOT's default for coordinated signal systems. A more favorable progression (Types 5 or 6) may be appropriate when progression design strongly favors the peak direction of travel, and all signals are coordinated for the length of the facility. One-way facilities tend to have better quality progression than two-way facilities. A higher level of progression may also be appropriate around freeway interchanges, where signals are typically highly coordinated. The arrival type may vary significantly from one signal to the next, even in coordinated signal systems. Actuated-coordinated signals have varying green times, with breaks between groups of coordinated signals.

The assumption of very good progression in one direction does not imply efficient progression in the other direction. Even with less traffic volume, off-peak direction speeds could be lower, if favorable progression has been established for the peak direction only.

6.3. Signal Type

The signal type indicates the degree to which a traffic signal's cycle length, phase plan, and phase times are preset or actuated. The three main types are:

- Actuated
- Actuated-coordinated
- Pretimed

It should be noted that modern traffic signals can handle multiple settings and can vary by time of day. Consequently, a traffic signal's operation (actuated, coordinated-actuated, or pretimed) can change by the time of day to best meet traffic demands.

6.3.1. Actuated

Actuated, or fully actuated signals, use vehicle detection for all signal phases on the main and side street approaches. Each phase is subject to a minimum and maximum green time, and some phases may be skipped if there is no demand for the phase. The length of the green time observed in the field generally depends on the amount of vehicular demand for the phase. If there is little demand, then a relatively short green time will be allocated to the phase. If there is significant demand, a relatively long green time will be allocated, subject to the maximum green time for that phase. The minimum and maximum green times for each phase can be easily changed by entering new values into the traffic signal controller.

Because phases can be skipped, and the amount of green time for each phase generally depends on demand, the cycle length will often vary substantially from cycle to cycle. The exception occurs during periods of heavy vehicular demand, when all phases consistently reach their maximum values, making it seem as if the cycle length is fixed. Actuated signal operations are most frequently used when the signalized intersection is isolated, or when there is a desire to minimize delay without concern for progression.

6.3.2. Actuated-Coordinated

A subset of actuated control is referred to as actuated-coordinated control. **In this type of signal operation, the cycle length is typically fixed, while the amount of green time for the main street through phase varies.** It consists of a minimum amount of green time plus any unused time from the minor phases. Holding the main street green in this manner at all of the signals along a facility allows platoons of vehicles to move relatively unimpeded along the main street with decent progression. Actuated-coordinated signal operations are typically used in Florida's developed areas, especially during peak travel times. This type of operation typically offers the best balance of capacity and progression for the main street through movement.

6.3.3. Pretimed

Pretimed signals use a preset sequence of phase times in a repetitive order and make no use of vehicle detection. Each phase is green for a fixed period of time, irrespective of vehicular demand, and none of

the phases can be skipped. Thus, the cycle length is fixed. This type of signal operation is most frequently used in downtown areas with high signal density, or when the desire is to maximize progression without extensive concern about maximizing capacity for the through movement.

6.4. Cycle Length (C)

Cycle length (C) is the total time for a signal to complete a sequence of signal indications for all traffic movements. The cycle lengths used in the development of the arterial service volume tables were based on representative cycle lengths for different functional classifications of arterials and for different area types. Cycle lengths are typically highest on principal arterials in urbanized areas, where the primary purpose of the facility is to provide a high level of mobility to through movements on the mainline and where roadways are typically at or near capacity during peak periods. Lower cycle lengths are typically used for the less saturated conditions typical of rural areas to provide better access and service to all directions. The cycle lengths used to develop the Generalized Service Volume Tables are provided on the back of each table.

6.5. Effective Green Ratio (g/C)

One of the most significant variables used in calculating the highway capacity and LOS on a signalized roadway is the through movement's effective green time (g) to signal cycle length ratio (g/C). It is the amount of time allocated for the through movement (typically calculated as the green plus yellow plus all-red indication times less the lost time) divided by C. Along with the number of through lanes, it is usually one of the two most important factors for determining the capacity of a roadway's through movement at any given intersection and for the roadway as a whole. Despite this, for generalized analyses, g/C is often ignored, because:

- g/C ratio typically varies from intersection to intersection along an arterial
- g/C ratio typically varies by time of day

Ignoring g/C undermines any arterial LOS analysis at a generalized planning level. This Handbook includes guidance to provide default g/Cs for generalized planning arterial analyses.

A major simplifying assumption that is essential to the development of the Generalized Service Volume Tables is the selection of one g/C for all intersections on an arterial. The g/C ratio of 0.44 was used for arterial analysis for all area types. FDOT has determined that for generalized planning analyses, the weighted average g/C ratio yields the closest results to actual conditions. **The weighted g/C ratio of an arterial is the average of the critical intersection through movement g/C ratio and the average of all the other intersections through movement g/C ratios for urban streets.** For example, if there are four signals with a through g/C ratio of 0.50 and one signal with a through g/C ratio of 0.40, then the weighted average g/C ratio for urban street is 0.45 (Refer to HCM for additional information). Essentially, the worst intersection is given equal weight to all the other intersections combined.

As an example, for the through movement phase, G is the green displayed time, Y the yellow displayed time (typically 3 or 4 seconds), R the all-red indication (typically 1 or 2 seconds), and C the cycle length. The most representative situation in Florida is for cycles to consist of four phases and 12 indications: one phase each to accommodate the main road through movement, the side road left movement, the side road through movement, and the main road left movement, with G, Y, and R indications for each of the four phases. The effective green time, which includes the effects of vehicular startup and clearance lost times is g.

FDOT's preferred approach for g/C determination for current year analyses is to use the actual signal timing plan from the traffic operations agency for the p.m. peak hour (typically 5–6 p.m.) for each signalized intersection. This is a consistent and cost-effective approach that provides reasonable accuracy. If the signal is actuated, $(G + 4)/C$ should be used for the through movement. This assumes the typical $Y + R$ time of 4 seconds as additional time allocated to the through movement as a result of unused time from the other movements. If the signal is pretimed, the g/C for the through movement should be used.

For consistency and ease of review, FDOT recommends using signal timing plans from the applicable traffic operations agency.

Analysts should be aware that signal timing plans come in a variety of forms, use many notations, and are not designed to directly address the determination of g/C. It may be necessary to coordinate with the operating agency directly to interpret the output values.

Analysts should calculate and input g/C for the through movement at all intersections. The g/C for left turning movements need only be collected at major intersections. A 10 percent value can be assumed as the left g/C for other intersections.

In previous FDOT guidance, FDOT offered two other methods for determining g/C:

- actual signal timings from the traffic operations agency
- field studies

Both approaches have some merit; however, after FDOT analyzed and tested both approaches, the preferred approach of using signal timing plans in general offers the best combination of consistency, accuracy, and cost-effectiveness. The use of field studies for g/C is discouraged, unless an early agreement by the affected parties is reached. The maximum acceptable facility through movement g/C ratios during the peak hour typically should not exceed:

- State principal arterials
 - Current year: 0.50
 - Long term (≥ 10 years out): 0.47
- Other roadways: 0.44

Under most circumstances, arterial facilities are 1.5–5.0 miles in length and include principal arterials as terminus points. The g/C value of 0.50 approximates FDOT's maximum allowable arterial capacity volumes of 1,000 vehicles per hour per lane (vphpl) and 950 vphpl in large urbanized areas and other urbanized areas, respectively.

7 Multimodal Variables

This chapter provides an overview of each multimodal variable used within Generalized Service Volume Tables to allow the user to recognize these variations and analyze multimodal LOS on specific roadways. Where applicable, generally acceptable ranges are provided. Multimodal variables describe the various geometric and demand characteristics that are needed to determine pedestrian, bicycle, and bus LOS. As with the control variables, multimodal variables are only applicable for arterial analyses:

- Paved shoulder/bicycle lane
- Outside lane width
- Pavement condition
- Sidewalk
- Sidewalk/roadway separation
- Sidewalk protective barrier
- Bus frequency
- Bus stop amenities
- Bus stop type
- Passenger loads

Table 7-1 provides an overview of the multimodal variable input requirements within the Generalized Service Volume Tables.

Table 7-1: Multimodal Variable Input Requirements

Input Variable	Generalized Service Volume Tables
Paved Shoulder/Bicycle Lane	R
Outside Lane Width	D
Pavement Condition	D
Sidewalk	R
Sidewalk/Roadway Separation	D
Sidewalk/Roadway Protective Barrier	D
Bus Frequency	R
Bus Stop Amenities	D
Bus Stop Type	D
Passenger Loads	D

Legend: R Required table input
D Default cannot be altered

The effects that individual variables have on the computational process vary. **Table 7-2** indicates the sensitivity of the multimodal variables on the capacity and LOS.

Table 7-2: Sensitivity of Multimodal Variables on Service Volumes

Control Variable	Sensitivity on Service Volumes
Paved Shoulder/Bicycle Lane	high
Outside Lane Width	low
Pavement Condition	low
Sidewalk	high
Sidewalk/Roadway Separation	medium
Sidewalk/Roadway Protective Barrier	medium
Bus Frequency	high
Bus Stop Amenities	low
Bus Stop Type	low
Passenger Loads	low

7.1. Paved Shoulder/Bicycle Lane

Within this Q/LOS Handbook, a bicycle lane is a designated or undesignated (paved shoulder) portion of a roadway for bicycles adjacent to vehicle lanes. Painted lines separate paved shoulders/bicycle lanes from vehicle lanes.

For planning purposes, a designated bicycle lane is usually 4 to 5 feet in width and has a bicycle logo. An undesignated bicycle lane is usually 4 feet in width and does not have a bicycle logo. To be considered a paved shoulder/bicycle lane, at least 3 feet of paved shoulder must exist outside the painted line. Facilities with striped shoulders between 1 and 3 feet should be considered as having wide outside lane widths.

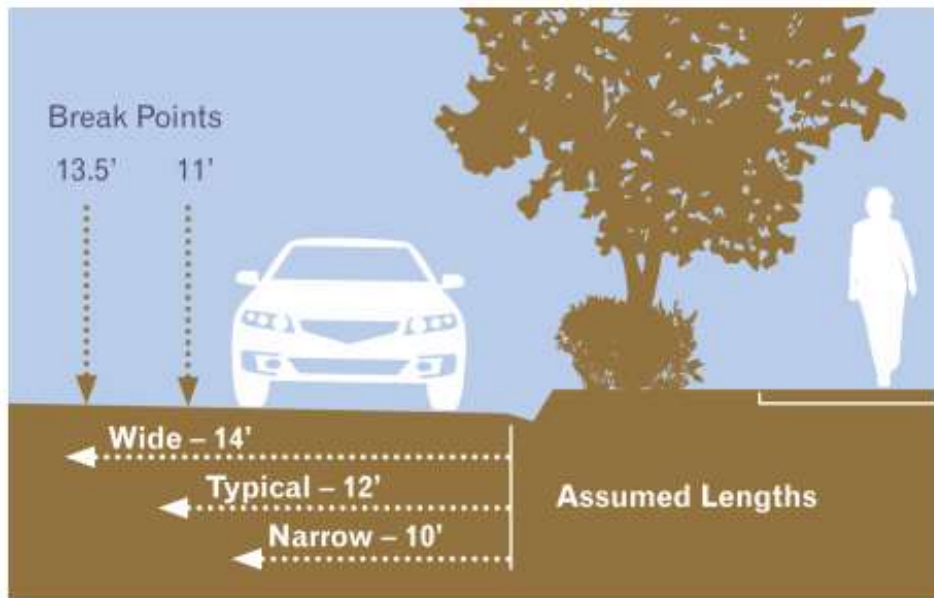
7.2. Outside Lane Width

Within this Q/LOS Handbook, **the outside lane width is the width, in feet, of a roadway's outside vehicle through lane, not including the gutter.** This factor is usually important in the determination of a roadway's BLOS. The majority of the SHS lane widths are 12 feet. Many local roads and some state highways have 14-foot outside lanes; these are sometimes referred to as wide curb lanes. Many other local roads and some state facilities have outside lane widths less than 12 feet.

These dimensions as shown in **Figure 7-1**, are for planning analyses only:

- Wide: greater than or equal to 13.5 feet.
- Typical: greater than or equal to 11 feet and less than 13.5 feet.
- Narrow: less than 11 feet.

Figure 7-1: Outside Lane Width



7.3. Pavement Condition

Pavement condition for BLOS analysis is a general classification of the roadway surface where bicycling usually occurs, not necessarily that drivers of vehicles experience. Three general classifications are used: desirable, typical, and undesirable. These general classifications are used in lieu of detailed pavement surface grades found in the operational model on which this planning technique is based.

- Desirable pavement condition is new or recently resurfaced pavement. The pavement still maintains a dark black color, is free of cracks, and rides smoothly.
- Typical pavement condition is the most common type of pavement condition of Florida's roadways and is used in the Generalized Service Volume Tables. Generally, the pavement has a light gray color, the surface appears worn, and may have some cracks; however, the ride for the bicyclist is smooth.
- Undesirable pavement condition consists of pavement with noticeable cracks, broken pavement, or ruts. There may be existing or partially filled potholes, or drainage grates hazardous to bicycles. When the bicycle riding surface contains loose dirt, gravel, or debris, even if the roadway surface is typical or desirable, then it would be considered undesirable.

In general, FDOT recommends the use of a typical pavement condition for most analyses, especially those involving future years.

For analysts familiar with FHWA's PAVECON factors, "desirable" would equate to a 4.5 or 5.0 rating, "typical" would equate to a 3.0 to 4.0 rating, and "undesirable" would equate to 2.5 or less.

7.4. Sidewalk

Within this Q/LOS Handbook, a sidewalk is a paved walkway for pedestrians at the side of a roadway, typically 5 feet in width. Paved roadway shoulders are not considered sidewalks. Because LOS analyses are directional, the existence of a sidewalk is based on the directional side of the arterial being analyzed.

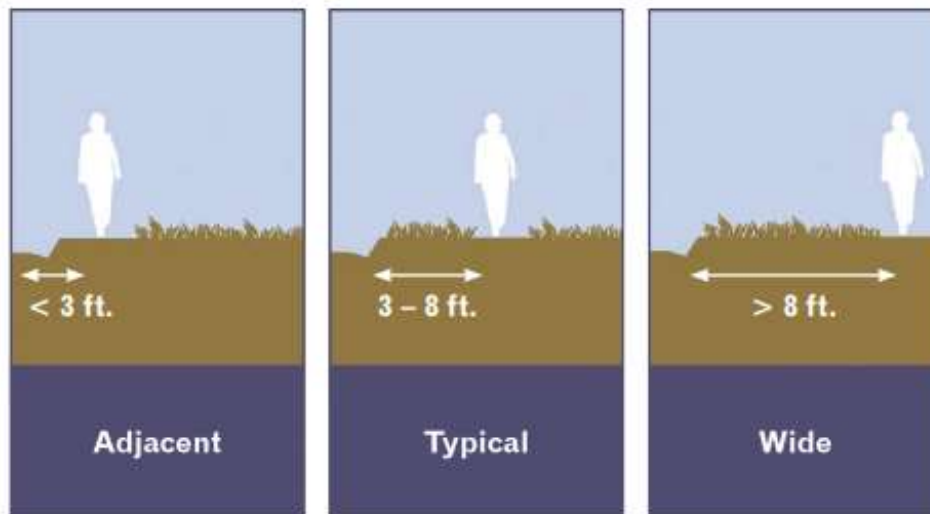
SIDEWALK/ROADWAY SEPARATION

Sidewalk/roadway separation is the lateral distance in feet from the outside edge of pavement to the inside edge of the sidewalk. Within this Q/LOS Handbook, sidewalk/roadway separation is classified in three ways, as shown in **Figure 7-2**:

- Adjacent: less than or equal to 3.0 feet
- Typical: greater than 3.0 feet and less than or equal to 8.0 feet
- Wide: greater than 8.0 feet

In general, pedestrians tend to walk toward the outer half of sidewalks, away from traffic.

Figure 7-2: Sidewalk/Roadway Separation



In downtown environments, sidewalks frequently extend at least 10-12 feet from the curb. When there are no tree plantings or other sidewalk/roadway protective barriers, sidewalks should be classified as adjacent. When there are tree plantings or some other barrier between where people walk and the outside edge of the travel lane, sidewalks are assumed to have typical separation.

When on-street parking and sidewalks both exist, the sidewalk/roadway separation should be considered wide, regardless of how close the sidewalk is to the edge of the pavement. Essentially, on-street parking adds approximately 8 additional feet between pedestrians and vehicles.

7.5. Sidewalk Protective Barrier

In addition to sidewalk width, this Q/LOS Handbook adds an overall sidewalk protective barrier factor to include the added benefits of trees, on-street parking, or other barriers.

7.6. Bus Frequency

Bus frequency, also known as headway, refers to the number of scheduled, fixed-route buses that have a potential to stop on a given roadway segment in one direction of flow in a one-hour time period. Express buses with no potential of stopping along a roadway are not included.

7.7. Bus Stop Amenities

The bus stop is often the first component of any transit system a passenger will encounter, and available amenities for comfort or safety can greatly influence the perceived QOS along a route. Rather than quantify all potential bus stop components, this Q/LOS Handbook creates four categories of bus stop amenities: excellent, good, fair, and poor. Having shelter from the weather and a place to sit is the most desirable condition at any bus stop, regardless of type, and is considered an excellent condition. A shelter without a bench represents a good condition, because rain, wind, and sun could otherwise deter choice riders. A stop with only a bench is less desirable than a stop with only a shelter and is considered a fair condition. A stop with no bench and no shelter is considered a poor condition. Because excellent bus stops may improve a user's perception of the system, the bus stop amenity factor is used to increase the adjusted bus frequency value. Bus stops with no amenities are uninviting and discourage use, and the variable is, therefore, used to decrease the adjusted bus frequency value, as shown in [Table 7-3](#).

Table 7-3: Bus Stop Amenity Factors

Bus Stop Amenities	Adjustment Factor
Excellent	1.1
Good	1.0
Fair	1.0
Poor	0.9

7.8. Bus Stop Type

Bus travel speed depends not only on distances and congestion along the route, but also the number of stops and the dwell time at each stop. Typical bus stops delay a bus for around 15 seconds, while major stations with numerous boardings and alightings can add around 35 seconds of delay.

7.9. Passenger Loads

Just as traffic congestion contributes to the degradation of the LOS, crowding on buses can affect the QOS. Because overcrowded buses may reduce the overall desirability of a route, a passenger load factor is used to modify the adjusted bus frequency value, as shown in [Table 7-4](#).

Table 7-4: Passenger Load Factor

Passenger Load Factor	Adjustment Factor
< 30%	1.05
< 70%	1.00
≤ 100%	0.95
> 100%	0.85

8 Future Year Analyses

Traffic and development conditions change on roadways over time. This raises questions about what input values, analysis tools, and LOS targets should be used for capacity and LOS analyses in future years. Analysis years and planning horizons vary appreciably in transportation planning. To help with understanding and for simplification in this text, **“long term” means 10 or more years from the current year, and “short term” means less than 10 years from the current year.** However, for a specific application, FDOT district LOS coordinators should be consulted for more detailed guidance.

For future year analyses, it is important to consider changes in the appropriate roadway, traffic volumes, land use, signal control, and multimodal characteristics. For example, under existing conditions in a transitioning area, signalization may be very infrequent; however, as development occurs, more signalized intersections can be anticipated and should be accounted for in future year capacity and LOS analyses. The traffic and control variables relevant to this handbook are discussed in the following sections. Refer to the FDOT PTF Handbook and the Traffic Analysis Handbook for further guidance on future year traffic development and analyses.

8.1. Change in Traffic Variables

8.1.1. AADT

Historical growth trends and the state’s travel demand forecasting models are typically used for long-term traffic projections. Analysts and reviewers of capacity and LOS analyses need to agree on what future AADT values to use. Additional information can be found in the PTF Handbook.

For site impact analyses, volumes are frequently presented in terms of trips generated by the site rather than roadway-specific AADT, K, and D values. Institute of Transportation Engineer’s (ITE’s) Trip Generation Handbook is typically used for trip generation for site impact analyses; however, FDOT should be consulted about supplemental material. In all cases, care should be given to ensure final values are compatible with statewide Standard K and D factors.

8.1.2. Planning Analysis Hour Factor (K)

As areas become more developed, measured K values often drop, primarily for two reasons. The first is that more urban situations typically are not subject to highly volatile volumes, such as holiday traffic in rural areas. Generally, more developed areas are subject to frequent recurring volumes, such as weekday commuter traffic. The second is that as congestion develops, the spreading of the peak travel hour traffic also occurs. Refer to FDOT PTF Handbook for Standard K values used by facility type.

For future year generalized planning analyses, the Standard K values for the assumed area and facility types on the backs of FDOT’s Generalized Service Volume Tables are appropriate. In the longer term, it may be necessary to determine if the area is projected to transition into a different area type over the analysis period.

8.1.3. Directional Distribution Factor (D)

For future year generalized planning analyses performed in this handbook, the D factor value for all area

and facility types is 0.55. If a site-specific analysis is conducted in the short term, FDOT's preferred approach is to use the FDOT's 200th Highest Hour Traffic Count Report from the FTO Web Application. In the longer term, some lowering of the factor may be appropriate. The analyst should refer to the D factors and their acceptable range in FDOT PTF Handbook.

8.2. Change in Control Variables

Making traffic and roadway projections into the future is a well-accepted practice for generalized planning analysis. For reasonable generalized planning analysis of signalized roadways, control variables must be addressed in the short and long terms. **Typically, the two most important control variables are the through movement g/C and signal density.**

8.2.1 g/C

Determining current and future g/Cs for a roadway is complicated, and judgments must be made. In the short and long terms:

- For Class II arterials, using the existing g/Cs is appropriate
- For Class I arterials not subject to significant development pressure, using the existing g/Cs is appropriate
- For Class I arterials incurring significant new development pressure, it is appropriate to lower through movement g/Cs
- For new individual signals, through movement g/Cs will vary greatly; however, for planning purposes, none should be assumed to be higher than 0.55

Within the HCS, an acceptable method to estimate future g/C ratios is by conducting intersection capacity analyses. The HCS will determine the required g/C ratios to progress through traffic movements on the major street, while simultaneously minimizing the delay to the minor street approaches.

8.2.2 Signal Density

As areas grow in population, additional traffic signals are frequently installed. Usually, these new signals do not significantly affect the capacity of roadways, unless they are in a previously undeveloped area or are so closely spaced that queue spillback occurs. They can play a major role in the determination of the LOS if stops occur more frequently and average travel speeds drop.

In short- and long-term analyses, it is appropriate to consider the probability of new traffic signals, especially based on proposed new developments. In the absence of specific development plans or intersecting traffic volume cross-product signalization criteria, general guidance should be used in developed areas.

In the short term:

- For Class II arterials, using the existing signalized intersection locations is appropriate
- For Class I arterials not subject to significant development pressure, using the existing signalized intersection locations is appropriate
- For Class I arterials incurring significant new development pressure, one additional signalized intersection per mile may be assumed

In the long term:

- For Class II arterials, one additional signalized intersection per mile may be assumed
- For Class I in small towns, one additional signalized intersection per mile may be assumed

Because of the wide variety of circumstances along generally uninterrupted flow highways in rural areas, no specific guidance can be given on future signal locations. However, for capacity and LOS purposes, the possibility of new signalized intersections should be considered. Because of the importance of signal density on the LOS on state roadways, for site impact applications, the number of new signals should be reviewed and approved by the FDOT district prior to use in an analysis.

Typically, other roadway, traffic, control, and multimodal variables do not have as large of an effect on the capacity and LOS as the ones addressed above. If some of these other inputs (e.g., turning movement percentages) were determined in a current year analysis, they can usually be applied to future year analysis. If these other variables were not determined for a current year analysis, the statewide default values on the backs of the Generalized Service Volume Tables may be assumed.

9 Maximum Capacity Volumes

The use of highway capacity and LOS analysis, whether applied appropriately or not, has resulted in projected traffic volumes beyond normal capacity ranges found on Florida facilities. There are multiple reasons for this, but to aid analysts and reviewers on what capacity values will normally be acceptable, FDOT has adopted a set of general guidelines. The values provided below are based on site-specific freeway studies and counts, as well as arterial maximum acceptable g/C ratios.

9.1. Arterials

For arterials, the maximum generally acceptable per-lane approach volumes are:

- Large urbanized: 1,000 vehicles per hour per lane (vphpl)
- Other urbanized: 950 vphpl
- Transitioning: 920 vphpl
- Urban: 920 vphpl
- Rural: 850 vphpl

The Maximum volumes may vary due to widely varying g/C, turning movements at intersections, and the segmentation of roadways. The maximum volumes represent a weighted g/C of approximately 0.50, which is the average of the critical g/C and the average of all other g/Cs along an urban street facility. Typically, there will be at least one principal arterial intersecting an urban street being analyzed. Such intersections are usually the critical intersections (hot spots) for an arterial analysis, and g/C ratios for the through movements are in the range of about 0.40. Although these intersections are frequently flared out to achieve greater capacity, the through movement g/C ratios cannot increase appreciably if all intersection movements are included. Therefore, the use of a 0.50 g/C ratio for determining the capacity of an urban street should represent the upper bounds of what can be reasonably expected.

Arterial facility analyses typically involve intersecting principal arterials, but section analyses may not have intersecting principal arterials. Under these circumstances, urban street through movements during peak travel hours may feature g/C ratios in the 0.50 to 0.60 range. Such values may be appropriate for segment or section analyses; however, the use of such high g/C ratios is not normally acceptable for a facility analysis and may represent an inappropriate segmentation of roadways.

Another situation in which g/C ratios may be above 0.50 is in the outlying parts of urbanized areas or in transitioning areas for both arterials and generally uninterrupted flow highways. In these areas, signals have typically been recently installed, and side traffic has not yet reached the high levels that it will in future years. Therefore, although current maximum volumes per lane may be higher than those shown above, in the future, such values will likely not be sustained and should be avoided in the arterial analysis.

9.2. Freeways

For freeway facilities and sections, the maximum volumes at 70 mph free flow speed are 2,400 pcphpl as per HCM.

Freeway operational measures such as ramp metering may result in higher volumes.

In general, the implementation of ramp metering could have a 5 percent or less improvement on capacity.

9.3. Highways

For highway segments (generally uninterrupted flow highways), the maximum per-lane approach volumes as per HCM are:

- Two-lane
 - Developed: 1,700 pcphpl
 - Undeveloped: 1,700 pcphpl
- Multilane
 - Developed (55 mph free flow speed): 2,100 pcphpl
 - Undeveloped (60 mph free flow speed): 2,200 pcphpl

10 Florida's LOS Policy

REQUIREMENTS FOR LOS TARGETS FOR THE STATE HIGHWAY SYSTEM

It is FDOT's intent to plan, design, and operate the SHS at an acceptable LOS for the traveling public. The LOS targets are consistent with FDOT's Policy on Level of Service Targets for the SHS, [Topic No. 000-525-006](#). The policy outlines the automobile mode LOS target for urbanized areas and outside urbanized areas. The automobile mode LOS targets for the SHS during peak travel hours are D in urbanized areas and C outside urbanized areas. FDOT shall work with local governments to establish appropriate LOS targets for multimodal mobility and system design. The targets shall be responsive to all users, for context, roadway function, network design, and user safety.

11 Generalized Planning Analysis

11.1. Introduction

FDOT's Generalized Service Volume Tables found at the end of this Q/LOS Handbook are the primary analysis tool in conducting this type of planning analysis. **Although considered a good generalized planning tool, the Generalized Service Volume Tables are not detailed enough for project development and environment (PD&E) traffic analysis, final design, or operational analysis work, and should not be used for those purposes.** In addition, the Generalized Service Volume Tables cannot be relied upon when approaching LOS E and LOS F thresholds, because of operational fluctuations at the thresholds. More detailed analysis should be performed in these situations.

Specific applications of the Generalized Service Volume Tables include:

- Generalized comprehensive plan amendment analyses
- Statewide highway system deficiencies and needs
- Statewide mobility performance measure reporting
- Areawide baseline capacity (e.g., MPO boundaries) and service volume values for travel demand forecasting models
- Areawide influence areas (e.g., impact areas) for major developments
- Future year analyses (e.g., SIS Needs Plans, MPO LRTPs which have a 10 to 25-year planning horizon)
- Baseline capacity and service volumes for concurrency management systems

Generalized Service Volume Tables must be appropriately applied using the right area type and facility type designations and interpreted selecting the right values from the tables. The adjustment factors must be applied, as applicable.

It is quite possible that no single roadway has the exact values for all the roadway, traffic volumes, land use, signal control, and multimodal variables used in the Generalized Service Volume Tables. The tables must be applied with care to roadway facilities and in the determination of the LOS grade.

The automobile, bicycle, and pedestrian parts of the Generalized Service Volume Tables were developed based on the definitions and methodology of the HCM. Nationally the TCQSM is the comparable document to the HCM for bus analyses.

FDOT's Generalized Service Volume Tables consist of five area types grouped into three tables:

- Urbanized areas
- Areas transitioning into urbanized/urban areas, or cities with population of more than 5,000 not in urbanized areas
- Rural undeveloped areas, or cities and developed areas with population of less than 5,000

Most planning applications begin with AADT volumes given as an input, or end with AADT as a calculated output. Therefore, the generalized daily service volumes shown in Tables 1 through 3 depict the AADT based on a standard peak hour. Some local and regional entities have adopted two-direction peak hour standards.

Tables 4 through 6 provide generalized peak hour two-way service volumes. Generalized peak hour directional volumes (Tables 7 through 9) are provided, because traffic engineering analyses are conducted on an hourly directional basis. These hourly directional tables may be viewed as the most fundamental of the tables, because the two-way tables are simply the peak hour directional values divided by D, and the daily tables are simply the peak hour directional values divided by the D and K factors.

All three sets of tables are internally consistent. All of the volumes within the tables are based on the Standard K factors. The urban/transitioning freeways are based on the average of urbanized and rural Standard K factors. The PHFs of 0.95, 0.92, and 0.88 were used in the creation of the urbanized, transitioning/urban, and rural tables, respectively. The 200th highest hour for the directional distribution variable is approximately equivalent to the typical peak hour of a day during a peak season in a developed area. Again, it is stressed that the daily, peak hour two-way, and peak hour directional tables are internally consistent and based on the same time period and directional flow of traffic.

The input values used to generate the Generalized Service Volume Tables can be found on the backs of Tables 1 through 9 and yield the results on the fronts of the Tables.

The Generalized Service Volume Tables present maximum service volumes, or the highest numbers of vehicles, for a given LOS. Any number greater than the value shown for a roadway with a given number of lanes would drop the LOS to the next letter grade.

The Generalized Service Volume Tables should not be referred to as capacity tables. In general, the values shown are the maximum service volumes for a given LOS based on roadway, traffic, control, and multimodal conditions during the peak hour in the peak travel direction. Whereas the maximum service volume deals with the highest number of vehicles for a given LOS, capacity deals with the maximum number of vehicles or persons that can pass a point during a specified time period under prevailing roadway, traffic, and control conditions. Many of the LOS E service volumes in the hourly directional tables also represent the capacity of the roadway, but in general, most of the values do not reflect a roadway's capacity.

A clear case of not representing capacity values is the daily tables. Roadway capacities for the day far exceed the volumes shown in the daily tables. All roadways are underutilized in the early morning hours and many heavily congested roads will have volumes higher than the highest volumes shown in the daily tables, because traffic is backed up for more than a one-hour time period.

Another case of not representing capacity is the arterial LOS E service volumes. **The primary criterion for the LOS on arterials is the average travel speed, not the capacity of the roadway.** The average travel speed along arterials is made of many control variables (e.g., progression, cycle length), not just the capacity (i.e., v/c ratios) of signalized intersections. Only in the special case of when the capacity of signalized intersections controls how many vehicles can pass through the intersections does capacity essentially dictate the lowest acceptable average travel speeds along arterials.

FDOT's Generalized Service Volume Tables are:

- Annual Average Daily Service Volume Tables
 - Table 1: urbanized areas
 - Table 2: transitioning into urbanized areas or urban areas

- Table 3: rural undeveloped or rural developed areas
- Peak hour two-way service volume
 - Table 4: urbanized areas
 - Table 5: transitioning into urbanized areas or urban areas
 - Table 6: rural undeveloped or rural developed areas
- Peak hour directional service volume tables
 - Table 7: urbanized areas
 - Table 8: transitioning into urbanized areas or urban areas
 - Table 9: rural undeveloped or rural developed areas

11.2. Special Cases

The volumes in the Generalized Service Volume Tables should be considered as average volumes over the facility under analysis.

For example: If a 4-mile facility has AADT counts of:

- Segment 1 - 23,000
- Segment 2 - 22,000
- Segment 3 - 25,000
- Segment 4 - 23,000 and
- Segment 5 - 27,000

FDOT recommends the use of the average value 24,000 for comparison to the tables to determine the LOS.

The use of the average volume works reasonably well, unless there is one segment that has a widely disparate value, in which case a median value may be more appropriate.

11.2.1. Mid-Block Considerations

In general, Q/LOS analyses for interrupted flow facilities primarily focus on signalized intersections. The majority of motorist aggravation is generally attributable to delay, which primarily occurs at signalized intersections on arterials. Therefore, when using the Generalized Service Volume Tables, the number of lanes for arterials and other interrupted flow facilities should be determined at major intersections rather than mid-block.

Travelers place a greater emphasis on mid-block considerations while traveling on uninterrupted flow facilities and non-automobile modes. **For example, on two-lane highways in rural undeveloped areas, the LOS is largely determined by the ability to pass other vehicles.** For freeways, most travelers are concerned about the operation of the whole facility and not the operation of particular interchanges. For bicycle and pedestrian movements, the BLOS and PLOS models are calibrated for mid-block conditions. For bus LOS, the emphasis is on the ability to travel by bus over the length of facility, with less importance placed on individual intersections. Therefore, in general, the number of lanes for these situations reflect mid-block considerations.

11.2.2. Non-State Signalized Roadways Adjustment

The primary purpose of this Q/LOS Handbook is to compute the LOS for state facilities. However, the Generalized Service Volume Tables are structured and are reasonably well-suited to local governments that desire to use them to evaluate roads under local jurisdiction. A feature of the urbanized and transitioning/urban Generalized Service Volume Tables is that Non-State roadways are addressed. The only types of roadways not addressed in the tables are unsignalized local streets and unpaved roads.

The mere fact that roadways are operated and maintained by different governmental entities has no effect on the capacity or LOS of the roadways. **However, in general, Non-State roadways have lower capacities and service volumes than state facilities, because they have lower green times at signalized intersections.** The Generalized Service Volume Tables contain a 10 percent adjustment factor for Non-State roadways.

The HCM LOS criteria address arterials rather than collectors or local streets. FDOT considers it appropriate for local governments to decide how to analyze collectors.

Uninterrupted flow facilities are analyzed the same, regardless of whether they are state facilities or not.

11.2.3. Variations in Levels of Service

Higher Q/LOS for the automobile, bicycle, and pedestrian modes may not be achieved, even with extremely low traffic volumes, given the default values used in the Generalized Service Volume Tables. In the case of automobiles, the higher Q/LOS cannot be achieved primarily because the control characteristics simply will not allow vehicles to attain relatively high average travel speeds. In the case of bicycles and pedestrians, it is primarily caused by the lack of facilities serving those modes. The tables have adequate footnotes to reflect this unachievable concept.

Lower Q/LOS for the automobile, bicycle, and pedestrian modes may not be applicable, even with extremely high traffic volumes, given the default values used in the Generalized Service Volume Tables. In the case of automobiles, the lower Q/LOS are not applicable, primarily because the control characteristics do not allow enough vehicles to pass through an intersection in an hour. If vehicles could get through the intersection, they could obtain the applicable LOS speed threshold, but there is not enough capacity at the intersection to let them pass through.

In the case of bicycles and pedestrians, it is primarily caused by the existence of facilities adequately serving those modes. For example, if a sidewalk exists, it is very difficult to establish a set of conditions in which the LOS to the pedestrian is F.

Essentially, once the maximum service volume is reached, the next LOS grade is F. For example, in Service Volume Table 1 for multilane Class I arterials, if demand volumes are greater than the LOS D threshold, then the LOS is F, and if the volume is at the LOS D threshold, the LOS is D; essentially, LOS E does not exist.

11.2.4. Median and Turn Lane Adjustment (Divided/Undivided Roadways)

For simplicity, the Generalized Service Volume Tables have factors to adjust for the effects of mid-block medians and exclusive turn lanes at intersections. The cumulative effects of medians and exclusive turn lanes from common

occurrences are shown in the Generalized Service Volume Tables.

A median has the effect of changing the adjusted saturation flow rate or service volume by 5 percent. In Florida, most two-lane roadways do not have a median (e.g., a two-way left turn lane), so the tables assume no median for those facilities. However, if there is a median, appropriate service volumes should be increased 5 percent. Most multilane arterials and highways in Florida have medians, so the tables are set up to assume medians for those facilities. However, if there is no median, appropriate service volumes should be decreased 5 percent.

Most major roadways in Florida have exclusive left-turn lanes at intersections, except those with very low volumes. **If a roadway does not have left-turn lanes at major intersections, its service volume drops 20 to 25 percent, depending on the number of lanes, as indicated in the table.** The common design practice in Florida is to use shared through/right-turn lanes to accommodate right-turning vehicles. However, exclusive right-turn lanes have large capacity and service volume impacts for vehicles at major intersections.

11.2.5. One-Way Facility Adjustments

For simplicity, the urbanized and transitioning/urban area Generalized Service Volume Tables have an intuitive factor for the effects of one-way streets on vehicles. **Essentially, one-way pairs are assumed to have a 20 percent higher service volumes than corresponding two-way roadways with the same number of lanes.**

However, the Generalized Service Volume Tables treat each facility of a one-way pair separately. To account for that, the volumes in the daily and hourly two-way Tables 1 through 6 should be multiplied by 0.6, while the volumes in the hourly directional Tables 7 through 9 should be multiplied by 1.2, to obtain the correct volume and LOS.

For example, the AADT LOS D threshold for a 2-lane Class I arterial one-way facility in a transitioning area would be 9,720. This example is calculated using the Generalized Service Volume Table 2. The AADT LOS D threshold for a 2-lane Class I arterial in a transitioning area is 16,200. To calculate the LOS D threshold for a one-way facility, multiply 16,200 by the one-way facility adjustment, 0.6, to calculate the one-way facility LOS D threshold of 9,720.

11.2.6. Auxiliary Lane Adjustment

Freeway auxiliary lanes (lanes connecting on- and off-ramps) usually have significant capacity and LOS benefits. The values contained in the tables indicate their importance in a general way. To apply the values, simply add the volume shown in the freeway adjustment to the maximum service volume shown in the table.

11.2.7. Ramp Metering Adjustment

Freeway ramp metering has the benefit of smoothing out traffic demand entering a freeway during peak travel times. This benefit is reflected by increasing the service volumes shown on the tables by 5 percent.

11.2.8. Bicycle LOS (BLOS)

The bicycle portions of the Generalized Service Volume Tables make primary use of the two most important factors in determining the LOS for bicyclists: the existence of paved shoulders/bicycle lanes and vehicle volumes. **It is important to note that the volumes shown in the tables are not the number of bicyclists; rather, they are the number of vehicles in the outside lane.** Unlike automobile LOS, which is highly dependent on the number

of other vehicles on the roadway, **BLOS is not determined by how many other bicyclists are on road; rather, it is primarily determined by the bicycle accommodations on the roadway and volume of vehicles.**

The other factor used in the Generalized Service Volume Tables is the volume of vehicles in the outside lane. For analysis purposes, vehicle volumes are assumed to be equally spread across the number of directional roadway lanes. Unlike the automobile entries in the table, in which the number of lanes is an entry into the tables, a step of multiplying the volume by the number of lanes is needed to use the volume (hourly directional, hourly two-way, or daily) of vehicles. For example, in Table 7, the LOS C threshold for zero percent bicycle lane coverage is 150 vehicles for the outside lane. If the roadway has four lanes, then the 150 vehicles would be multiplied by 2 (number of directional lanes) to determine the maximum volume of vehicles for BLOS C in one direction of flow. The additional step was included to simplify the appearance of the tables and save space.

11.2.9. Pedestrian LOS (PLOS)

The pedestrian portions of the Generalized Service Volume Tables make primary use of the two most important factors in determining the LOS for pedestrians: the existence of a sidewalk and vehicle volumes. It is important to note that the volumes shown in the tables are not the number of pedestrians; rather, they are the number of vehicles in the outside lane. Unlike automobile LOS, which is highly dependent on the number of other vehicles on the roadway, PLOS is not determined by how many other pedestrians use the facility; rather, it is primarily determined by the presence of sidewalks and the volume of vehicles.

The other factor used in these tables is the volume of vehicles in the outside lane. For analysis purposes, vehicle volumes are assumed to be equally spread across the number of directional roadway lanes. Unlike the automobile entries in the table, in which the number of lanes is an entry into the tables, a step of multiplying the vehicle volume by the number of lanes is needed to use the volume (hourly directional, hourly nondirectional, or daily) of vehicles. For example, in Table 7, the LOS C threshold for 100 percent sidewalk coverage is 540 vehicles for the outside lane. If the roadway has four lanes, then the 540 vehicles would be multiplied by 2 (number of directional lanes) to determine the maximum volume of vehicles for PLOS C in one direction of flow. The additional step was included to simplify the appearance of the tables and save space.

All techniques in this Q/LOS Handbook are based on a directional analysis. For example, in the case of evaluating the automobile LOS on arterials, the LOS is for the peak directional flow, and the LOS for the off-peak direction could be higher, lower, or the same. This directional technique results in some unique perspectives when evaluating PLOS. Sidewalks, whether on one or both sides of a road, serve pedestrians in both directions, unlike facilities for the other modes. Furthermore, analysts should be especially careful when using the Generalized Service Volume Tables for determining PLOS when there is a sidewalk only on one side of the roadway. Because all the Generalized Service Volume Tables are based on peak hour directional analyses, PLOS based on the tables should be considered applicable only to the direction of the peak flow of traffic. When using the tables, there is typically a difference of two LOS grades if the sidewalk is, or is not, on the same side of roadway as the peak flow of traffic. Generally, having sidewalks on both sides of arterials in developed areas is considered desirable; yet, the Generalized Service Volume Tables do not adequately reflect that concept.

11.2.10. Bus LOS

The bus portions of the Generalized Service Volume Tables are primarily dependent on bus frequency,

which is the number of scheduled fixed-route buses that have a potential to stop in a given segment in the peak direction of flow in a one-hour time period. That measure is supplemented by pedestrian accessibility. In the Generalized Service Volume Tables, pedestrian accessibility is represented by two broad ranges of sidewalk coverage.

There are two unique aspects of bus mode entries of the Generalized Service Volume Tables. First, it is important to note that the volumes shown in the tables are the number of buses per hour. Unlike automobile, bicycle, and PLOS thresholds, the bus mode LOS thresholds are not related to the number of vehicles on the roadway. Second, regardless of the table used, all numbers are shown in terms of buses per hour for the peak hour in the peak direction. Thus, even in the daily urbanized table (Table 1), the threshold values shown are still in terms of peak hour directional buses.

11.3. Service Volume Calculation Process

All service volumes and resulting tables are first calculated for the peak hour in the peak direction. The peak hour two-way values are obtained by dividing the peak hour peak direction service volumes by D. The daily volumes are obtained by dividing the peak hour two-way service volumes by K.

Peak hour directional and peak hour two-way service volumes are rounded to the nearest 10 vehicles. Daily service volumes are rounded to the nearest 100 vehicles.

11.3.1. Arterial LOS

For the automobile mode, arterial analyses starts with a volume of 10 vph and then calculates the v/c ratio at each intersection. Then, the speed on each segment is calculated, which also accounts for the signal delay and the overall average speed for the facility. The average speed is checked against the average speed criterion for LOS A. If the speed is below the LOS A threshold, the volume is incremented by either 50 vph (if the difference in the actual speed and LOS threshold speed is large) or 10 vph (if the difference in actual speed and LOS threshold speed is small). This process is repeated until the average facility speed is approximately equal to the LOS A threshold. The volume level at which this occurs is the service volume for LOS A. The volume (i.e., LOS A service volume) is then incremented by 10 vph and incrementally increased until the average facility speed is approximately equal to the LOS B threshold speed. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation is stopped. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades.

For the bicycle and pedestrian modes, again the analyses is started with a volume of 10 vph and then BLOS and PLOS scores are calculated based on the BLOS and PLOS models. Then, that score is checked against the LOS A criterion. If the score is below the LOS A threshold value, the volume is incremented by 10 vph. This process is repeated until the facility score is approximately equal to the LOS A threshold. The volume level at which this occurs is then the service volume for LOS A. The volume (i.e., LOS A service volume) is then incremented by 10 vph and incrementally increased until the average facility score is approximately equal to the LOS B threshold volume. This process repeats for LOS C, D, and E. If at any point during this process the vehicle v/c ratio exceeds 1.0 for the full hour, the calculation is stopped. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time as well as for the lower Q/LOS grades.

For the bus mode, the LOS service frequency criteria that appear in the TCQSM is used, modified by PLOS, relative auto speed, bus stop amenities, and passenger load factors.

11.3.2. Freeway Facilities LOS

For freeways, the HCS7 freeway facilities module was used to obtain the service volume thresholds. The automobile volume is incrementally increased until the demand flow rate to the mean speed of the traffic stream produces an average facility density that is approximately equal to the LOS A threshold. The volume level at which this occurs is the service volume for LOS A. The volume (i.e., LOS A service volume) is then incrementally increased by 10 vph and until the average facility density is approximately equal to the LOS B threshold speed. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation stops. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades. The traffic factors and other inputs such as CAF and SAF used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables.

11.3.3. Highways LOS

For multilane uninterrupted flow highways, HCS7's multilane highways procedure starts with a volume of 10 vph and then calculates density. If the density is below the LOS A threshold density, the volume is incremented by 10 vph. This process is repeated until the average density is approximately equal to the LOS A threshold. The volume level at which this occurs is then the service volume for LOS A. The volume (i.e., LOS A service volume) is then increased by 10 vph until the average facility density is approximately equal to the LOS B threshold density. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation stops. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades. The traffic factors and other inputs such as CAF and SAF used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables. A different free flow speed is used in the analyses for multilane uninterrupted flow highways passing through undeveloped areas and developed areas.

For two-lane uninterrupted flow highways, the computational process is similar to the process followed for multilane uninterrupted flow highways. The HCS7's two-lane highways module is dependent on the highway class (I, II, or III). The traffic factors and other inputs used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables. A different free flow speed is used in the analyses for two-lane uninterrupted flow highways passing through undeveloped areas and developed areas.

Glossary

Acceleration lane	A freeway lane extending from the on-ramp gore to where its taper ends.
Accessibility	The dimension of mobility that addresses the ease in which travelers can engage in desired activities.
Actuated control	All approaches to the signalized intersection have vehicle detectors, with each phase subject to a minimum and maximum green time, and some phases may be skipped if no vehicle is detected. Same as <i>actuated</i> and <i>fully actuated control</i> .
Actuated-Coordinated control	The fixed-cycle signal control of an intersection in which the through movement on the designated main roadway gets the unused green time from side movements because of limited or no vehicle activation from side movements. Same as <i>coordinated-actuated</i> .
Add-on/drop-off lanes	The roadway lanes added before an intersection and dropped after the intersection. Same as <i>expanded intersections</i> .
Adjusted saturation flow rate	In this Q/LOS Handbook, the base saturation flow rate times the effect of many roadway variables and traffic variables.
Adjustment factor	In the Generalized Service Volume Tables: additive or multiplicative factors to adjust service volumes.
All-way stop control	An intersection with a stop sign at all approaches.
Annual average daily traffic	The volume passing a point or segment of a roadway in both directions for one year, divided by the number of days in the year.
Areawide analysis	An evaluation within a geographic boundary.
Arrival type	A general categorization of the quality of signal progression.
Arterial	A signalized roadway that primarily serves through traffic with average signalized intersection spacing of 2 miles or less; a type of roadway based on FDOT's functional classification.
Auxiliary lane	An additional lane on a freeway connecting an on-ramp of one interchange to the off-ramp of the downstream interchange.
Average daily traffic	The total traffic volume during a given time period (more than a day and less than a year) divided by the number of days in that time period.
Average travel speed	The facility length divided by the average travel time of all vehicles traversing the facility, including all stopped delay times.
Axle correction factors	The adjustment factors used to calculate the annual average daily traffic by compensating for an axle counter's tendency to count more vehicles than are present.
Base conditions	The best possible characteristic in terms of capacity for a given type of facility.

Base saturation flow rate	The maximum steady flow rate, expressed in passenger cars per hour per lane, at which passenger cars can cross a point on interrupted flow roadways.
Basic segment	In this Q/LOS Handbook, the length of a freeway in which operations are unaffected by interchanges. Same as <i>basic freeway segment</i> .
Basic two-lane highway Segments	A highway segment upstream of the intersection influence area and downstream of the affected downstream highway segment, and thus not affected by signalized intersections.
Bicycle lane	In this Q/LOS Handbook, a designated or undesignated portion of roadway for bicycles adjacent to vehicle lanes.
Bicycle level of service score	A numerical value calculated by the BLOS Model that corresponds to a BLOS.
Bus frequency	The number of buses per hour serving one direction of a roadway facility.
Bus stop	An area where bus passengers wait for, board, alight, and transfer.
Bus stop amenities	Enhancements for comfort or safety that can greatly influence the perceived QOS along a route. Four categories of bus stop amenities exist: excellent, good, fair, and poor.
Bus stop amenity factors	Factors used to determine the adjusted bus frequency value by applying a factor commensurate to the quality of bus stop amenities.
Bus stop type adjustment factors	Factors that adjust travel times along bus routes by adding 15 to 35 seconds of delay per route for typical and major bus stops, respectively.
Capacity	The maximum sustainable flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of roadway during a given time period under prevailing conditions. As typically used in this Q/LOS Handbook, the maximum number of vehicles that can pass a point in one hour under prevailing roadway, traffic and control conditions.
Capacity adjustment factor	An adjustment factor used in the HCS7 freeways and multilane highways module to adjust the capacity of a facility for reduced capacity situations or to match field measurements. The capacity can be reduced to represent incident situations, such as construction and maintenance activities, adverse weather, traffic incidents, and vehicle breakdowns.
Capacity constrained	A condition in which traffic <i>demand</i> exceeds the capacity of a roadway.
Capacity utilization	The dimension of mobility that addresses the quantity of operations relative to capacity.
Captive rider	A transit rider who is limited by circumstances to use transit as a primary source of transportation.
Choice rider	A transit rider who chooses to take transit over other readily available transportation options.
Class I arterial	A roadway that has posted speeds of 40 mph or higher.

Class II arterial	A roadway that has posted speeds of 35 mph or less.
Collector	A roadway providing land access and traffic circulation with residential, commercial and industrial areas.
Concurrency	A systematic process utilized by local governments to ensure new development does not occur unless adequate infrastructure is in place to support growth.
Context classification	A classification assigned to a roadway that broadly identifies the various built environments in Florida, based on existing or future land use characteristics, development patterns, and the roadway connectivity of an area.
Control delay	The component of delay that results when a signal causes traffic to reduce speed or stop.
Control variables	The parameters associated with roadway controls.
Core freeways	The major, non-toll freeways going through the urbanized core areas of the largest metropolitan areas, such as Interstate 4 in Orlando. FDOT has adopted lower K values for these freeways to represent a peak period, as opposed to a peak hour analysis. The lower K values affect daily service volumes only in the Generalized Service Volume Tables.
Critical signalized intersection	The signalized intersection with the lowest volume-to-capacity ratio (v/c), typically the one with the lowest effective green ratio (g/C) for the through movement. Same as <i>critical signalized intersection</i> .
Cycle length	The time it takes a traffic signal to go through one complete sequence of signal indications.
Deceleration lane	A freeway lane extending from the taper to the off-ramp gore.
Delay	The additional travel time experienced by a traveler.
Demand	The number of persons or vehicles desiring service on a roadway. Same as <i>demand traffic</i> .
Density	The number of vehicles, averaged over time, occupying a given length of lane or roadway; usually expressed as vehicles per mile or vehicles per mile per lane.
Developed areas	All areas not rural undeveloped. Same as rural developed areas.
Directional distribution factor	The proportion of an hour's total volume occurring in the higher volume direction.
Effective green ratio	Typically in this Q/LOS Handbook, the ratio of the effective green time (g) for the through movement at a signal intersection to its cycle length (C).
Effective green time	The time allocated for the through movement to proceed; calculated as the through movement green plus yellow plus all-red indication times less the lost time.
Exclusive left-turn storage length	The total amount of storage length, in feet, for exclusive left-turn lanes.
Exclusive right-turn lanes	A storage area designated to only accommodate right-turning vehicles.

Exclusive turn lane	A storage area designated to only accommodate left- or right-turning vehicles; in this Q/LOS Handbook, the turn lane must be long enough to accommodate enough turning vehicles to allow the free flow of the through movement.
Five-lane section	A roadway with four through lanes, two in each direction, separated by a two-way left turn lane; in the Generalized Service Volume Tables, a five-lane section is treated as a roadway with four lanes and a median.
Flow rate	In this Q/LOS Handbook, the equivalent hourly rate at which vehicles pass a point on a roadway for a 15-minute period.
Free flow speed	In this Q/LOS Handbook, the average speed of vehicles under low-flow traffic conditions and not under the influence of signals, stop signs, or other fixed causes of interruption, generally assumed to be 5 mph over the posted speed limit.
Freeway	A multilane, divided highway with at least two lanes for the exclusive use of traffic in each direction and full control of ingress and egress.
Freeway segment	In this Q/LOS Handbook, a basic segment, interchange or toll plaza.
FSUTMS	Florida Standard Urban Transportation Model Structure; Florida's software that forecasts travel demand.
Functional classification	The assignment of roads into systems according to the character of service they provide in relation to the total road network.
Generalized Service Volume Tables	Maximum service volumes based on areawide roadway, traffic, and control variables and presented in tabular form.
Generalized planning	A broad type of planning application that includes statewide analyses, initial problem identification, and future year analyses. In this Q/LOS Handbook, typically performed by using the Generalized Service Volume Tables.
Gore	The point located immediately between the left edge of a ramp pavement and the right edge of the roadway pavement at a merge or diverge area.
Headway	The time, in seconds, between two successive vehicles as they pass a point on a roadway.
Heavy vehicle	An FHWA vehicle classification of 4 or higher; essentially, vehicles with more than 4 wheels touching the pavement during normal operation.
Heavy vehicle factor	The adjustment factor for heavy vehicles.
Heavy vehicle percent	The percentage of heavy vehicles in the traffic stream.
Highway capacity analysis	An examination of the maximum of vehicles or persons that can reasonably be expected to pass a point on a roadway during a specified time period under prevailing roadway, traffic, and control conditions. Same as <i>capacity analysis</i> .
Highway Capacity Manual	The Transportation Research Board's document on highway capacity and QOS.
Highway Capacity Software 7	Software that replicates the HCM, Sixth Edition.

Interchange	In this Q/LOS Handbook, the influence area associated with the off-ramp influence area, overpass/underpass, and on-ramp influence area of a connection to a freeway. Same as <i>freeway interchange influence area</i> .
Interrupted flow	A category of roadways characterized by signals, stop signs, or other fixed causes of periodic delay or interruption to the traffic stream, with average spacing less than or equal to 2.0 miles.
Intersection influence area	In this Q/LOS Handbook, a segment of an uninterrupted flow highway influenced by an isolated intersection.
Interval	A period of time in which all traffic signal indications remain constant.
Isolated intersection	An intersection occurring along an uninterrupted flow highway.
Large urbanized area	A Metropolitan Planning Organization urbanized area greater than 1 million in population; in Florida, these seven areas consist of the following central cities: Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach.
Lateral clearance	Clearance distance from edges of outside lanes to fixed obstructions.
Level of service	A quantitative stratification of the QOS to a typical traveler of a service or facility into six letter-grade levels, with A describing the highest quality and F describing the lowest quality; a discrete stratification of a QOS continuum.
Level of service targets	The same as the statewide minimum LOS targets for the State Highway System.
Load factor	The ratio of passengers actually carried to the total passenger capacity of a bus.
Local adjustment factor	In the 2013 Q/LOS Handbook, an adjustment factor FDOT used to adjust base saturation flow rates or base capacities to better match actual Florida traffic volumes; mostly consisted of a driver population factor and an area type factor.
Maximum service volume	The highest number of vehicles for a given LOS.
Median	In this Q/LOS Handbook, areas at least 10 feet wide that are restrictive or non-restrictive, which separate opposing-direction mid-block traffic lanes and, on arterials, contain turn lanes that allow left-turning vehicles to exit from the through traffic lanes.
Median type	A classification of roadway medians as restrictive, non-restrictive, or no median.
Mid-block	In this Q/LOS Handbook, the part of a roadway between two signalized intersections.
Mobility	The movement of people and goods.
Mode	A method of travel; in this Q/LOS Handbook, either automobile, bus, bicycle, or pedestrian.
Motorized mode	A method of travel by automobile or bus.

MPO/TPO	Metropolitan/Transportation Planning Organization.
Multilane highway	A nonfreeway roadway with two or more lanes in each direction and, although occasional interruptions to flow at signalized intersections may exist, is generally uninterrupted flow.
Multimodal	In this Q/LOS Handbook, more than one mode.
Multimodal Transportation District	An area in which secondary priority is given to vehicle mobility, and primary priority is given to ensuring a safe, comfortable, and attractive pedestrian environment, with convenient interconnection to transit (F.S. 163.3180[15]).
No passing zone	In this Q/LOS Handbook, a segment of a two-lane highway along which passing is prohibited in the analysis direction.
Non-restrictive median	A painted, at-grade area separating opposing mid-block traffic lanes.
Non-State signalized roadway	A signalized roadway not on the State Highway System.
Number of effective lanes	In terms of capacity, the equivalent number of through lanes. Typically, the number is expressed as a fraction (e.g., 2.7) to reflect the partial beneficial effects of freeway auxiliary lanes or arterial add-on/drop-off lanes.
Number of through lanes	The number of lanes relevant to an analysis of a roadway's LOS. FOR ARTERIALS ■ Usually at the signalized intersection, not mid-block ■ Usually through and shared right-turn lanes ■ Maybe a fractional number reflecting add-on/drop-off lanes or other special lane utilization considerations ■ Using the Generalized Service Volume Tables, the number at major signalized intersections FOR FREEWAYS AND UNINTERRUPTED FLOW HIGHWAYS ■ Does not include auxiliary lanes between two points ■ Usually the predominant number of through lanes between two points
Off-ramp influence area	The geographic limits affecting the capacity of a freeway associated with traffic exiting a freeway. Same as <i>diverge area</i> .
On-ramp influence area	The geographic limits affecting the capacity of a freeway associated with traffic entering a freeway. Same as <i>merge area</i> .
One-way	A type of roadway in which vehicles are allowed to move in only one direction.
Operational analysis	A detailed analysis of a roadway's present or future LOS, as opposed to a generalized planning.
Other urbanized area	A Metropolitan Planning Organization urbanized area with less than 1 million in population.
Oversaturated	A traffic condition in which demand exceeds capacity.
Passenger load factors	Factors used to determine the adjusted bus frequency value by applying a factor commensurate to the level of passenger crowding.

Passing lane	A lane added to provide passing opportunities in one direction of travel on a two-lane highway. Two-way left-turn lanes are not considered passing lanes.
Paved shoulder/bicycle lane	In this Q/LOS Handbook, pavement at least 3 feet in width separated by a solid pavement marking from the outside vehicle through lane to the edge of the pavement.
Peak direction	The course of the higher flow of traffic.
Peak hour	In this Q/LOS Handbook, a one-hour time period with high volume.
Peak hour factor	The ratio of the hourly volume to the peak 15-minute flow rate for that hour; specifically, hourly volume/(4 x peak 15-minute volume).
Peak period	A multi-hour analysis period with high volume; peak periods rather than peak hours are typically used for the analysis of core freeways or roadways within a Multimodal Transportation District.
Peak season	The 13 consecutive weeks with the highest daily volumes for an area.
Peak season weekday average daily traffic	The average daily traffic for Monday through Friday during the peak season.
Pedestrian	An individual traveling on foot and other non-motorized modes such as skateboards, scooters and both motorized and non-motorized wheelchairs.
Pedestrian accessibility	In this Q/LOS Handbook, the ease in which a pedestrian can reach a bus stop.
Pedestrian LOS Model	The operational methodology from which this Q/LOS Handbook's pedestrian Q/LOS analyses are based.
Pedestrian level of service score	A numerical value calculated by the PLOS Model that corresponds to a PLOS.
Pedestrian/sidewalk/roadway separation	The lateral distance, in feet, from the outer edge of the pavement to where a pedestrian walks on a sidewalk.
Percent time spent following	The average percent of total travel time that vehicles must travel in platoons behind slower vehicles because of the inability to pass on a two-lane highway.
Performance measure	A qualitative or quantitative factor used to evaluate a particular aspect of travel quality.
Person flow	The capacity on uninterrupted and interrupted flow facilities, defined in terms of persons per hour.
Phase	The part of a traffic signal's cycle allocated to any combination of traffic movements receiving the right of way simultaneously during one or more intervals.
Planning analysis hour factor	The ratio of the traffic volume in the study hour to the annual average daily traffic.
Planning horizon	A time period, typically 20 years, applicable to the analysis of a project, roadway or service.
Platoon	A group of vehicles traveling together as a group, either voluntarily or

involuntarily because of signal control, geometrics, or other factors.

Point	A boundary between links. In this Q/LOS Handbook, usually a signalized intersection, but maybe other places where modal users enter, leave, or cross a facility, or roadway characteristics change.
Posted speed	The maximum speed at which vehicles are legally allowed to travel over a roadway segment.
Pretimed control	Traffic signal control in which the cycle length, phase plan, and phase times are preset and repeated continuously, according to a preset plan.
Prevailing conditions	Existing circumstances that primarily include roadway, traffic, and control conditions, but may also include weather, construction, incidents, lighting, and area type.
Principal arterial	A signalized roadway that primarily serves through traffic between centers of metropolitan areas and provides a high degree of mobility. In this Q/LOS Handbook, principal arterials have approximately one signal every half mile and a posted speed limit of 50 mph.
Quality of service	A traveler-based perception of how well a service or facility is operating.
Quality/level of service	A combination of the broad QOS and more detailed LOS concepts.
Queue spillback	When a link's queue of vehicles extends to upstream links.
Ramp overlap segment	The length for which the upstream on-ramp influence area and the downstream off-ramp influence area overlap.
Restrictive median	A raised or grassed area that restricts crossing movements.
Roadway	A general categorization of an open way for persons and vehicles to traverse; in this Q/LOS Handbook, it encompasses streets, arterials, freeways, highways, and other facilities.
Roadway class	The categories of two-lane highways; two-lane highways are primarily grouped by area type. Same as <i>class</i> .
Roadway variables	The parameters associated with roadways. Also known as <i>roadway characteristics</i> .
Rolling terrain	A combination of horizontal and vertical alignments causing heavy vehicles to reduce their running speeds substantially below that of passenger cars, but not to operate at crawl speeds for a significant amount of time.
Route	As used in the TCQSM, a designated, specified path to which a bus is assigned.
Route segment	As used in the TCQSM, a portion of a bus route ranging from two stops to the entire length of the route.
Running speed	The distance a vehicle travels divided by the travel time the vehicle is in motion.
Rural area	In the Generalized Service Volume Tables, areas that are not

	urbanized areas, transitioning areas, or urban areas.
Rural developed areas	The portions of rural areas that are along coastal roadways or in generally populated areas with a population of less than 5,000.
Rural undeveloped areas	Portions of rural areas with no or minimal population or development.
Scheduled fixed route	In this Q/LOS Handbook, bus service provided on a repetitive, fixed-schedule basis along a specific route, with buses stopping to pick up and deliver passengers to specific locations.
Seasonal adjustment factor	A factor used to adjust for the variation in traffic over the course of a year.
Section	A group of consecutive segments that have similar roadway characteristics, traffic characteristics and, as appropriate, control characteristics for a mode of travel. A characteristic describing laneage (e.g., three-lane section, five-lane section, seven-lane section).
Segment	A portion of a facility defined by two boundary points; usually the length of roadway from one signalized intersection to the next signalized intersection.
Service measure	A specific performance measure used to assign a LOS to a set of operating conditions for a transportation facility or service.
Service volume table	Maximum service volumes based on roadway, traffic and control variables and presented in tabular form.
Seven-lane section	A roadway with six through lanes, three in each direction separated by a two-way left-turn lane; in the Generalized Service Volume Tables, a seven-lane section is treated as a roadway with six lanes and a median.
Shared lane	A roadway lane shared by two or three traffic movements; in Florida, a shared lane usually serves through and right-turning traffic movements.
Sidewalk	A paved walkway for pedestrians at the side of a roadway.
Sidewalk/roadway protective barrier	Physical barriers separating pedestrians on sidewalks and vehicles.
Sidewalk/roadway separation	The lateral distance in feet from the outside edge of the pavement to the inside edge of the sidewalk.
Signal	In this Q/LOS Handbook, a traffic control device regulating the flow of traffic with green, yellow, and red indications. A traffic control device that routinely stops vehicles during the study period; excluded from this definition are flashing yellow lights, railroad crossings, draw bridges, yield signs, and other control devices.
Signal density	The number of signals intersections per mile.
Signal type	The kind of traffic signal (actuated, pretimed or coordinated-actuated) with respect to the way its cycle length, phase plan, and phase times are operated.

Signalized intersection	A place where two roadways cross and have a signal controlling traffic movements.
Signalized intersection spacing	The distance between signalized intersections.
Simple average	An average that gives equal weight to each component.
Speed	In this Q/LOS Handbook, the same as average travel speed, unless specifically noted.
Speed adjustment factor	An adjustment factor in HCS 7's freeways and multilane highways module, used to adjust the speed of a facility to account for the effects of adverse weather and construction work zones. The SAF also may be used to calibrate estimates of free-flow speed for local conditions or other effects that contribute to a reduction in free-flow speed.
Standard K	FDOT's standard peak hour to annual average daily traffic ratio (K), based on a roadway's characteristics (facility type) and location (area type). Values of less than 9 percent essentially represent a multi-hour peak period rather than a peak hour.
State Highway System	All roadways that FDOT operates and maintains; the State Highway System consists of the Florida Intrastate Highway System and other state roads.
Stochastic	A description of a type of model that incorporates variability and uncertainty into analysis.
Strategic Intermodal System	Florida's system of transportation facilities and services of statewide and interregional significance.
Termini	In this Q/LOS Handbook, the beginning and endpoints of a facility.
Three-lane section	A roadway with two through lanes separated by a two-way left-turn lane. In the Generalized Service Volume Tables, a three-lane section is treated as a roadway with two lanes and a median. An exclusive passing lane on a two-lane highway is not considered a three-lane section.
Threshold	The breakpoints between LOS differentiations.
Threshold delay	The additional travel time represented by the difference between the time associated with a roadway's generally accepted speed (LOS D threshold in urbanized areas and LOS C threshold in nonurbanized areas) and average travel speed. Same as LOS threshold delay.
Through movement	In this Q/LOS Handbook, the traffic stream with the greatest number of vehicles passing directly through a point. Typically, this is the straight-ahead movement, but occasionally it may be a turning movement.
Traffic demand	The number of vehicles with drivers who desire to traverse a particular highway during a specified time period.
Traffic volume	The number of vehicles passing a point on a highway during a specified time period.
Transit	In this Q/LOS Handbook, the same as <i>bus</i> .

Transit Capacity and Quality of Service Manual (TCQSM)	The document and operational methodology from which this Q/LOS Handbook's bus Q/LOS analyses are based.
Transitioning area	An area adjacent to an urbanized area that exhibits characteristics between rural and urbanized/urban, and will be urbanized in the next 20 years.
Transportation planning boundaries	Precisely defined lines that delineate geographic areas. These boundaries are used throughout transportation planning in Florida. Their mapping is described in Urban Boundaries and Functional Classification of Roadways FDOT's Procedure Topic No. 525-020-311 .
Travel time	The average time spent by vehicles traversing a roadway.
Two-lane highway	A roadway with one lane in each direction on which passing maneuvers must be made in the opposing lane and, although occasional interruptions to flow at signalized intersections may exist, is generally uninterrupted flow.
Two-way	Movement allowed in either direction.
Two-way left-turn lane	A lane that simultaneously serves left-turning vehicles traveling in opposite directions. Same as continuous left-turn lane.
Two-way stop control	The type of traffic control at an intersection where drivers on the minor street, or a driver turning left from the major street, wait for a gap in major-street traffic to complete a maneuver.
Undesignated bicycle lane	A lane, usually 4 feet in width, that does not contain a bicycle logo.
Undivided	As used in the Generalized Service Volume Tables, a roadway with no median.
Uninterrupted flow	A category of roadway not characterized by signals, stop signs, or other fixed causes of periodic delay or interruption to traffic stream.
Uninterrupted flow highway	A nonfreeway roadway that generally has uninterrupted flow, with average signalized intersection spacing of greater than 2.0 miles; a two-lane highway or a multilane highway.
Urban area	A place with a population between 5,000 and 50,000 and not in an urbanized area. The applicable boundary includes the census' urban area and the surrounding geographical area agreed on by the FDOT, the local government, and the FHWA. The boundaries are commonly called FHWA Urban Area Boundaries and include areas expected to develop medium density before the next decennial census.

Urbanized area	An area within a Metropolitan Planning Organization's (MPO) designated urbanized area boundary. The minimum population for an urbanized area is 50,000 people. Based on the census, any area the U.S. Bureau of Census designates as urbanized, together with any surrounding geographical area agreed on by the FDOT, the relevant MPO, and the FHWA, commonly called the FHWA Urbanized Area Boundary.
Volume-to-capacity ratio	The ratio of demand flow rate to capacity of a signalized intersection, segment or facility.
Weaving distance	A length of freeway over which traffic streams across paths through lane-changing maneuvers. Same as <i>weaving segment</i> .
Weighted effective green ratio	In this Q/LOS Handbook, the average of the critical intersection's through effective green ratio and the average of all the other signalized intersections' through effective green ratios along the arterial facility.

TABLE 1

Generalized **Annual Average Daily** Volumes for Florida's
Urbanized Areas

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Core Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	16,800	17,700	**	4	47,600	66,400	83,200	87,300	
4	Divided	*	37,900	39,800	**	6	70,100	97,800	123,600	131,200	
6	Divided	*	58,400	59,900	**	8	92,200	128,900	164,200	174,700	
8	Divided	*	78,800	80,100	**	10	115,300	158,900	203,600	218,600	
						12	136,500	192,400	246,200	272,900	
Class II (35 mph or slower posted speed limit)						Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	7,300	14,800	15,600	4	45,900	62,700	75,600	85,400	
4	Divided	*	14,500	32,400	33,800	6	68,900	93,900	113,600	128,100	
6	Divided	*	23,300	50,000	50,900	8	91,900	125,200	151,300	170,900	
8	Divided	*	32,000	67,300	68,100	10	115,000	156,800	189,300	213,600	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lanes Ramp					
Non-State Signalized Roadways - 10%						Present in Both Directions Metering					
						+ 20,000 + 5%					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
2	Divided	Yes	No	+5%		2	Undivided	11,700	18,000	24,200	32,600
2	Undivided	No	No	-20%		4	Divided	36,300	52,600	66,200	75,300
Multi	Undivided	Yes	No	-5%		6	Divided	54,600	78,800	99,400	113,100
Multi	Undivided	No	No	-25%							
—	—	—	Yes	+ 5%							
One-Way Facility Adjustment						Uninterrupted Flow Highway Adjustments					
Multiply the corresponding two-directional volumes in this table by 0.6						Lanes	Median	Exclusive left lanes	Adjustment factors		
						2	Divided	Yes	+5%		
						Multi	Undivided	Yes	-5%		
						Multi	Undivided	No	-25%		
BICYCLE MODE ²						¹Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual. ²Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility. ³Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow. * Cannot be achieved using table input value defaults. ** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults. Source: Florida Department of Transportation Systems Implementation Office https://www.fdot.gov/planning/systems/					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Paved											
Shoulder/Bicycle											
Lane Coverage	B	C	D	E							
0-49%	*	2,900	7,600	19,700							
50-84%	2,100	6,700	19,700	>19,700							
85-100%	9,300	19,700	>19,700	**							
PEDESTRIAN MODE ²											
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	2,800	9,500							
50-84%	*	1,600	8,700	15,800							
85-100%	3,800	10,700	17,400	>19,700							
BUS MODE (Scheduled Fixed Route) ³											
(Buses in peak hour in peak direction)											
Sidewalk Coverage	B	C	D	E							
0-84%	> 5	≥ 4	≥ 3	≥ 2							
85-100%	> 4	≥ 3	≥ 2	≥ 1							

TABLE 1
(continued)

Generalized **Annual Average Daily** Volumes for Florida's
Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials			Class I		
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways		Arterials			Bicycle	Ped	Bus	
	Density	Two-Lane	Multilane	Class I		Class II	Score	Score	Buses/hr.	
		%ffs	Density	ats		ats				
B	≤ 17	> 83.3	≤ 17	> 31 mph		> 22 mph	≤ 2.75	≤ 2.75	≤ 6	
C	≤ 24	> 75.0	≤ 24	> 23 mph		> 17 mph	≤ 3.50	≤ 3.50	≤ 4	
D	≤ 31	> 66.7	≤ 31	> 18 mph		> 13 mph	≤ 4.25	≤ 4.25	< 3	
E	≤ 39	> 58.3	≤ 35	> 15 mph		> 10 mph	≤ 5.00	≤ 5.00	< 2	

% ffs = Percent free flow speed ats = Average travel speed

TABLE 2

**Generalized Annual Average Daily Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas¹**

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes

Median

B

C

D

E

2

Undivided

*

14,400

16,200

**

4

Divided

*

34,000

35,500

**

6

Divided

*

52,100

53,500

**

Class II (35 mph or slower posted speed limit)

Lanes

Median

B

C

D

E

2

Undivided

*

6,500

13,300

14,200

4

Divided

*

9,900

28,800

31,600

6

Divided

*

16,000

44,900

47,600

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes

Median

Exclusive Left Lanes

Exclusive Right Lanes

Adjustment Factors

2

Divided

Yes

No

+5%

2

Undivided

No

No

-20%

Multi

Undivided

Yes

No

-5%

Multi

Undivided

No

No

-25%

—

—

—

Yes

+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE²

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle

Lane Coverage

B

C

D

E

0-49%

*

2,600

6,100

19,500

50-84%

1,900

5,500

18,400

>19,500

85-100%

7,500

19,500

>19,500

**

PEDESTRIAN MODE²

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage

B

C

D

E

0-49%

*

*

2,800

9,400

50-84%

*

1,600

8,600

15,600

85-100%

3,800

10,500

17,100

>19,500

BUS MODE (Scheduled Fixed Route)³

(Buses in peak hour in peak direction)

Sidewalk Coverage

B

C

D

E

0-84%

> 5

≥ 4

≥ 3

≥ 2

85-100%

> 4

> 3

> 2

> 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes

B

C

D

E

4

45,100

59,000

70,300

72,600

6

65,300

86,600

104,100

108,900

8

85,900

114,500

138,100

145,300

10

101,600

135,600

161,900

181,800

Freeway Adjustments

Auxiliary Lanes

Present in Both Directions

+ 20,000

Ramp Metering

+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes

Median

B

C

D

E

2

Undivided

11,300

17,300

23,400

31,600

4

Divided

34,600

49,900

63,000

71,700

6

Divided

51,700

74,800

94,600

107,400

Uninterrupted Flow Highway Adjustments

Lanes

Median

Exclusive left lanes

Adjustment factors

2

Divided

Yes

+5%

Multi

Undivided

Yes

-5%

Multi

Undivided

No

-25%

¹Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

²Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

³Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
<https://www.fdot.gov/planning/systems/>

TABLE 2
(continued)
Generalized Annual Average Daily Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n
LEVEL OF SERVICE THRESHOLDS									
Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus	
	Density	Two-Lane	Multilane	Class I	Class II	Score	Score	Buses/hr.	
		%ffs	Density	ats	ats				
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6	
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4	
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3	
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2	

% ffs = Percent free flow speed ats = Average travel speed

TABLE 3

Generalized **Annual Average Daily** Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population¹

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	12,900	14,200	**	4	34,800	48,000	56,700	63,200	
4	Divided	*	29,300	30,400	**	6	48,900	69,000	82,600	94,800	
6	Divided	*	45,200	45,800	**	8	62,900	90,400	108,400	126,400	
Non-State Signalized Roadway Adjustments (Alter corresponding state volumes by the indicated percent.) Non-State Signalized Roadways - 10%						Freeway Adjustments Auxiliary Lanes Present in Both Directions + 20,000					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Rural Undeveloped					
2	Divided	Yes	No	+5%		Lanes	Median	B	C	D	E
2	Undivided	No	No	-20%		2	Undivided	4,600	8,600	14,000	28,500
Multi	Undivided	Yes	No	-5%		4	Divided	31,200	44,900	55,700	62,700
Multi	Undivided	No	No	-25%		6	Divided	46,800	67,600	83,500	94,200
—	—	—	Yes	+ 5%		Developed Areas					
One-Way Facility Adjustment Multiply the corresponding two-directional volumes in this table by 0.6						Lanes	Median	B	C	D	E
						2	Undivided	10,300	15,700	21,300	28,500
						4	Divided	29,300	42,300	54,000	61,600
						6	Divided	44,000	63,600	81,200	92,400
BICYCLE MODE² (Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						Passing Lane Adjustments Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length					
Rural Undeveloped						Uninterrupted Flow Highway Adjustments					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E		Lanes	Median	Exclusive left lanes	Adjustment factors		
0-49%	*	1,300	2,000	3,200		2	Divided	Yes	+5%		
50-84%	1,000	2,100	3,200	10,600		Multi	Undivided	Yes	-5%		
85-100%	2,600	3,900	18,500	>18,500		Multi	Undivided	No	-25%		
Developed Areas						¹ Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E		² Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.					
0-49%	*	2,300	4,900	15,600		* Cannot be achieved using table input value defaults.					
50-84%	1,700	4,500	13,300	18,500		** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
85-100%	5,900	18,500	>18,500	**		Source: Florida Department of Transportation Systems Implementation Office https://www.fdot.gov/planning/systems/					
PEDESTRIAN MODE² (Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	2,700	9,200							
50-84%	*	1,500	8,400	14,900							
85-100%	3,600	10,200	16,700	>19,200							

TABLE 3
(continued)

Generalized Annual Average Daily Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials	Bicycle	Pedestrian		
		Undeveloped		Developed						
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways					Arterials	Bicycle	Pedestrian	
		Two-Lane ru		Two-Lane rd		Multilane ru				Multilane rd
	Density	%tsf	ats	%ffs	Density	Density				
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14				
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22				
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29				
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34				
Level of Service	Arterials		Bicycle		Pedestrian					
	Major City/Co.(ats)		Score		Score					
B	> 31 mph		≤ 2.75		≤ 2.75					
C	> 23 mph		≤ 3.50		≤ 3.50					
D	> 18 mph		≤ 4.25		≤ 4.25					
E	> 15 mph		< 5.00		< 5.00					

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's
Urbanized Areas¹

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Core Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	1,510	1,600	**	4	4,050	5,640	6,800	7,420	
4	Divided	*	3,420	3,580	**	6	5,960	8,310	10,220	11,150	
6	Divided	*	5,250	5,390	**	8	7,840	10,960	13,620	14,850	
8	Divided	*	7,090	7,210	**	10	9,800	13,510	17,040	18,580	
						12	11,600	16,350	20,930	23,200	
Class II (35 mph or slower posted speed limit)						Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	660	1,330	1,410	4	4,130	5,640	7,070	7,690	
4	Divided	*	1,310	2,920	3,040	6	6,200	8,450	10,510	11,530	
6	Divided	*	2,090	4,500	4,590	8	8,270	11,270	13,960	15,380	
8	Divided	*	2,880	6,060	6,130	10	10,350	14,110	17,310	19,220	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lanes					
Non-State Signalized Roadways						Present in Both Directions					
						+ 1,800					
Ramp Metering						+ 5%					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
2	Divided	Yes	No	+5%		2	Undivided	1,050	1,620	2,180	2,930
2	Undivided	No	No	-20%		4	Divided	3,270	4,730	5,960	6,780
Multi	Undivided	Yes	No	-5%		6	Divided	4,910	7,090	8,950	10,180
Multi	Undivided	No	No	-25%							
—	—	—	Yes	+ 5%							
One-Way Facility Adjustment						Uninterrupted Flow Highway Adjustments					
Multiply the corresponding two-directional volumes in this table by 0.6						Lanes	Median	Exclusive left lanes	Adjustment factors		
						2	Divided	Yes	+5%		
						Multi	Undivided	Yes	-5%		
						Multi	Undivided	No	-25%		
BICYCLE MODE ²						¹ Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						² Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.					
Paved						³ Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.					
Shoulder/Bicycle						* Cannot be achieved using table input value defaults.					
Lane Coverage	B	C	D	E		** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
0-49%	*	260	680	1,770		Source:					
50-84%	190	600	1,770	>1,770		Florida Department of Transportation					
85-100%	830	1,700	>1,770	**		Systems Implementation Office					
PEDESTRIAN MODE ²						https://www.fdot.gov/planning/systems/					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	250	850							
50-84%	*	150	780	1,420							
85-100%	340	960	1,560	>1,770							
BUS MODE (Scheduled Fixed Route) ³											
(Buses in peak hour in peak direction)											
Sidewalk Coverage	B	C	D	E							
0-84%	> 5	≥ 4	≥ 3	≥ 2							
85-100%	> 4	≥ 3	≥ 2	≥ 1							

TABLE 4
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's
Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials			Class I		
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways		Arterials			Bicycle	Ped	Bus	
	Density	Two-Lane	Multilane	Class I ats	Class II ats		Score	Score	Buses/hr.	
		%ffs	Density							
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph		≤ 2.75	≤ 2.75	≤ 6	
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph		≤ 3.50	≤ 3.50	≤ 4	
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph		≤ 4.25	≤ 4.25	< 3	
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph		≤ 5.00	≤ 5.00	< 2	

% ffs = Percent free flow speed ats = Average travel speed

TABLE 5

**Generalized Peak Hour Two-Way Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas¹**

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,300	1,460	**
4	Divided	*	3,060	3,200	**
6	Divided	*	4,690	4,820	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	580	1,200	1,280
4	Divided	*	890	2,590	2,850
6	Divided	*	1,440	4,040	4,280

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
—	—	—	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE²

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle

Lane Coverage	B	C	D	E
0-49%	*	140	550	1,760
50-84%	170	500	1,650	>1,760
85-100%	670	1,760	>1,760	**

PEDESTRIAN MODE²

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,410
85-100%	340	950	1,540	>1,760

BUS MODE (Scheduled Fixed Route)³

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	4,420	5,780	6,890	7,110
6	6,400	8,490	10,200	10,670
8	8,420	11,220	13,530	14,240
10	9,960	13,290	15,870	17,820

Freeway Adjustments

Auxiliary Lanes Present in Both Directions + 1,800	Ramp Metering + 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	1,020	1,560	2,110	2,840
4	Divided	3,110	4,490	5,670	6,450
6	Divided	4,650	6,730	8,510	9,670

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

¹Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

²Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

³Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
<https://www.fdot.gov/planning/systems/>

¹Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

²Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

³Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
<https://www.fdot.gov/planning/systems/>

TABLE 5

(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n
LEVEL OF SERVICE THRESHOLDS									
Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus	
	Density	Two-Lane	Multilane	Class I	Class II	Score	Score	Buses/hr.	
		%ffs	Density	ats	ats				
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6	
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4	
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3	
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2	

% ffs = Percent free flow speed ats = Average travel speed

TABLE 6

Generalized **Peak Hour Two-Way** Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population¹

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
2	Undivided	*	1,220	1,350	**	4	3,650	5,040	5,950	6,640	
4	Divided	*	2,790	2,890	**	6	5,130	7,250	8,670	9,950	
6	Divided	*	4,300	4,350	**	8	6,600	9,490	11,380	13,270	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lanes					
Non-State Signalized Roadways						Present in Both Directions					
						+ 1,800					
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
						Rural Undeveloped					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
2	Divided	Yes	No	+5%		2	Undivided	440	820	1,330	2,710
2	Undivided	No	No	-20%		4	Divided	2,960	4,270	5,290	5,960
Multi	Undivided	Yes	No	-5%		6	Divided	4,450	6,420	7,930	8,950
Multi	Undivided	No	No	-25%							
—	—	—	Yes	+ 5%		Developed Areas					
One-Way Facility Adjustment						Lanes	Median	B	C	D	E
Multiply the corresponding two-directional volumes in this table by 0.6						2	Undivided	980	1,490	2,020	2,710
						4	Divided	2,780	4,020	5,130	5,850
						6	Divided	4,180	6,040	7,710	8,780
BICYCLE MODE²						Passing Lane Adjustments					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						Alter LOS B-D in proportion to the passing lane length to the highway segment length					
Rural Undeveloped						Uninterrupted Flow Highway Adjustments					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E		Lanes	Median	Exclusive left lanes	Adjustment factors		
0-49%	*	120	190	300		2	Divided	Yes	+5%		
50-84%	100	200	310	1,010		Multi	Undivided	Yes	-5%		
85-100%	250	370	1,760	>1,760		Multi	Undivided	No	-25%		
Developed Areas						¹ Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E		² Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.					
0-49%	*	220	460	1,480		* Cannot be achieved using table input value defaults.					
50-84%	170	430	1,270	>1,760		** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
85-100%	560	1,760	>1,760	**		Source: Florida Department of Transportation Systems Implementation Office https://www.fdot.gov/planning/systems/					
PEDESTRIAN MODE²											
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	220	840							
50-84%	*	120	780	1,390							
85-100%	320	940	1,560	>1,820							

TABLE 6
(continued)

Generalized Peak Hour Two-Way Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials	Bicycle	Pedestrian		
		Undeveloped		Developed						
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways					Arterials	Bicycle	Pedestrian	
		Two-Lane ru		Two-Lane rd		Multilane ru				Multilane rd
		Density	%tsf	ats	%ffs	Density				Density
B	≤ 14	≤ 50	≤ 55	> 83.3		≤ 14	≤ 14			
C	≤ 22	≤ 65	≤ 50	> 75.0		≤ 22	≤ 22			
D	≤ 29	≤ 80	≤ 45	> 66.7		≤ 29	≤ 29			
E	≤ 36	> 80	≤ 40	> 58.3		≤ 34	≤ 34			
Level of Service	Arterials			Bicycle		Pedestrian				
	Major City/Co.(ats)			Score		Score				
B	> 31 mph			≤ 2.75		≤ 2.75				
C	> 23 mph			≤ 3.50		≤ 3.50				
D	> 18 mph			≤ 4.25		≤ 4.25				
E	> 15 mph			< 5.00		< 5.00				

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 7

Generalized **Peak Hour Directional** Volumes for Florida's
Urbanized Areas

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Core Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	830	880	**	2	2,230	3,100	3,740	4,080	
2	Divided	*	1,910	2,000	**	3	3,280	4,570	5,620	6,130	
3	Divided	*	2,940	3,020	**	4	4,310	6,030	7,490	8,170	
4	Divided	*	3,970	4,040	**	5	5,390	7,430	9,370	10,220	
						6	6,380	8,990	11,510	12,760	
Class II (35 mph or slower posted speed limit)						Urbanized					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	370	750	800	2	2,270	3,100	3,890	4,230	
2	Divided	*	730	1,630	1,700	3	3,410	4,650	5,780	6,340	
3	Divided	*	1,170	2,520	2,560	4	4,550	6,200	7,680	8,460	
4	Divided	*	1,610	3,390	3,420	5	5,690	7,760	9,520	10,570	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lane		Ramp Metering			
Non-State Signalized Roadways - 10%						+ 1,000		+ 5%			
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Lanes	Median	B	C	D	E
1	Divided	Yes	No	+5%		1	Undivided	580	890	1,200	1,610
1	Undivided	No	No	-20%		2	Divided	1,800	2,600	3,280	3,730
Multi	Undivided	Yes	No	-5%		3	Divided	2,700	3,900	4,920	5,600
Multi	Undivided	No	No	-25%							
—	—	—	Yes	+ 5%							
One-Way Facility Adjustment						Uninterrupted Flow Highway Adjustments					
Multiply the corresponding directional volumes in this table by 1.2						Lanes	Median	Exclusive left lanes		Adjustment factors	
						1	Divided	Yes		+5%	
						Multi	Undivided	Yes		-5%	
						Multi	Undivided	No		-25%	
BICYCLE MODE ²						¹ Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Paved											
Shoulder/Bicycle						² Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.					
Lane Coverage	B	C	D	E							
0-49%	*	150	390	1,000							
50-84%	110	340	1,000	>1,000	³ Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.						
85-100%	470	1,000	>1,000	**							
PEDESTRIAN MODE ²						* Cannot be achieved using table input value defaults.					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.					
Sidewalk Coverage	B	C	D	E	Source: Florida Department of Transportation Systems Implementation Office https://www.fdot.gov/planning/systems/						
0-49%	*	*	140	480							
50-84%	*	80	440	800							
85-100%	200	540	880	>1,000							
BUS MODE (Scheduled Fixed Route) ³											
(Buses in peak hour in peak direction)											
Sidewalk Coverage	B	C	D	E							
0-84%	> 5	≥ 4	≥ 3	≥ 2							
85-100%	> 4	≥ 3	≥ 2	≥ 1							

TABLE 7
(continued)

**Generalized Peak Hour Directional Volumes for Florida's
Urbanized Areas**

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials			Class I		
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus		
	Density	Two-Lane %ffs	Multilane Density	Class I ats	Class II ats	Score	Score	Buses/hr.		
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6		
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4		
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3		
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2		

% ffs = Percent free flow speed ats = Average travel speed

TABLE 8

**Generalized Peak Hour Directional Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas¹**

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Class I (40 mph or higher posted speed limit)						Lanes	B	C	D	E	
Lanes	Median	B	C	D	E	2	2,430	3,180	3,790	3,910	
1	Undivided	*	710	800	**	3	3,520	4,670	5,610	5,870	
2	Divided	*	1,740	1,820	**	4	4,630	6,170	7,440	7,830	
3	Divided	*	2,670	2,740	**	5	5,480	7,310	8,730	9,800	
Class II (35 mph or slower posted speed limit)						Freeway Adjustments					
Lanes	Median	B	C	D	E	Auxiliary Lane	Ramp Metering				
1	Undivided	*	330	680	720	+ 1,000	+ 5%				
2	Divided	*	500	1,460	1,600						
3	Divided	*	810	2,280	2,420						
Non-State Signalized Roadway Adjustments (Alter corresponding state volumes by the indicated percent.)											
Non-State Signalized Roadways - 10%											
Median & Turn Lane Adjustments											
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors							
1	Divided	Yes	No	+5%							
1	Undivided	No	No	-20%							
Multi	Undivided	Yes	No	-5%							
Multi	Undivided	No	No	-25%							
—	—	—	Yes	+ 5%							
One-Way Facility Adjustment Multiply the corresponding directional volumes in this table by 1.2											
BICYCLE MODE ² (Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Paved Shoulder/Bicycle Lane Coverage						B	C	D	E		
0-49%						*	140	320	1,000		
50-84%						100	280	940	>1,000		
85-100%						380	1,000	>1,000	**		
PEDESTRIAN MODE ² (Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage						B	C	D	E		
0-49%						*	*	140	480		
50-84%						*	80	440	800		
85-100%						200	540	880	>1,000		
BUS MODE (Scheduled Fixed Route) ³ (Buses in peak hour in peak direction)											
Sidewalk Coverage						B	C	D	E		
0-84%						> 5	≥ 4	≥ 3	≥ 2		
85-100%						> 4	≥ 3	≥ 2	≥ 1		

TABLE 8
(continued)

**Generalized Peak Hour Directional Volumes for Florida's
Transitioning Areas and
Areas Over 5,000 Not In Urbanized Areas**

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n
LEVEL OF SERVICE THRESHOLDS									
Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus	
	Density	Two-Lane	Multilane	Class I	Class II	Score	Score	Buses/hr.	
		%ffs	Density	ats	ats				
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6	
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4	
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3	
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2	

% ffs = Percent free flow speed ats = Average travel speed

TABLE 9

Generalized Peak Hour Directional Volumes for Florida's
Rural Undeveloped Areas and
Developed Areas Less Than 5,000 Population¹

January 2020

INTERRUPTED FLOW FACILITIES						UNINTERRUPTED FLOW FACILITIES					
STATE SIGNALIZED ARTERIALS						FREEWAYS					
Lanes	Median	B	C	D	E	Lanes	B	C	D	E	
1	Undivided	*	670	740	**	2	2,010	2,770	3,270	3,650	
2	Divided	*	1,530	1,580	**	3	2,820	3,990	4,770	5,470	
3	Divided	*	2,360	2,400	**	4	3,630	5,220	6,260	7,300	
Non-State Signalized Roadway Adjustments						Freeway Adjustments					
(Alter corresponding state volumes by the indicated percent.)						Auxiliary Lane + 1,000					
Non-State Signalized Roadways - 10%											
Median & Turn Lane Adjustments						UNINTERRUPTED FLOW HIGHWAYS					
Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors		Rural Undeveloped					
1	Divided	Yes	No	+5%		Lanes	Median	B	C	D	E
1	Undivided	No	No	-20%		1	Undivided	240	450	730	1,490
Multi	Undivided	Yes	No	-5%		2	Divided	1,630	2,350	2,910	3,280
Multi	Undivided	No	No	-25%		3	Divided	2,450	3,530	4,360	4,920
—	—	—	Yes	+ 5%		Developed Areas					
One-Way Facility Adjustment						Lanes	Median	B	C	D	E
Multiply the corresponding directional volumes in this table by 1.2						1	Undivided	540	820	1,110	1,490
						2	Divided	1,530	2,210	2,820	3,220
						3	Divided	2,300	3,320	4,240	4,830
BICYCLE MODE²						Passing Lane Adjustments					
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)						Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length					
Rural Undeveloped						Uninterrupted Flow Highway Adjustments					
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E		Lanes	Median	Exclusive left lanes	Adjustment factors		
0-49%	*	70	110	170		1	Divided	Yes	+5%		
50-84%	60	120	180	580		Multi	Undivided	Yes	-5%		
85-100%	140	210	1,000	>1,000		Multi	Undivided	No	-25%		
Developed Areas											
Paved Shoulder/Bicycle Lane Coverage	B	C	D	E							
0-49%	*	120	260	840							
50-84%	100	240	720	1,000							
85-100%	320	1,000	>1,000	**							
PEDESTRIAN MODE²											
(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)											
Sidewalk Coverage	B	C	D	E							
0-49%	*	*	120	460							
50-84%	*	80	430	770							
85-100%	180	520	860	>1,000							

¹Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

²Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
 Florida Department of Transportation
 Systems Implementation Office
<https://www.fdot.gov/planning/systems/>

TABLE 9
(continued)

Generalized Peak Hour Directional Volumes for Florida's
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January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways				Arterials	Bicycle	Pedestrian		
		Undeveloped	Developed							
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n
LEVEL OF SERVICE THRESHOLDS										
Level of Service	Freeways	Highways								
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd				
	Density	%tsf	ats	%ffs	Density	Density				
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14				
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22				
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29				
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34				
Level of Service	Arterials			Bicycle		Pedestrian				
	Major City/Co.(ats)			Score		Score				
B	> 31 mph			≤ 2.75		≤ 2.75				
C	> 23 mph			≤ 3.50		≤ 3.50				
D	> 18 mph			≤ 4.25		≤ 4.25				
E	> 15 mph			< 5.00		< 5.00				

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

