PROJECT TRAFFIC ANALYSIS REPORT

SR 5/US-1 at Aviation Boulevard
Project Development and Environment (PD&E) Study

Indian River County, Florida | FM# 441693-1-22-02 | ETDM Number:14475

Prepared for

FDOT

Florida Department of Transportation - District Four
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PROJECT TRAFFIC ANALYSIS REPORT (PTAR)

Florida Department of Transportation

District Four

SR 5/US-1 at Aviation Boulevard

Project Development and Environment (PD&E) Study

Limits of Project: From 21st Street to 41st Street

Indian River County, Florida

Financial Management Number: 441693-1-22-02

ETDM Number: 14475

Date: February 13, 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

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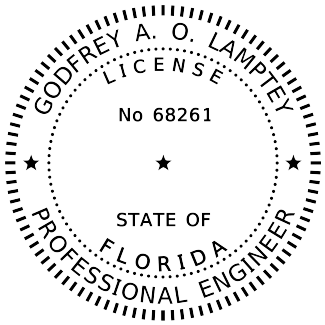

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The project intersection of SR 5/US-1 and Aviation Boulevard is located within the urbanized area of the City of Vero Beach in Indian River County, Florida. This is a 4-legged, signalized intersection that accommodates the Florida East Coast (FEC) Railroad at-grade crossing along the west leg of the intersection. The FEC Railroad, which is part of the Strategic Intermodal System (SIS) Railroad Corridor, includes double-tracks running north-south parallel to SR 5/US-1 on the west side. Pedestrian crosswalks are provided on the northbound and westbound approaches of the intersection. There are no dedicated bicycle facilities. Nearby landmarks include Vero Beach Regional Airport, Cleveland Clinic, Indian River Hospital and Indian River Medical Center, and downtown Vero Beach. The intersection is near a Runway Protection Zone (RPZ) of the Vero Beach Regional Airport.

The project proposes operational and capacity improvements to the intersection of SR 5/US-1 and Aviation Boulevard/32nd Street. Various alternatives will be considered during the Project Development & Environment (PD&E) study, which may include a grade-separated crossing over the FEC Railroad. Additional features were considered such as multi-modal improvements. The project study area includes SR-5/US-1 between 21st Street and 41st Street; and along Aviation Boulevard between 27th Avenue and US-1; and 32nd Street from US 1 to 13th Avenue.

SR 5/US-1 constitutes the north and south approaches of the intersection, as a four-lane divided facility with a painted center turn-lane, curb and gutter on both sides, and a sidewalk on the east side. SR 5/US-1 has a functional classification of Urban Principal Arterial Other and a context classification of Suburban Commercial and Urban General since there are mostly non-residential land uses along the corridor with residential neighborhood connections. Indian River County has designated SR 5/US-1 corridor as a hurricane evacuation route.

At the west leg of the intersection, Aviation Boulevard crosses the FEC Railroad. This is a 2-lane undivided roadway with no pedestrian facilities. Aviation Boulevard has a functional classification of Urban Minor Arterial and a context classification of Suburban Commercial due to the non-residential land uses. 32nd Street forms the east leg of the intersection as a local 2 lane undivided street serving limited commercial and residential properties.

The county is currently evaluating extending Aviation Boulevard east from US-1 to the Cleveland Clinic Hospital. The proposed extension would connect the intersection of US-1 at Aviation Boulevard directly to 37th Street, go along the west perimeter of the hospital campus and extend north of 37th Street to 41st Street.

1.2 PURPOSE AND NEED

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.

The primary need of the project is to alleviate existing and future traffic congestion by providing improvements that meet future travel demand and capacity. According to the Indian River County Metropolitan Planning Organization (MPO) 2021 Priority Projects Report, the intersection is currently failing or nearly failing during peak periods and in peak directions. Based on the existing 2021 traffic volumes obtained as part of this study, Aviation Boulevard just west of SR 5/US-1 is operating with a LOS E with an Annual Average Daily Traffic (AADT) of 12,000. SR 5/US-1 south of Aviation Boulevard is operating at LOS C with an AADT of 26,500. SR 5/US-1 north of Aviation Boulevard is operating at LOS F with an AADT of 34,200.

The future traffic demand is projected to increase due to population and employment growth as well as planned capacity improvements in the immediate network; therefore, conditions are expected to worsen at this intersection without any improvements. Along SR 5/US-1 south of Aviation Boulevard, the AADT projected to increase by 63% from 26,500 in 2021 to 43,200 in the 2045 design year. To the north of Aviation Boulevard, the AADT along SR 5/US-1 is projected to increase by 34% from 34,200 in 2021 to 45,800 in the 2045 design year. Along Aviation Boulevard, the AADT is anticipated to increase by 70% from 12,000 in the 2021 to 20,400 in the 2045 design year.

The project also aims at improving safety at the intersection. The 2021 Florida Strategic Highway Safety Plan (FSHSP) has identified intersections as an emphasis area while rail crossings are an evolving emphasis area. A historical crash evaluation of the intersection of SR 5/US-1 and Aviation Boulevard revealed a total of 21 crashes observed over a five-year period between 2017 and 2021. Approximately 32% of these crashes resulted in injuries. Most of these crashes were rear end at approximately 41% followed by angle and left turn crashes combined at 23% and sideswipe at 18%. These types of crashes may be correlated to congested conditions at the intersection. The existing facility's safety performance crash rate was calculated at 0.92 which is significantly higher than the Statewide crash rate of 0.53 and the Districtwide crash rate of 0.34. This indicates a potential safety concern. The SR 5/US-1 corridor has been designated by Indian River County as an evacuation route.

2.0 ANALYSIS METHODOLOGY

2.1 TRAFFIC STUDY AREA

The traffic study area for this project was defined to represent the area that is anticipated to experience changes in traffic operating characteristics as a result of proposed improvements at the SR 5/US-1 and Aviation Boulevard Intersection. The project study area includes SR-5/US-1 between 21st Street and 41st Street; and along Aviation Boulevard between 27th Avenue and US-1; and 32nd Street from US 1 to 13th Avenue. However, the traffic study limits extend from 26th Street to 37th Street along SR 5/US-1 and from 27th Avenue to SR 5/US-1, along Aviation Boulevard. **Figure 2-1** illustrates the project location and traffic study area. The straight-line diagram showing the project limits noted in the Efficient Transportation Decision Making (ETDM) screening is provided in **Appendix A**.

2.2 ANALYSIS YEARS

The analysis years for the traffic forecasting and operational analysis were established as follows.

Traffic Forecasting

- Base year: 2015
- Horizon year: 2045

Traffic Operational Analysis

- Existing year: 2021
- Opening year: 2025
- Design year: 2045

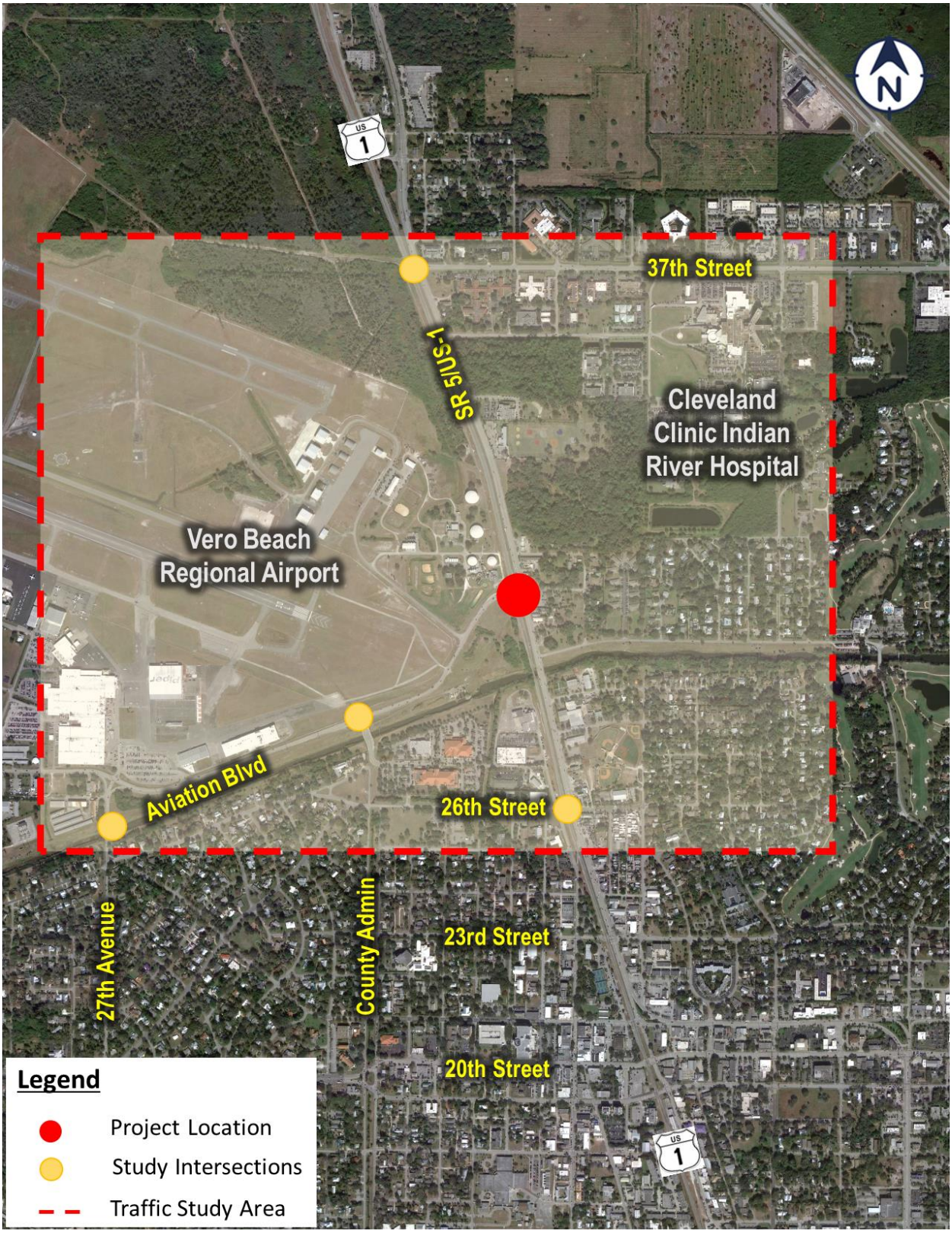


Figure 2-1 Project Location Map & Traffic Study Area

2.3 TRAFFIC FACTORS

The traffic factors for this PD&E Study were developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021, and are summarized in **Table 2-1.**

Table 2-1 Traffic Factors

Roadway	K[1]	D[2]	T_{24}	DHT[3]	Axle Correction Factor	Seasonal Factor
SR 5	9.0	52.3	4.3	2.2	0.97	1.02
Aviation Boulevard	9.0	51.9	7.9	3.9	0.78	1.02
41st Street	9.0	51.5	7.9	3.9	0.78	1.02

1 - Other Urbanized Area (Arterials and Highways)

2 - Based on Historical Count Stations (5-year average)

3 - DHT=T24/2

2.4 TRAVEL DEMAND FORECAST

2.4.1 Selected Travel Demand Model

The travel demand modeling and future year AADT forecasts for this study were developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The Treasure Coast Regional Planning Model Version 5.0 (TCRPM5) with base year 2015 and horizon year 2045 was used to estimate the future years daily forecasts for the study area. The 2045 model is based on the adopted year 2045 Regional Long-Range Transportation Plan (RLRTP) for Indian River, St. Lucie, and Martin Counties.

2.4.2 Project Traffic Forecast Development Methodology

The AADT forecast volumes for this PD&E Study was developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The traffic forecasting methodology used for this PD&E Study included an evaluation of the following forecast methodologies:

1. Regression analysis of 10 years of the most recent historical AADTs from FDOT count sites.
2. Regression analysis of 10 years of the most recent historical AADTs from FDOT combined with the adopted TCRPM5 Model
3. Growth between the base year (2015) and the validation (2045) year of the adopted TCRPM5 Model roadway volumes

4. Zonal analysis of adjacent TAZ employment and population data from the validation year and the adopted TCRPM5 Model

Based on a comparison of the growth rates on the study segment resulting from each of the evaluated forecasting methodologies, an areawide compound rate of 2.0% was recommended. This growth rate was calculated by averaging each of the rates obtained from each of the forecasting methods.

2.4.3 Design Hour Traffic Development

The design hour volumes for this PD&E Study were developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The TMTool Spreadsheet was used to forecast the turning movement volumes for the Opening Year and Design Year for the study intersections during the AM, and PM peak hours using the aforementioned K and D factors and the forecasted AADTs. Projected turns were smoothed and balanced to within a +/- 7 percent tolerance level.

2.5 TRAFFIC OPERATIONAL ANALYSIS

2.5.1 Existing And Future Conditions

Traffic operational analysis for existing and future conditions was performed using methodologies outlined in the Highway Capacity Manual 6th Edition (HCM 6). Where the HCM 6 methodology does not support the intersection characteristics, the HCM 2010 or HCM 2000 methodology was used. AM and PM peak period analysis was performed for the existing year (2021). The 2045 design year operational analysis was performed for the No-Build Alternative during both the AM and PM peak periods.

2.5.2 Analysis Tools

The following traffic operational analysis tool shown in **Table 2-2** were used for this PD&E study.

Table 2-2 Traffic Analysis Software Tools

Software		System Component		
Name	Version	Arterials	Intersections	Roundabout
SYNCHRO	11	☒	☒	☐
HCS 7	7	☐	☐	☒

2.5.3 Measures Of Effectiveness (MOE)

FDOT Topic No. 525-000-006 provides LOS targets for the State Highway System (SHS). The target LOS for the intersections and arterial segments within the area of influence is LOS "D." The following MOEs were used to evaluate the performance of the Existing Conditions, No-Build and Build Alternatives considered as listed below:

- Signalized intersections – Delay & LOS, 95th percentile queue length
- Potential for crash reduction

3.0 DATA REQUIREMENTS

1.1 DATA REQUIREMENTS AND SOURCES

The data requirements for this study included traffic counts, roadway data, proposed land use, and crash data. The sources for the data requirement included, but are not limited to:

- Historical traffic counts obtained from FDOT's Florida Traffic Information (FTI) Online
- Existing signal timing obtained from the Indian River County
- FDOT Straight Line Diagrams (SLD) and Roadway Characteristic Inventory (RCI)
- Crash data obtained from FDOT's Crash Analysis and Reporting (CAR) database.
- Land use data obtained from Indian River County and the MPO
- Indian River County 2045 Long Range Transportation Plan (LRTP)
- Indian River County MPO Transportation Improvement Program (TIP)
- Previous planning studies within the study area obtained from FDOT.
- Local Government Transportation Plans (LGTP), FDOT Five-Year Work Program, Master Plans, and approved traffic studies within the study area

1.2 DATA COLLECTION METHODOLOGY

The existing traffic data was collected in May 2021 on typical weekdays from 05/25/2021 to 05/27/2021 (Tuesday, Wednesday, and Thursday) at the intersections within the vicinity of the Aviation Boulevard Intersection. This data collection effort was performed during the peak season for traffic. The traffic count locations are shown in **Figure 3-1** and documented under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021.

3.1.1 3 Day 8-Hour Intersection TMC + 72-Hour Approach Counts

1. SR 5/US-1 at Aviation Boulevard
2. SR 5/US-1 at 26th Street

3.1.2 8–Hour Intersection TMC

1. SR 5/US-1 at 37th Street
2. Aviation Boulevard at County Admin
3. Aviation Boulevard at 27th Avenue

3.1.3 72 Hour Arterial ADT Counts

1. SR 5/US-1, north of 37th Street
2. 37th Street, east of SR 5/US-1
3. SR 5/US-1, south of 30th Street
4. 30th Street, east of SR 5/US-1
5. 27th Street, south of Aviation Boulevard
6. Aviation Boulevard between 27th Street and 27th Avenue
7. Aviation Boulevard, west of 27th Avenue
8. 27th Avenue, south of Aviation Boulevard

3.1.4 72 Hour Vehicular Classification Counts (Arterial)

1. SR 5/US-1, south of 37th Street
2. Aviation Boulevard between Airport N Drive and 27th Street.

3.1.5 Big Data Validation

The traffic data developed from the 'Big Data" was utilized to determine if the existing counts need to be normalized, due to the recent changes in traffic volumes and patterns associated with the COVID-19 pandemic. The Big Data set that was utilized was under "pre-COVID" conditions. The results from the 'Big Data' analysis compared well with the field data. Hence, no adjustments were made to the field collected data. Refer to the *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021, for details.

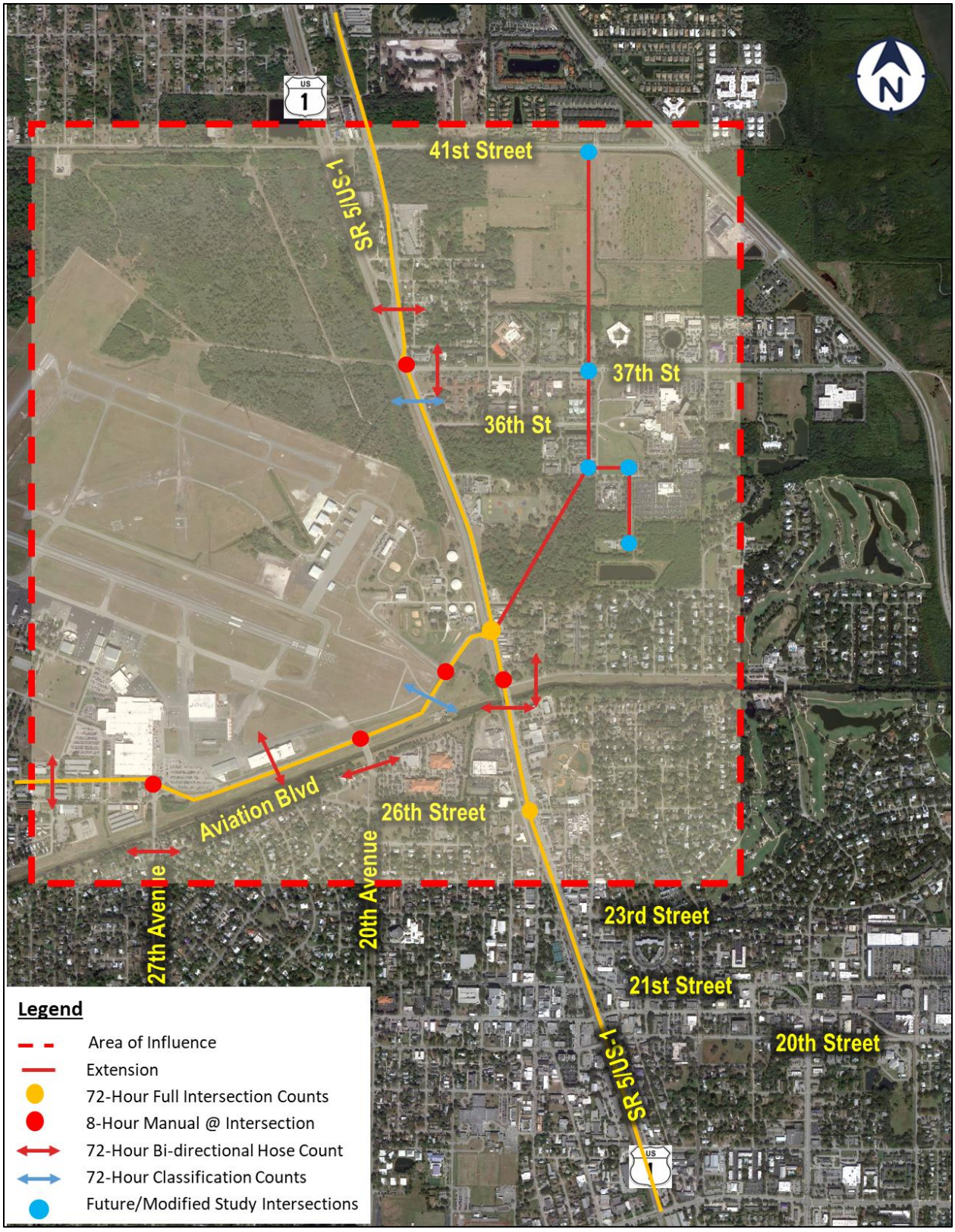


Figure 3-1 Traffic Count Locations

4.0 EXISTING CONDITIONS

4.1 EXISTING TRAFFIC VOLUMES

4.1.1 Annual Average Daily Traffic (AADT) Volumes

Daily traffic counts recorded by 15-minute intervals were obtained for all the study intersections approaches for a three-day period from 05/25/2021 to 05/27/2021 (See **Appendix B**). The Average Daily Traffic (ADT) volume was then estimated as the average of the three-day counts. The Annual Average Daily Traffic (AADT) was computed by applying the seasonal factor (SF) and axle factor (AF) as identified in **Table 2-1**. **Figure 4-1** shows the existing AADT volumes obtained for the various roadway segments within the study area.

4.1.2 Intersection Turning Movement Volumes (TMV)

Six-hour vehicle turning movement counts (TMCs) were obtained as part of the data collection effort for the following study intersections.

1. SR 5/US-1 & Aviation Blvd.
2. SR 5/US-1 & 26th Street
3. SR 5/US-1 & 37th Street
4. 27th Avenue & Aviation Blvd
5. County Admin & Aviation Blvd

The TMCs consist of 3 hours during the morning peak period (from 6:00 am to 9:00 am), and 3 hours during the evening peak period (from 4:00 pm to 7:00 pm). The TMCs were obtained for three consecutive days from 05/25/2021 to 05/27/2021 (See **Appendix B**). The peak hours for the AM and PM peak periods were established by analyzing the 72- hour machine counts to find a single window for the morning (AM) and evening (PM) peak periods. The existing turning movement volumes for the AM and PM peak hours are summarized in **Figure 4-2** and **Figure 4-3**.

4.1.3 Signal Timings

Traffic signal timing information was obtained from the Indian River County Traffic Engineering Division for the intersections in the study area and incorporated into the existing conditions analysis. Details of the signal phasing and timing plans are provided in **Appendix C**.

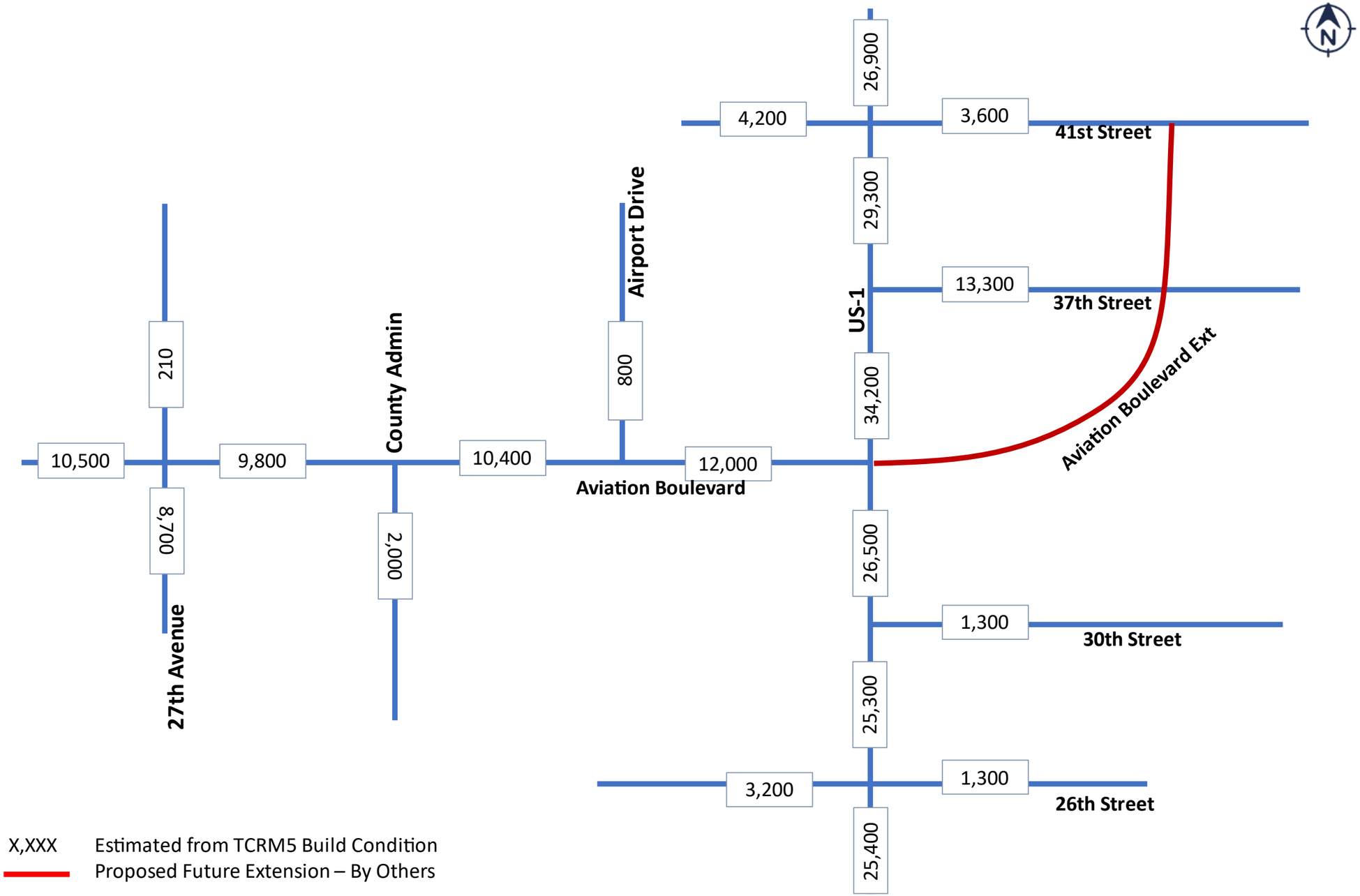


Figure 4-1 2021 Existing Annual Average Daily Traffic (AADT) Volumes

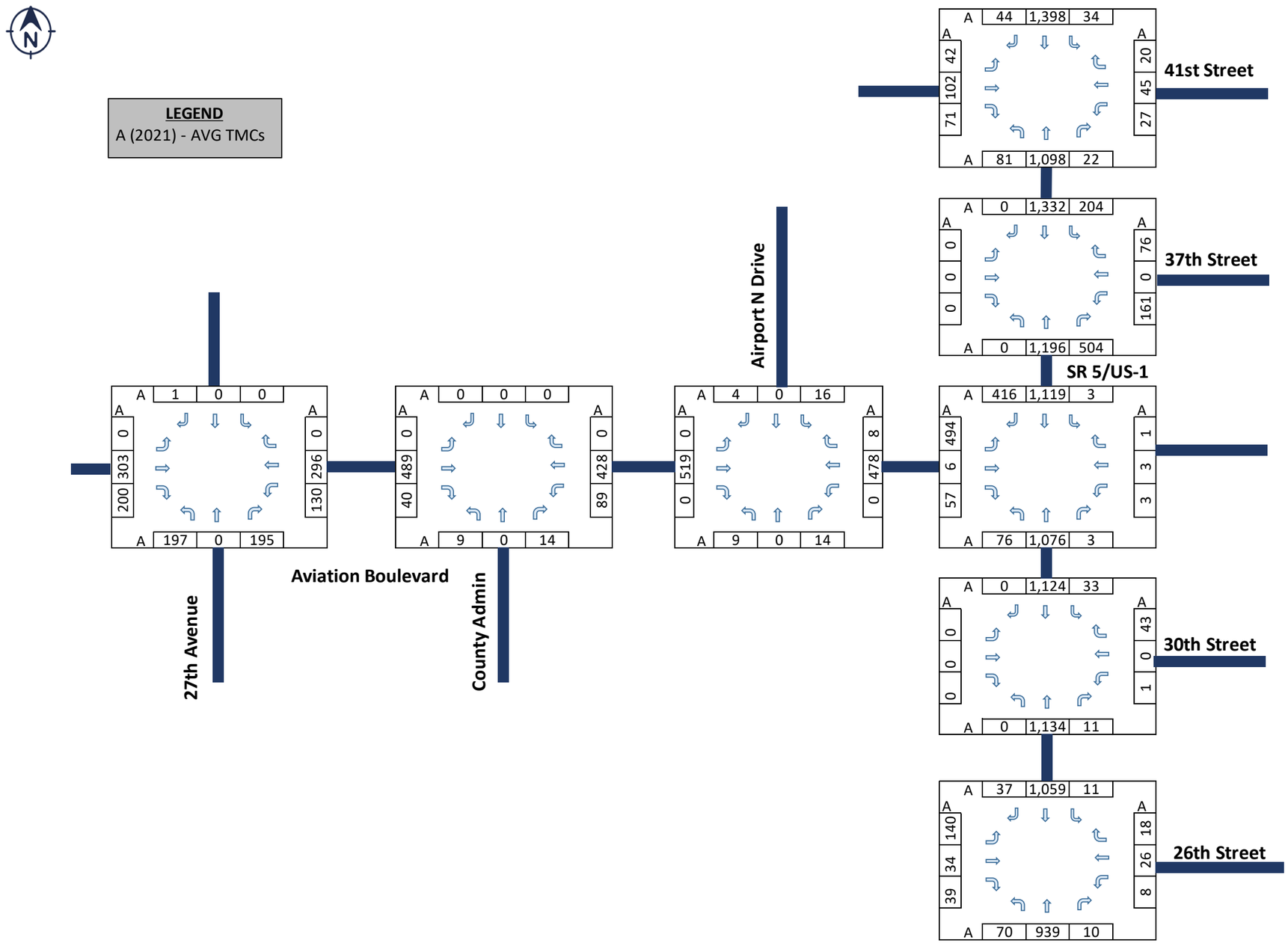


Figure 4-2 Existing Intersection Turning Movement Volumes – AM Peak Period

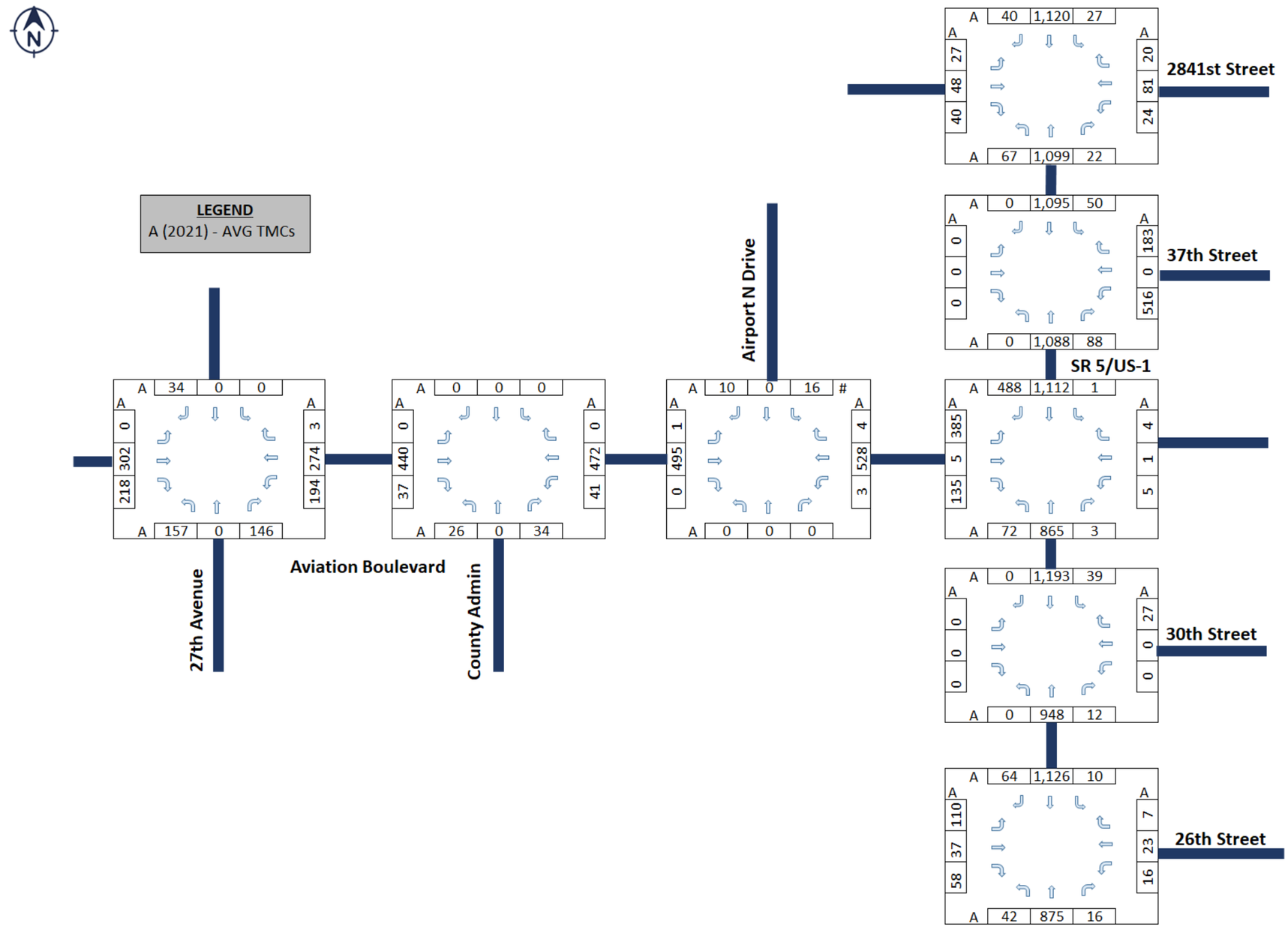


Figure 4-3 Existing Intersection Turning Movement Volumes – PM Peak Period

4.2 SIGNALIZED INTERSECTION OPERATIONS

Existing traffic conditions for signalized intersections were analyzed using HCM 6 methodology. SYNCHRO 11 software was used to perform the analysis. The analysis was performed for AM and PM peak periods. **Table 4-1** and **Table 4-2** show the existing conditions LOS analysis results for the signalized intersections. The detailed results are provided in **Appendix D**.

The analysis results show that all the existing signalized intersections are operating at an overall LOS D or better during the peak periods. The SR 5/US-1 at Aviation Blvd intersection operates at an overall LOS C during the AM peak period and LOS D during the PM peak period. However, the eastbound approach operates at LOS E and the westbound approach operates at LOS F during both the AM and PM peak periods. The following intersection approaches are operating at LOS E or F.

- **AM and PM Peak Periods**
  - Eastbound and westbound approaches at SR 5/US-1 & Aviation Blvd.
  - Eastbound and westbound approaches at SR 5/US-1 & 26th Street
  - Westbound approach at SR 5/US-1 & 37th Street

Table 4-1 2021 Existing Intersections Level of Service - AM Peak Period

No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	61.5	E	107.4	F	14.0	B	29.8	C	29.7	C
2	SR 5/US-1 & 26th Street	67.8	E	71.4	E	9.2	A	48.8	D	34.4	C
3	SR 5/US-1 & 37th Street	-	-	69.1	E	13.6	B	9.0	A	15.4	B
4	27th Avenue & Aviation Blvd	12.1	B	6.9	A	-	-	66.8	E	15.5	B
5	County Admin & Aviation Blvd	13.1	B	5.4	A	18.6	B	-	-	9.5	A

Table 4-2 2021 Existing Intersections Level of Service - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	68.3	E	105.1	F	34.9	C	44.7	D	46.3	D
2	SR 5/US-1 & 26th Street	70.0	E	74.5	E	7.3	A	41.3	D	31.3	C
3	SR 5/US-1 & 37th Street	-	-	64.1	E	17.3	B	10.2	B	25.5	C
4	27th Avenue & Aviation Blvd	19.0	B	10.4	B	-	-	41.7	D	19.9	B
5	County Admin & Aviation Blvd	11.1	B	5.6	A	18.4	B	-	-	8.8	A

4.3 SIGNALIZED INTERSECTION QUEUE ANALYSIS

A queuing analysis was performed as part of the study to determine the adequacy of the existing turn lane storage lengths for the intersections within the study area. For this analysis, the 95th percentile vehicular queue length in feet (ft.) for exclusive left and right turn movements at each of the study intersections were evaluated and compared against the existing storage distance to determine if the available storage lengths provided can accommodate the vehicular demands. **Table 4-3** compares the 95th percentile queues for the turning movements with the existing storage lengths and identifies instances where the estimated queue exceeds the storage capacity.

Table 4-3 2021 Existing Intersection Queue Length								
No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Existing Storage (ft)	Storage Deficiency
1	SR 5/US-1 & Aviation Blvd.	EB	L	410	395	410	340	Yes
		NB	L	70	80	80	370	No
		SB	L	3	0	3	170	No
2	SR 5/US-1 & 26th Street	EB	L	168	135	168	180	No
			R	70	105	105	50	Yes
		WB	R	35	13	35	110	No
		NB	L	83	45	83	200	No
		SB	L	10	8	10	570	No
3	SR 5/US-1 & 37th Street	WB	L	143	425	425	200	Yes
			R	268	545	545	200	Yes
		SB	L	270	28	270	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	43	100	100	260	No
		NB	L	180	198	198	200	No
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	10	10	10	270	No
		WB	L	15	8	15	300	No
		NB	L	5	13	13	270	No
			R	0	43	43	220	No

Based on the analysis results, 5 out of the 18 (28%) locations with existing turn storages have deficient storage lengths. For the project study intersection at SR 5/US-1 and Aviation Blvd, most of the existing storage lengths can accommodate the queue lengths except for the EB left turn. It should be noted that the queues for the EB left turn at the Aviation Blvd intersection will be exacerbated by the railroad crossing delays. The detailed queue analysis results are provided in **Appendix D**.

4.4 EXISTING SAFETY ANALYSIS

Safety analysis was performed along SR 5/US-1 and Aviation Boulevard within the study area using the latest available 5 years of crash data when the study began to identify crash patterns and contributing causes. The following sections summarize the safety analysis performed.

4.4.1 Crash Data

Crash data from 2017 to 2021 for SR 5/US-1 (Roadway ID: 88010000) within the project limits were obtained from the FDOT Crash Analysis Reporting System (CARS) database. The crash data for the same analysis period for Aviation Boulevard (Roadway ID: 88000024) was obtained from the FDOT State Safety Office GIS (SSOGis) Query Tool on the Traffic Safety Web Portal. The crash data for both roadways data includes environmental and driver characteristics that were existent at the time of each crash and provides the basis for the crash data analysis. The detailed crash data is provided in **Appendix E**.

4.4.2 Crash Summary

Based on the crash analysis, a total of 102 crashes occurred on SR 5/US-1 and 8 crashes occurred along Aviation Boulevard within the study area from 2017 to 2021.

Rear-end crashes were the predominant crash type accounting for 49 (45%) of the total crashes; followed by 21 angle crashes (19%), 13 sideswipe object crashes (12%), 9 fixed object crashes (8%) and 5 left turn crashes (5%). There was 1 pedestrian crash and 1 bicycle crash both of which were attributed to failure to yield right of way. Most of the crashes (89 crashes, 80.9%) occurred under daylight conditions, while 16 crashes (14.5%) occurred during nighttime. The number of nighttime crashes is lower than the statewide percentage of 33%. Poor surface conditions contributed only marginally to the number of crashes recorded over the five-year period as 88 (80%) of the crashes occurred during clear weather conditions and 99 (90%) occurred on dry pavement surface. Only 10% of crashes (10) occurred on wet pavement. This is lower than the statewide average of 15%.

One (1) fatal crash occurred within the study limits during the five-year period. Property Damage Only (PDO) crashes accounted for 65 (59.1%) of all crashes; 44 crashes (40.0%) resulted in Injury. Among the contributing causes documented in the crash data, ‘carelessness or negligent manner’ (27 crashes, 25%), resulted in the most crashes. Other contributing causes include ‘failed to yield right-of-way’ (20 crashes, 18%), ‘followed too closely’ (20 crashes, 18%), and ‘ran red light’ (4 crashes, 4%). **Table 4-4** and **Figure 4-4** show the crash summary for the study roadway segments.

Table 4-4 SR 5/US-1 and Aviation Boulevard Crash Summary Statistics									
SR 5/US-1 and Aviation Boulevard		Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
		Year							
		2017	2018	2019	2020	2021			
CRASH TYPE	Rear End	10	10	20	9	0	49	13	44.5%
	Head On	1	0	0	0	0	1	0	0.9%
	Angle	4	3	9	5	0	21	5	19.1%
	Left Turn	2	0	2	1	0	5	1	4.5%
	Right Turn	0	2	1	0	0	3	1	2.7%
	Sideswipe	3	3	3	4	0	13	3	11.8%
	Pedestrian	0	0	1	0	0	1	0	0.9%
	Bicycle	0	1	0	0	0	1	0	0.9%
	Fixed Object	*0*	*4*	*6*	*2*	*1*	*13*	*3*	*9.5%*
	Curb	0	1	1	0	0	2	1	1.8%
	Embankment	0	0	0	1	0	1	0	0.9%
	Guardrail Face	0	1	0	0	0	1	0	0.9%
	Other Traffic Barrier	0	1	0	0	0	1	0	0.9%
	Tree (Standing)	0	0	0	0	1	1	0	0.9%
	Other Post, Pole, or Support	0	0	1	0	0	1	0	0.9%
	Other Fixed Object	0	0	1	1	0	2	0	1.8%
	Others	3	1	2	1	0	7	1	6.4%
	Total Crashes	**23**	**23**	**41**	**22**	**1**	**110**	**22**	**100.0%**
SEVERITY	PDO Crashes	14	13	23	15	0	65	13	59.1%
	Fatal Crashes	0	0	1	0	0	1	0	0.9%
	Injury Crashes	9	10	17	7	1	44	9	40.0%
LIGHTING CONDITIONS	Daylight	19	18	30	21	1	89	18	80.9%
	Dusk	1	1	3	0	0	5	1	4.5%
	Dark	3	4	8	1	0	16	3	14.5%
SURFACE CONDITIONS	Dry	23	20	34	21	1	99	20	90.0%
	Wet	0	3	7	1	0	11	2	10.0%
MONTH OF YEAR	January	1	1	5	5	0	12	2	10.9%
	February	2	0	5	2	0	9	2	8.2%
	March	3	1	3	2	1	10	2	9.1%
	April	4	2	3	1	0	10	2	9.1%
	May	0	3	3	1	0	7	1	6.4%
	June	2	1	6	1	0	10	2	9.1%
	July	3	2	6	2	0	13	3	11.8%
	August	1	3	2	2	0	8	2	7.3%
	September	2	1	0	3	0	6	1	5.5%
	October	0	5	1	1	0	7	1	6.4%
	November	4	1	2	0	0	7	1	6.4%
	December	1	3	5	2	0	11	2	10.0%
DAY OF WEEK	Monday	4	3	8	0	0	15	3	13.6%
	Tuesday	3	6	7	4	0	20	4	18.2%
	Wednesday	4	6	6	4	1	21	4	19.1%
	Thursday	2	1	6	7	0	16	3	14.5%

Table 4-4 SR 5/US-1 and Aviation Boulevard Crash Summary Statistics									
SR 5/US-1 and Aviation Boulevard		Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
		Year							
		2017	2018	2019	2020	2021			
	Friday	4	3	3	5	0	15	3	13.6%
	Saturday	5	2	4	2	0	13	3	11.8%
	Sunday	1	2	7	0	0	10	2	9.1%
HOUR OF DAY	00:00-06:00	1	0	1	0	0	2	0	1.8%
	06:00-09:00	1	1	6	2	0	10	2	9.1%
	09:00-11:00	2	4	3	2	1	12	2	10.9%
	11:00-13:00	5	3	7	5	0	20	4	18.2%
	13:00-15:00	2	4	6	4	0	16	3	14.5%
	15:00-18:00	9	7	7	8	0	31	6	28.2%
	18:00-24:00	3	4	11	1	0	19	4	17.3%
CONTRIBUTING CAUSES (VEHICLE ONLY)	No Contributing Action	4	2	2	1	0	9	2	8.2%
	Careless or Negligent Manner	8	8	8	3	0	27	5	24.5%
	Failed to Yield Right-Of-Way	5	5	7	3	0	20	4	18.2%
	Improper Backing	0	0	0	1	0	1	0	0.9%
	Improper Turn	0	1	1	0	0	2	0	1.8%
	Followed too Closely	1	1	10	8	0	20	4	18.2%
	Ran Red Light	1	0	2	1	0	4	1	3.6%
	Drove too Fast for Conditions	0	1	1	0	0	2	0	1.8%
	Improper Passing	0	0	1	1	0	2	0	1.8%
	Exceed Posted Speed	0	0	0	1	0	1	0	0.9%
	Failed To Keep in Proper Ln	0	1	0	1	0	2	0	1.8%
	Ran Off Roadway	0	0	1	0	1	2	0	1.8%
	Other Contributing Action	4	4	8	2	0	18	4	16.4%
WEATHER CONDITIONS	Clear	20	20	29	18	1	88	18	80.0%
	Cloudy	3	1	9	3	0	16	3	14.5%
	Rain	0	2	3	1	0	6	1	5.5%

Figure 4-4 Crash Summary Statistics Histograms

4.4.3 Crash Hotspots

A crash accumulation analysis was conducted along SR 5/US-1 to identify specific segments or intersections with high crash frequencies and identify possible roadway deficiencies that can be improved. The crash accumulation analysis is graphically illustrated in **Figure 4-5**. Based on analysis, the following locations were identified as high crash frequency locations i.e., greater than 20 crashes for the five-year period.

1. SR 5/US-1 & 26th Street intersection (MP 6.7-6.9)
2. SR 5/US-1 & Aviation Blvd. intersection (7.1-7.3)
3. SR 5/US-1 & 37th Street intersection (7.7-7.9)

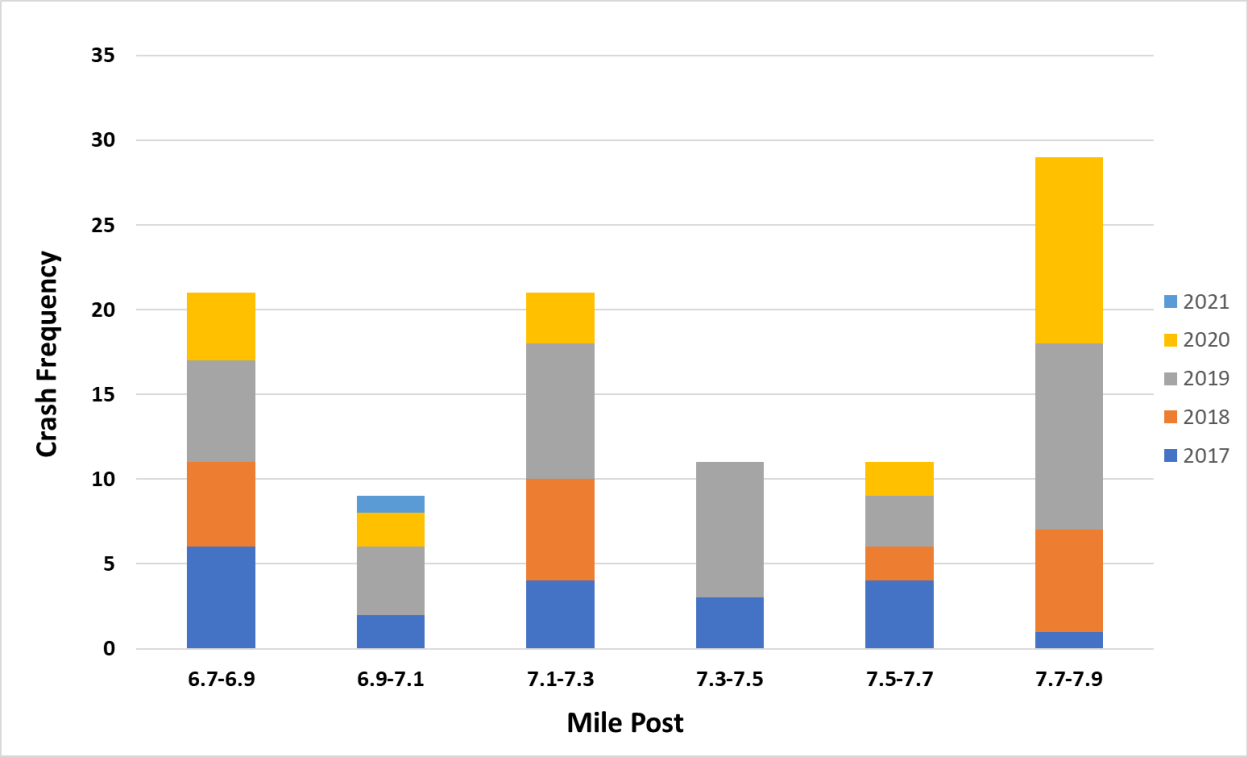


Figure 4-5 Safety Hotspots along SR 5/US-1

The Aviation Boulevard intersection with SR 5/US-1 provides access to the airport as well as the county administration offices. A total of 21 crashes occurred at this intersection from 2017 to 2021. 4 crashes occurred in 2017, 6 occurred in 2018, 9 occurred in 2019, 3 occurred in 2020, and none in 2021. Rear end crashes were the predominant crash type accounting for 41% of the total crashes, followed by angle and left turn crashes accounting for a combined 23% of the total crashes. There were no pedestrian or bicycle crashes at this location. No fatal crash occurred at this location; however, 32% of the crashes were injury crashes. Among the contributing causes

documented in the crash data, 'carelessness or negligent manner' (10 crashes) resulted in the most crashes. Other contributing causes included 'failed to yield right of way' (18%) and 'followed too closely' (18%). Most of the angle and left turn crashes occurring at this location were attributed to failure to yield right of way which may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

The 26th Street intersection with SR 5/US-1 provides access to several adjacent businesses including the Indian River County Veterans Service Office. A total of 21 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 33% of the total crashes, followed by angle crashes accounting for 29% of the total crashes. There were no pedestrian, bicycle, or fatal crashes at this location. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (24%) resulted in the most crashes. Other contributing causes included 'failed to yield right of way' (14%), 'followed too closely' (14%) and 'run red light' (14%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This intersection is operated in conjunction with the St Lucie Avenue and 26th Street intersection on the west side of the railroad. This may be contributing to inadequate signal timing and clearance time due to the railroad and not meeting driver expectancy. The mast arms at this location are also decorative with small signal heads resulting in poor signal visibility. In addition, the several adjacent driveway openings and the lack of a raised median increases the friction at this intersection.

The 37th Street intersection with SR 5/US-1 provides access to Cleveland Clinic and several medical offices. A total of 29 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 52% of the total crashes, followed by angle crashes accounting for 21% of the total crashes. There were no pedestrian crashes; however, one bicycle and one fatal crash occurred at this location. Among the contributing causes documented in the crash data, 'followed too closely' (31%) resulted in the most crashes. Other contributing causes included 'failed to yield right of way' (24%), 'carelessness or negligent manner' (21%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

4.4.4 Fatal Crashes

Fatal crashes are a major concern in roadway safety analysis. Based on the crash data, one fatal crash occurred within the study area along SR 5/US-1. There were no fatal crashes along Aviation Boulevard. The police reports for these crashes were obtained from the FDOT and reviewed to identify specific contributing factors that may have caused or influenced this fatal crash. Fatal crash descriptions, as obtained from the crash reports, are presented below.

On 05/28/2019, a vehicle traveling northbound along SR5/US-1, failed to yield right of way at the intersection of SR5/US-1 and 37th Street (MP 7.853) which resulted in an angle collision. The driver of this vehicle died due to the impact. This crash occurred under dry surface conditions and during the daytime.

5.0 ALTERNATIVES CONSIDERED

5.1 NO BUILD ALTERNATIVE

The No-Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives. It maintains the existing configuration along SR 5/US-1 and Aviation Boulevard. The intersection of SR 5/US-1 at Aviation Boulevard is a signalized intersection. SR 5/US-1 includes two through lanes and a dedicated left turn lane in both the southbound and northbound directions. Aviation Boulevard consists of one through-left-right shared lane and one exclusive left turn lane in the eastbound direction and one shared through-left-right turn lane in the westbound direction.

The No-Build Alternative also includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic in the analysis year being considered. These improvements must be part of the Department's adopted Five-Year Work Program, Indian River County Metropolitan Planning Organization (MPO) Cost Feasible Long-Range Transportation Plan (LRTP), and any developer-funded transportation improvements specified in approved Development Orders.

5.2 PRELIMINARY BUILD ALTERNATIVES

5.2.1 Intersection Control Evaluation (ICE) Process

FDOT conducted an Intersection Control Evaluation (ICE) for this project. The ICE is a process used to consider multiple context-sensitive intersection control strategies when planning a new or modified intersection. The goal of ICE is to provide a quantitative decision-making process to identify and select a control strategy that fits the location’s context, provides safe travel facilities for all road users, and offers the best overall value. As part of the PD&E Study, an ICE analysis was performed for the intersection of SR 5/US-1 and Aviation Boulevard.

The ICE Stage 1 involves two analysis components: 1) A planning level volume-to-capacity (V/C) ratio assessment using the Capacity Analysis at Junctions (CAP-X) tool; and 2) a planning level safety assessment using Safety Performance for Intersection Control Evaluation (SPICE).

The FDOT expanded version of the FHWA Capacity Analysis for Planning of Junctions (CAP-X) tool was used to evaluate various types of innovative intersection designs. The CAP-X tool is based on the operational analysis using the critical lane method to evaluate selected types of innovative intersection designs. The following intersection control types were evaluated as part of the ICE Stage 1 evaluation for the study intersection.

- Traffic Signal
- Displaced Left Turn
- Partial Displaced Left Turn
- Median U-Turn
- Signalized Restricted Crossing U-Turn (R-CUT)
- 2 X 2 Roundabout
- Signalized Thru-Cut
- Quadrant Roadway
- Single Point Grade Separation

Each control type was compared operationally using a planning level volume-to-capacity (V/C) ratio based on the 2045 design year traffic volumes.

The FDOT expanded version of FHWA's Safety Performance of Intersection Control Evaluations (SPICE) tool was used to rank the control strategies selected for the CAP-X tool. It should be noted that the SPICE Tool does not include the Partial Displaced Left Turn, Partial Median U-Turn, Quadrant Roadway, and Single Point Grade Separation control strategies. As such, they were not evaluated in the SPICE analysis.

The SPICE tool ranks the safety performance of each alternative based upon a predicted number of total and fatal/injury crashes based upon the design year (2045) traffic volumes. A safety ranking of 1 denotes a lower predicted number of fatal/injury crashes while a higher ranking denotes a higher predicted number of fatal/injury crashes when compared to the other alternatives.

The SPICE tool also includes the Safe System for Intersections (SSI) analytical methodology. The Safe System is a human centered approach that involves the management and design of the road system such that impact energy on the human body is firstly avoided or secondly managed at tolerable levels by manipulating speed, mass, and crash angles to reduce crash injury severity.

Table 5-1 provides a comparison of the results from the ICE Stage 1 analysis. From a capacity standpoint, the highest ranked strategies include the Single Point Grade Separation, Quadrant Roadway, Partial Displaced Left Turn and Median U-Turn control strategies. As shown in the table above, the Signalized Thru-Cut, Signalized R-CUT and Roundabout control strategies have V/C ratios greater than 1 which indicates that these control strategies cannot accommodate the traffic demand for this intersection to meet the purpose and need for this project. Although the full Displaced Left Turn has a V/C ratio less than 1; however, the reverse curve and the railroad crossing on the west leg present challenging geometry and constraints for this control strategy.

Table 5-1 Summary of ICE Stage I Analysis									
Control Strategy	V/C Ratio		Ped Accom.	Bike Accom.	Predicted Crashes/Year		V/C Rank	Crash Prediction Rank	SSI Rank
	AM	PM			Total	Fatal/ Injury			
Single Point Grade Separation	0.62	0.51	3.10	3.67	N/A	N/A	1	N/A	N/A
Quadrant Roadway (S-E)	0.69	0.70	4.66	4.58	N/A	N/A	2	N/A	N/A
Partial Displaced Left Turn	0.70	0.70	2.95	3.29	N/A	N/A	3	N/A	N/A
Median U-Turn	0.82	0.78	3.00	4.58	8	3	4	1	1
Quadrant Roadway (N-E)	0.82	0.79	4.67	4.58	N/A	N/A	5	N/A	N/A
Displaced Left Turn	0.87	0.75	3.10	3.91	8	4	6	2	6
Traffic Signal	0.79	0.84	4.90	4.62	9	4	7	3	3
Signalized Thru-Cut	1.05	0.95	3.87	4.67	N/A	N/A	8	N/A	5
Signalized R-CUT	1.16	1.13	3.09	4.32	23	8	9	5	4
2 X 2 Roundabout	3.27	2.42	4.50	4.50	25	5	10	4	2

The SPICE tool does not provide safety analysis for the Partial Displaced Left Turn, Quadrant Roadway, and Single Point Grade Separation control strategies which were among the highest ranked from the capacity analysis. For the remaining strategies, the highest ranked from a crash prediction perspective include the Median U-turn followed by the Displaced Left Turn, and the Traffic Signal. Although the Displaced Left Turn strategy was ranked as number 2 based on crash prediction, it was ranked number 6 when considering the SSI approach.

In terms of multimodal accommodation, i.e., pedestrian and bicycle features, the highest ranked strategy is the at-grade traffic signal followed by the quadrant roadways control strategies. The partial displaced left turn and the full displaced left turn and grade separation control strategies are the least ranked for multimodal accommodations.

Based on the preliminary safety and capacity analysis evaluation as well as the multimodal accommodation, the following intersection control strategies are recommended to be further evaluated during the PD&E Study Alternatives Evaluation Process.

1. Single Point Grade Separation (US-1 over Aviation Blvd)
2. Single Point Grade Separation (Aviation Blvd over US-1)
3. Quadrant Roadway (S-E quadrant)
4. Quadrant Roadway (N-E quadrant)
5. Partial Displaced Left Turn
6. Median U-Turn
7. Traffic Signal

Both grade separation of US-1 over Aviation Blvd and Aviation Blvd over US-1 are recommended to be further evaluated. Currently there are no grade-separated crossings over the FEC railroad within the 2-mile radius. The proposed Brightline service along the FEC corridor will increase the number of trains resulting in additional delays and safety concerns at-grade crossings. Although grade separation of the minor roadway (Aviation Blvd over US-1) does not result in significant operational improvements, it will enhance safety and emergency response across the railroad tracks to the nearby Cleveland Clinic Indian River Hospital. The combination of these control strategies should also be evaluated to determine the optimal configuration for this intersection. The complete ICE Report for this PD&E Study with the corresponding justifications for the various control strategies are included in **Appendix F**.

5.2.2 Preliminary Alternatives Considered

Using the recommendations from the ICE analysis, eight preliminary alternatives were initially considered for this intersection design. They are listed and described below. The concepts for these preliminary alternatives are provided in **Appendix G**.

Alternative 1 - Conventional Intersection: This alternative expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. Access to Airport N. Drive is provided at grade. A shared use path would be along the south side of Aviation Blvd. US-1 is expanded to provide northbound dual left turns and southbound dual right turns.

Alternative 2 - Twin Intersections (One-way Pairs): This alternative expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Northbound US-1 shifts eastward to provide a one-way pair with twin intersections.

Alternative 3 - US-1 Overpass Alternative: This alternative expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. US-1 is expanded to include a four-lane overpass over Aviation Boulevard for the US-1 northbound and southbound through lane movement. The US-1 overpass is outside of the runway protection zone (RPZ) and below the 40:1 flight surface with 25.8 ft of clearance between the bridge profile and flight surface.

Alternative 4 - Aviation Boulevard Overpass (without railroad grade crossing): This alternative provides a four-lane overpass to move all Aviation Boulevard traffic over the railroad and US-1

without a signalized intersection and without an FEC railroad crossing. Access to Airport N. Drive is provided at grade. The Aviation Boulevard overpass embankment is within the RPZ and below the 40:1 flight surface with 17.8 ft of clearance between the bridge profile and flight surface. These alternative removes congestion on Aviation Boulevard within the RPZ because the traffic signal is located 1200 feet east of US-1. Aviation Boulevard would operate as free flow without stoppage within the RPZ.

Alternative 5 - Aviation Boulevard Underpass (without railroad grade crossing): This alternative depresses Aviation Boulevard under the FEC railroad tracks and US-1 with two eastbound and two westbound lanes. The existing railroad grade crossing is removed. Two new bridge structures would be required to carry the FEC railroad and for the US-1 roadway above the underpass. This alternative would have an open-cut section within the RPZ. Access to Airport N. Drive may require a reroute to the east to cross over the depressed roadway and connect back to Aviation Boulevard from the southside at a location west of the existing Airport N. Drive intersection. This alternative would operate in free flow traffic conditions within the RPZ.

Alternative 6 Aviation Boulevard Overpass (with railroad grade crossing): This alternative carries the east-west through lanes over US-1 and the FEC railroad tracks with an at grade railroad crossing for turning movements and a signalized intersection at US-1. The access to Airport N. Drive is modified to a westbound right turn, southbound right turn access with a U-turn below the overpass to access Airport N. Drive from the west. Evaluation to modify the overpass profile to match Alternative 6 may be obtained to provide full access to Airport N. Drive. The Aviation Boulevard overpass embankment is within the RPZ and below the 40:1 flight surface with 17.8 ft of clearance between the bridge profile and flight surface.

Alternative 7 - Displaced Left Turn (DLT): This alternative deflects the northbound US-1 left turn to the west side of the US-1 right of way via a signalized directional median and a two-lane, two-way parallel roadway that is separated from US-1 by a concrete separator. This two-lane parallel roadway also allows the eastbound to southbound right turn to utilize the DLT signalized intersection. This alternative is similar to Alternative 1 as it expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. Access to Airport N. Drive is provided at grade. A shared use path would be along the south side of Aviation Blvd.

Alternative 8 - Median U-Turn with Roundabout: This alternative incorporates a roundabout and quadrant road to provide for the northbound to westbound left turn and the eastbound to northbound left turn. The US-1 northbound left turns are directed east via a dual right turn to the roundabout to U-Turn and proceed west through the US-1 and Aviation Boulevard intersection. The Aviation Boulevard eastbound left turns are directed east through the US-1

intersection and use the roundabout to turn left onto quadrant road, then turn right at the US-1 and quadrant road intersection to complete the movement. The US-1 southbound left turns are moved to the directional signalized intersection at quadrant road. This alternative expands Aviation Boulevard and the railroad grade crossing to provide three eastbound lanes (1 right, 2 through), a median separator and two (2) westbound through lanes. Access to Airport N. Drive is provided at grade. A shared use path would be along the south side of Aviation Blvd.

5.3 REFINED BUILD ALTERNATIVES

Given the number of alternatives developed, the design team created a weighted evaluation matrix to narrow down and select alternatives to be analyzed further. (See **Appendix H** for the evaluation matrix). The matrix divides the alternatives into several categories and rates them on a one to four scale with one being the least desirable and four being the most desirable. The categories investigated include the ability of the alternative to satisfy the purpose and need of the PD&E Study, local agency preference, compatibility with existing roadway network, the degree of social-economic, cultural, environmental, contamination, and noise impacts, and construction cost. The following four alternatives were recommended to be advanced and evaluated for this study:

- Alternative 1: Conventional Intersection
- Alternative 2: Twin Intersections or One-way Pairs
- Alternative 7: Displaced Left Turn
- Alternative 8: Median U-turn with Roundabout

6.0 TRAVEL DEMAND FORECAST

6.1 TRAVEL DEMAND MODEL

The travel demand modeling and future year AADT forecasts for this study were developed under a separate study – *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The Treasure Coast Regional Planning Model Version 5.0 (TCRPM5) with base year 2015 and horizon year 2045 was used to estimate the future years daily forecasts for the study area. The 2045 model is based on the adopted year 2045 Regional Long-Range Transportation Plan (RLRTP) for Indian River, St. Lucie and Martin Counties and is recognized by both FDOT District Four, as well as the Indian River County MPO as an acceptable travel demand forecasting tool. No further modifications or validation of the travel demand model was done as part of this PD&E Study. However, the future daily volumes and travel patterns were checked for reasonableness.

6.2 PROJECT TRAFFIC DEVELOPMENT

6.2.1 Future Annual Average Daily Traffic (AADT) Volumes

The AADT forecast volumes for this PD&E Study was developed under a separate study – *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The future year AADT volumes were obtained by applying an areawide compound rate of 2.0% to the existing 2021 AADT volumes. This growth rate was calculated by averaging each of the rates obtained from each of the forecasting methods identified in **Section 2.4**. **Figure 4-1** shows the existing AADT volumes obtained for the various roadway segments within the study area.

6.2.2 Future Intersection Turning Movement Volumes

The development of future year turning movement volumes (TMV) for the study intersections were based on the existing turning movement percentages obtained from the field. TMTOOL was used to forecast the turning movement volumes for the study intersections for the AM and PM peak hours using the traffic factors and forecasted AADTs. Projected turns were smoothed and balanced to within a +/- 7 percent tolerance level. The TMTOOL spreadsheets are provided in the Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support, dated November 2, 2021. The 2025 opening year and 2045 design year future turning movement volumes for the AM and PM peak hours are summarized in **Figure 6-3** and **Figure 6-4**.

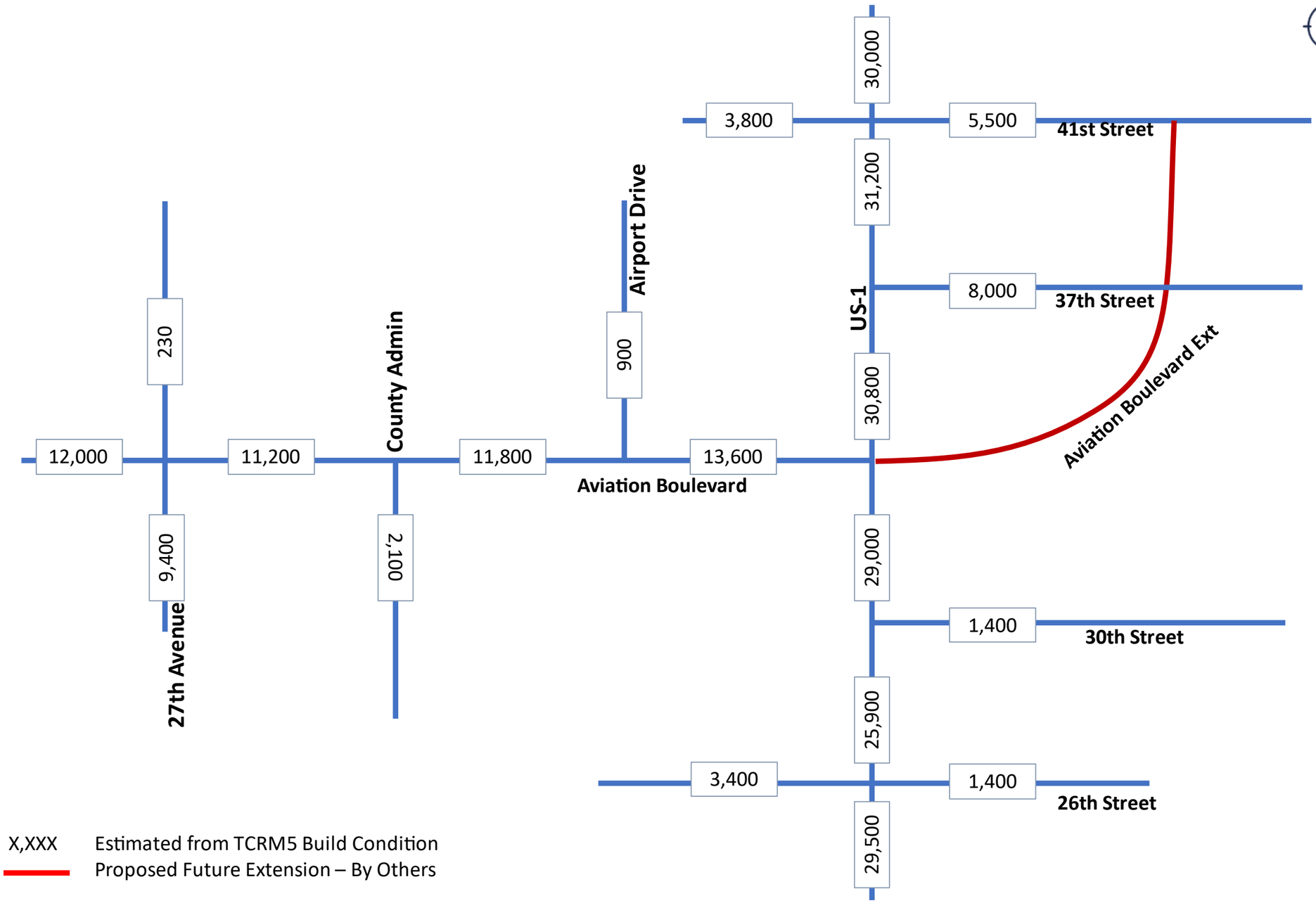


Figure 6-1 2025 Future Annual Average Daily Traffic (AADT) Volumes

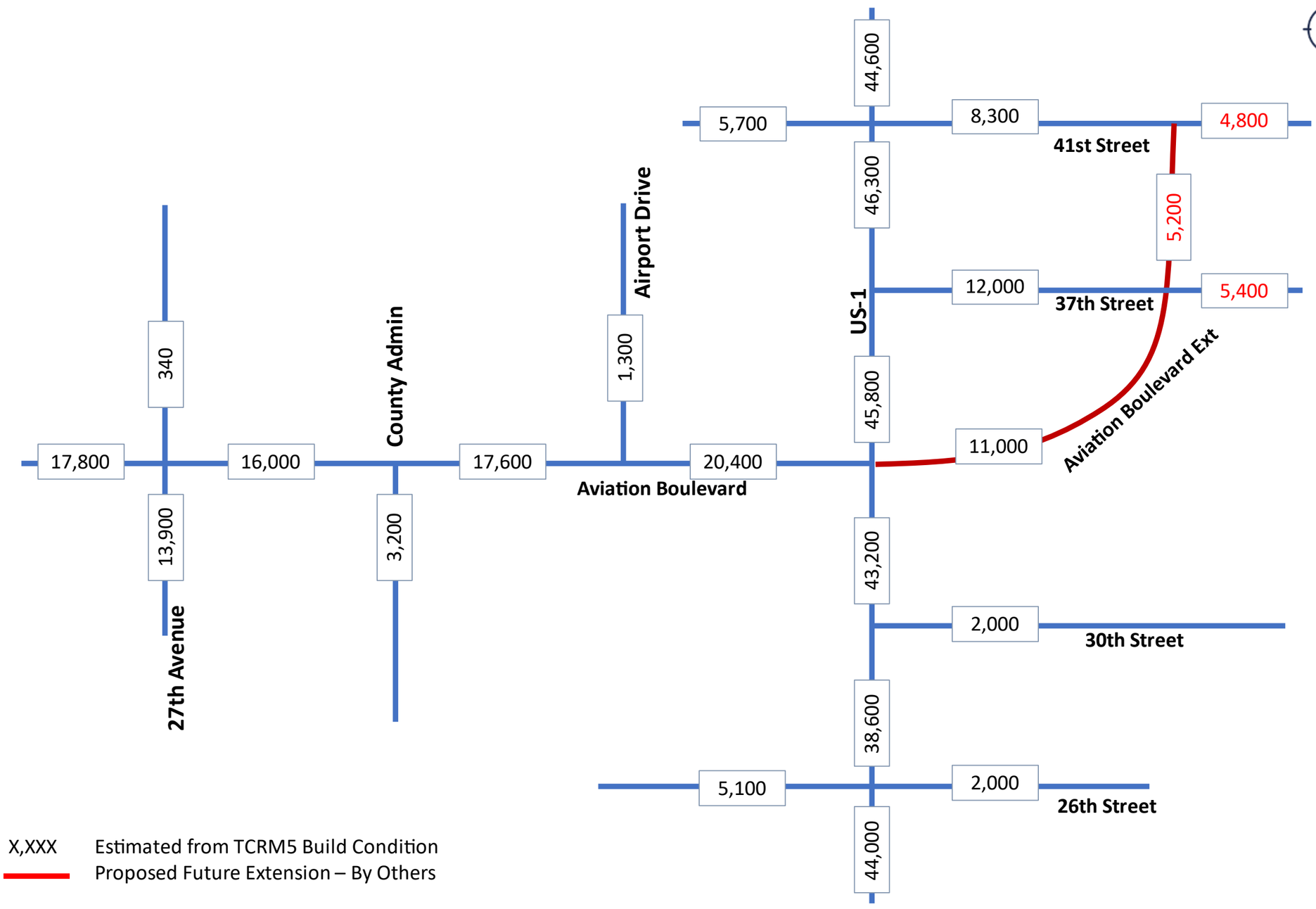


Figure 6-2 2045 Future Annual Average Daily Traffic (AADT) Volumes

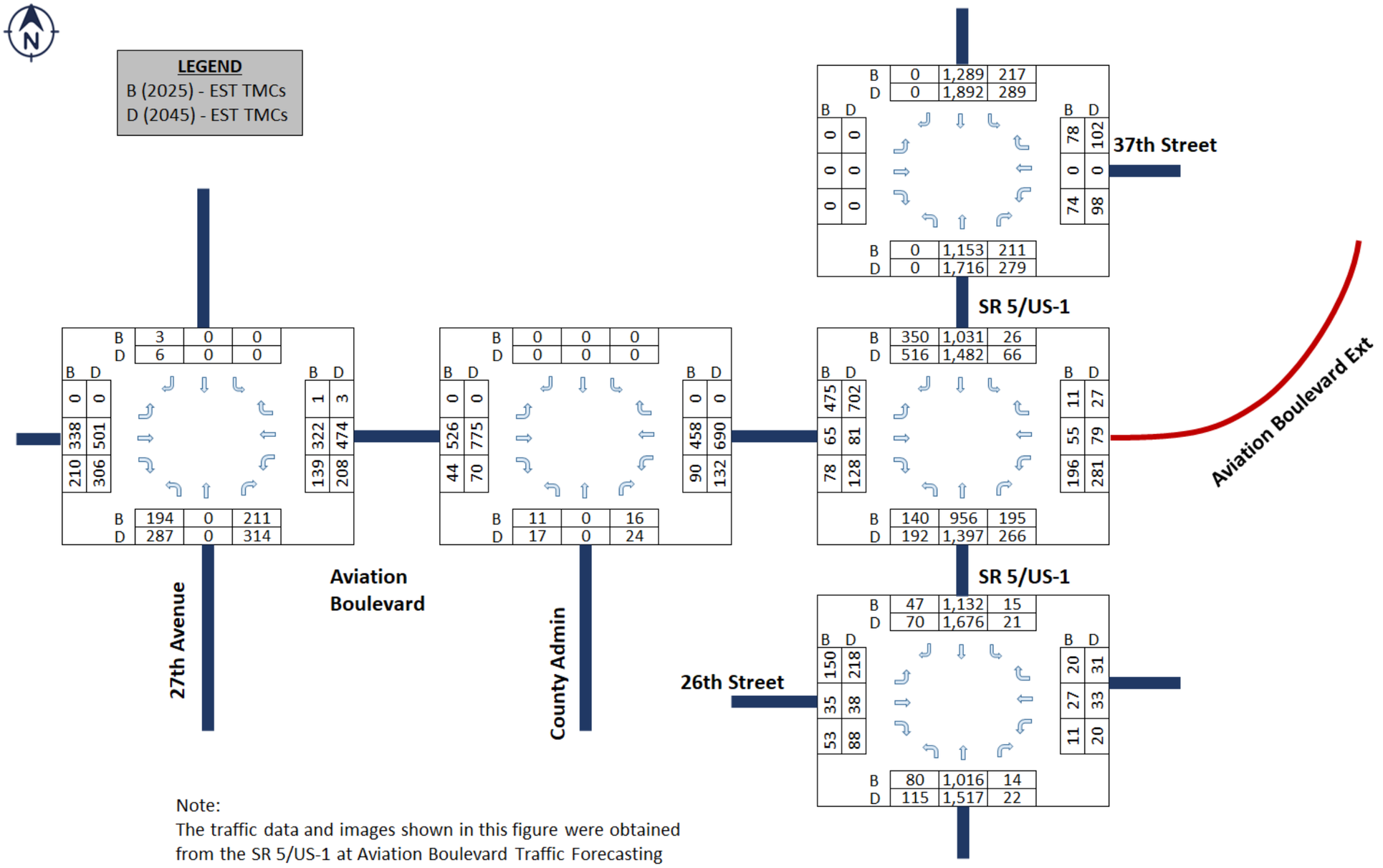
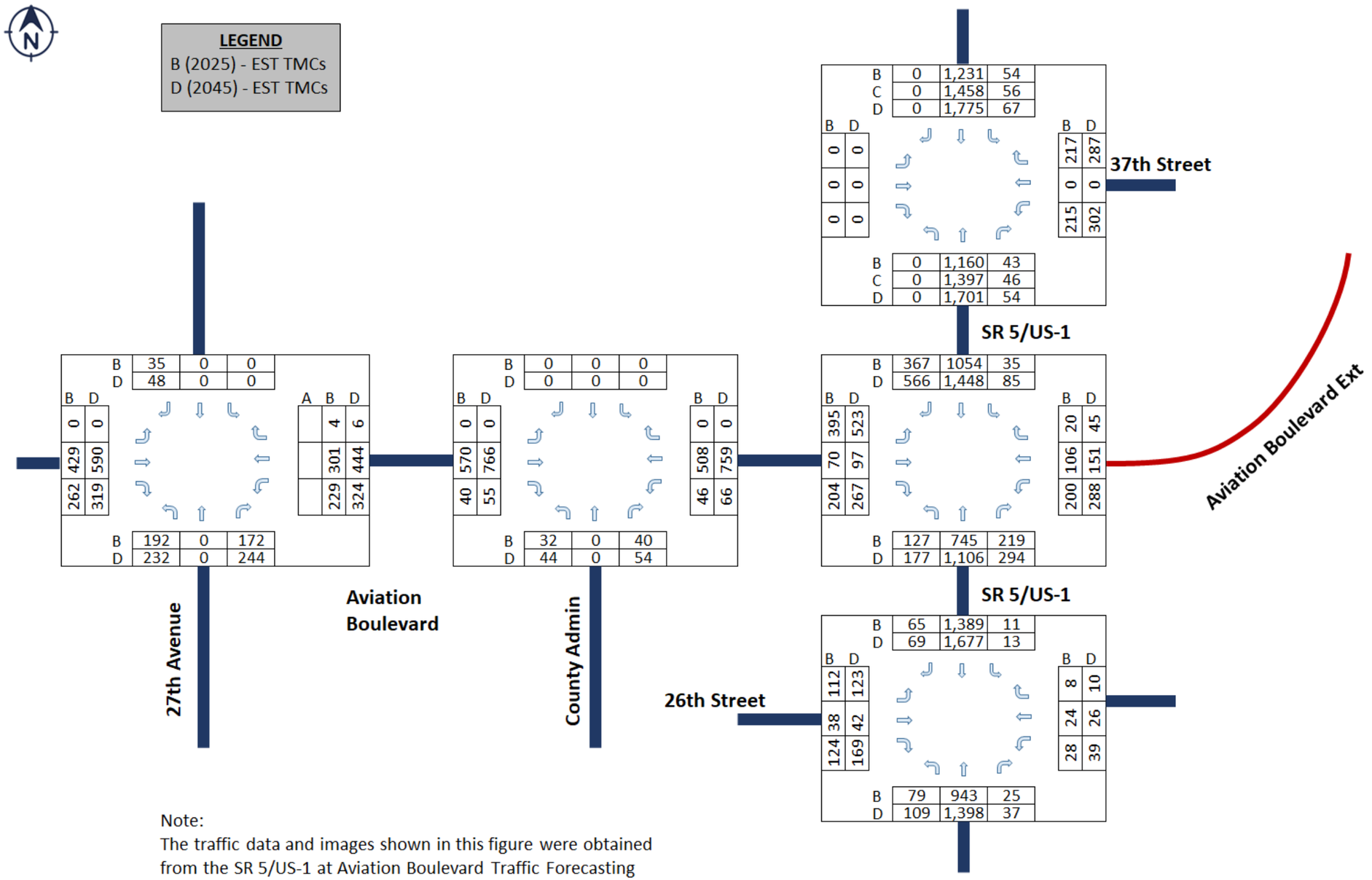


Figure 6-3 Future Intersection Turning Movement Volumes – AM Peak Period



Note:
The traffic data and images shown in this figure were obtained from the SR 5/US-1 at Aviation Boulevard Traffic Forecasting

Figure 6-4 Future Intersection Turning Movement Volumes – PM Peak Period

7.0 FUTURE TRAFFIC OPERATIONAL ANALYSIS

Traffic operational analysis to determine future conditions for the No-Build and Build Alternatives at the study intersections was performed using the future build intersection turning movement volumes obtained from the traffic forecast report. The future operational analysis was performed for the 2025 opening year and 2045 design year using the SYNCHRO 11 Traffic Analysis Software for intersection analysis. Both AM and PM peak hour evaluations were performed to determine delays and Level of Service (LOS). The LOS and delays were calculated using the HCM 6 methodology where feasible. However, where the HCM 6 methodology did not support the intersection characteristics, the HCM 2000 methodology was applied. The roundabout analysis was performed using the roundabout module in the HCS 7 traffic analysis software.

A queuing analysis for the No-Build and Build Alternatives was performed for the 2045 design year for comparison among the alternatives using SYNCHRO 11. For signalized intersections where the HCM 6 methodology was applicable, the 95th percentile vehicular queue in the unit of vehicles per lane for the left-turn and right-turn movements were obtained. A vehicle length of 25-ft was then used to estimate the queue lengths in feet. For signalized intersections where the HCM 6 methodology is not applicable, the 95th percentile queues lengths in feet as reported by SYNCHRO 11 software was utilized.

As part of the alternatives development process, additional storage improvements were evaluated for the Build Alternatives at the project intersection of SR 5/US-1 and Aviation Blvd were feasible while taking into consideration various constraints such as location of preceding left turn storage, location of adjacent intersection, driveways, utilities and right of way. The proposed storage lengths were estimated based on the requirements of FDM Exhibit 212-1. For the remaining intersections the existing storage lengths were maintained.

7.1 NO-BUILD ALTERNATIVE

The No-Build Alternative evaluated as part of this PD&E Study assumes that the Aviation Blvd Extension project which extends Aviation Boulevard from the SR 5/US-1/Aviation Boulevard intersection to 36th Street has been completed. The Aviation Blvd Extension will consist of two 12-foot lanes, 7-foot bike lanes, and intersection improvements at SR 5/US-1 and will serve as an alternative route to improve existing and future access to the Cleveland Clinic Indian River Hospital and provide relief to 37th Street, which is nearing vehicular capacity.

7.1.1 Signalized Intersection Level of Service

Table 7-1 through **Table 7-4** show the Future No-Build conditions LOS analysis results for the signalized intersections within the traffic study area. The existing signal timings were optimized for the No-Build analysis to account for traffic growth and demand.

Based on the analysis results, most of the study intersections will operate at LOS D or better in the 2025 opening year except for the SR 5/US-1 and Aviation Blvd intersection that will operate at LOS E during the AM Peak Period and LOS F during the PM peak period. In addition, 6 intersection approaches will operate at LOS F and 7 intersection approaches will operate at LOS E during the AM and PM peak periods.

For the 2045 design year, most of the study intersections will operate at LOS D or better except for the SR 5/US-1 and Aviation Blvd intersection that will operate at LOS F during both the AM and PM peak period. In addition, 4 intersection approaches will operate at LOS F and 3 intersection approaches will operate at LOS E during the AM peak period while 4 intersection approaches will operate at LOS F and 4 intersection approaches will operate at LOS E during the PM peak period.

The detailed results of the 2025 opening year and 2045 design year No-Build future conditions analysis for the signalized intersections within the project limits are provided in **Appendix I**.

Table 7-1 2025 Future No Build Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	107.5	F	92.6	F	24.5	C	83.9	F	67.9	E
2	SR 5/US-1 & 26th Street	72.6	E	77.7	E	7.3	A	2.9	A	13.4	B
3	SR 5/US-1 & 37th Street	-	-	66.6	E	7.9	A	4.5	A	9.1	A
4	27th Avenue & Aviation Blvd	14.1	B	7.9	A	-	-	46.2	D	16.2	B
5	County Admin & Aviation Blvd	12.6	B	5.5	A	18.6	B	-	-	9.4	A

Table 7-2 2025 Future No Build Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	110.0	F	93.9	F	54.1	D	159.5	F	111.6	F
2	SR 5/US-1 & 26th Street	63.1	E	79.4	E	8.8	A	15.4	B	19.1	B
3	SR 5/US-1 & 37th Street	-	-	61.9	E	12.3	B	7.9	A	17.7	B
4	27th Avenue & Aviation Blvd	19.3	B	10.6	B	-	-	57.9	E	23.2	C
5	County Admin & Aviation Blvd	12.5	B	5.7	A	18.5	B	-	-	9.8	A

Table 7-3 2045 Future No Build Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	287.8	F	217.2	F	113.0	F	281.0	F	219.0	F
2	SR 5/US-1 & 26th Street	71.2	E	78.3	E	13.5	B	32.5	C	28.7	C
3	SR 5/US-1 & 37th Street	-	-	58.6	E	23.2	C	15.5	B	21.0	C
4	27th Avenue & Aviation Blvd	24.3	C	12.8	B	-	-	44.2	D	24.4	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B

Table 7-4 2045 Future No Build Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	236.9	F	272.7	F	151.1	F	378.3	F	272.1	F
2	SR 5/US-1 & 26th Street	67.9	E	79.6	E	16.3	B	23.7	C	25.9	C
3	SR 5/US-1 & 37th Street	-	-	63.3	E	20.0	C	15.2	B	24.0	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-	-	10.5	B

7.1.2 Signalized Intersection Queue Analysis

Table 7-5 shows the queue analysis results for the 2045 No-Build conditions. Based on the analysis, 9 out of the 18 (50%) locations with existing turn storages have deficient storage lengths. The queue analysis also indicated that eastbound left-turn at the SR 5/US-1 and Aviation Blvd intersection experiences queue spillovers during the AM and PM peak periods by 193% to 232%. In addition, the NB left turn also exceeds the existing storage length by 13%-23% during the AM and PM peak periods. The detailed queue analysis results are provided in **Appendix I**.

Table 7-5 2045 No Build Intersection Queue Length

No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Available Storage (ft)	Storage Deficiency
1	SR 5/US-1 & Aviation Blvd.	EB	L	565	418	565	340	Yes
		NB	L	175	160	175	370	Yes
		SB	L	63	423	423	170	No
2	SR 5/US-1 & 26th Street	EB	L	225	138	225	180	Yes
			R	170	295	295	50	Yes
		WB	R	60	20	60	110	No
		NB	L	143	138	143	200	No
		SB	L	18	13	18	570	No
3	SR 5/US-1 & 37th Street	WB	L	88	230	230	200	Yes
		WB	R	315	803	803	200	Yes
		SB	L	498	63	498	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	95	240	240	260	No
		NB	L	303	333	333	200	Yes
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	318	13	318	270	Yes
		WB	L	35	15	35	300	No
		NB	L	10	28	28	270	No
			R	38	3	38	220	No

7.2 BUILD ALTERNATIVE 1 – CONVENTIONAL INTERSECTION

Build Alternative 1 consists of a conventional, at-grade intersection with a shared used path to enhance multimodal access. This alternative expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. Access to Airport N. Drive is provided at grade. A shared use path would be along the south side of Aviation Blvd. US-1 is expanded to provide northbound dual left turns and southbound dual right turns.

7.2.1 Signalized Intersection Level of Service

Table 7-6 through **Table 7-9** summarize the 2025 opening year and 2045 design year LOS analysis results for the study intersections under Build Alternative 1.

Based on the analysis results, all the study intersections will operate at LOS C or better in the 2025 opening year during both the AM and PM peak periods. However, 5 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 4 intersection approaches will operate at LOS E and PM peak period.

For the 2045 design year, all the study intersections will operate at LOS D or better during both the AM and PM peak periods. However, 5 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 4 intersection approaches will operate at LOS E during the PM peak period.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year and LOS D during the 2045 design year for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS E or better except for the northbound left turn movement which operates at LOS F during the 2045 PM peak period.

The detailed results of the 2025 opening year and 2045 design year Build Alternative 1 future conditions analysis for the signalized intersections within the project limits are provided in **Appendix J**.

Table 7-6 2025 Future Build Alternative 1 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	66.2	E	64.7	E	21.5	C	17.8	B	31.0	C
2	SR 5/US-1 & 26th Street	72.6	E	77.7	E	7.5	A	12.9	B	18.0	B
3	SR 5/US-1 & 37th Street	-	-	66.6	E	8.3	A	4.5	A	9.3	A
4	27th Avenue & Aviation Blvd	14.1	B	7.9	A	-	-	46.2	D	16.2	B
5	County Admin & Aviation Blvd	12.6	B	5.5	A	18.6	B	-	-	9.4	A

Table 7-7 2025 Future Build Alternative 1 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	65.1	E	54.8	D	25.8	C	23.0	C	34.7	C
2	SR 5/US-1 & 26th Street	69.8	E	82.0	F	8.9	A	17.5	B	21.0	C
3	SR 5/US-1 & 37th Street	-	-	61.9	E	12.9	B	7.9	A	18.0	B
4	27th Avenue & Aviation Blvd	19.3	B	10.6	B	-	-	57.9	E	23.2	C
5	County Admin & Aviation Blvd	12.5	B	5.7	A	18.5	B	-	-	9.8	A

Table 7-8 2045 Future Build Alternative 1 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	67.4	E	62.0	E	33.9	C	37.7	D	43.3	D
2	SR 5/US-1 & 26th Street	71.2	E	78.3	E	12.7	B	18.4	B	21.8	C
3	SR 5/US-1 & 37th Street	-	-	58.6	E	26.5	C	15.5	B	22.5	C
4	27th Avenue & Aviation Blvd	23.4	C	12.8	B	-	-	44.2	D	24.4	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B

Table 7-9 2045 Future Build Alternative 1 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	67.7	E	53.1	D	35.8	D	40.5	D	45.0	D
2	SR 5/US-1 & 26th Street	67.9	E	82.0	F	16.3	B	25.1	C	26.6	C
3	SR 5/US-1 & 37th Street	-	-	63.3	E	22.9	C	15.2	B	25.2	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-	-	10.5	B

7.2.2 Signalized Intersection Queue Analysis

Table 7-10 shows the queue lengths for the design year 2045 under Build Alternative 1. Based on the analysis, 6 out of the 23 (26%) locations with existing turn storages have deficient storage lengths. All the deficient locations are at signalized intersections where no improvements are being made as part of this PD&E Study. For the project study intersection at SR 5/US-1 and Aviation Blvd., the existing storage lengths will be expanded to accommodate future queues. The detailed queue analysis results are provided in **Appendix J**.

Table 7-10 2045 Build Alternative 1 Intersection Queue Length

No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Available Storage (ft)	Storage Deficiency
1	SR 5/US-1 & Aviation Blvd.	EB	L	543	408	543	700	No
			R	203	433	433	590	No
		WB	L	405	375	405	560	No
			R	45	70	70	230	No
		NB	L	175	180	180	370	No
			R	155	200	200	390	No
		SB	L	60	80	80	270	No
			R	145	195	195	380	No
2	SR 5/US-1 & 26th Street	EB	L	220	138	220	180	Yes
			R	165	295	295	50	Yes
		WB	R	60	20	60	110	No
		NB	L	143	138	143	200	No
		SB	L	18	13	18	570	No
3	SR 5/US-1 & 37th Street	WB	L	88	230	230	200	Yes
		WB	R	315	803	803	200	Yes
		SB	L	498	63	498	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	95	240	240	260	No
		NB	L	303	333	333	200	Yes
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	18	13	18	270	No
		WB	L	35	15	35	300	No
		NB	L	10	28	28	270	No
			R	38	3	38	220	No

7.3 BUILD ALTERNATIVE 2 – ONE-WAY PAIR

Build Alternative 2 introduces a one-way pair for US-1 with the southbound direction remaining in the original pavement footprint and the northbound splitting further east to form a second intersection with Aviation Blvd. This alternative expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Due to the curvature of the alignment leading into the bifurcation, the main canal bridge will have to be reconstructed into two bridges.

7.3.1 Signalized Intersection Level of Service

Table 7-11 through **Table 7-14** summarize the 2025 opening year and 2045 design year LOS analysis results for the study intersections under Build Alternative 2.

Based on the analysis results, all the study intersections will operate at LOS C or better in the 2025 opening year during both the AM and PM peak periods. However, 3 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 3 intersection approaches will operate at LOS E during the PM peak period.

For the 2045 design year, all the study intersections will operate at LOS D or better during both the AM and PM peak periods. However, 3 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 3 intersection approaches will operate at LOS E during the PM peak period.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year and LOS D during the 2045 design year for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound right turn movement at the southbound intersection and the eastbound left turn movement at the northbound intersection which operates at LOS E during the 2045 PM peak period.

The detailed results of the 2025 opening year and 2045 design year Build Alternative 2 future conditions analysis for the signalized intersections within the project limits are provided in **Appendix K**.

Table 7-11 2025 Future Build Alternative 2 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 SB & Aviation Blvd.	48.7	D	27.1	C	-	-	15.3	B	25.8	C
2	SR 5/US-1 & 26th Street	72.6	E	77.7	E	7.5	A	13.2	B	18.2	B
3	SR 5/US-1 & 37th Street	-	-	68.1	E	8.6	A	4.5	A	9.5	A
4	27th Avenue & Aviation Blvd	14.7	B	8.2	A	-	-	46.3	D	16.6	B
5	County Admin & Aviation Blvd	12.6	B	5.5	A	18.6	B	-	-	9.4	A
6	SR 5/US-1 NB & Aviation Blvd.	43.6	D	54.3	D	16.2	B	-	-	28.2	C

Table 7-12 2025 Future Build Alternative 2 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 SB & Aviation Blvd.	47.3	D	21.5	C	-	-	16.9	B	25.6	C
2	SR 5/US-1 & 26th Street	69.8	E	82.0	F	8.9	A	18.1	B	21.3	C
3	SR 5/US-1 & 37th Street	-	-	61.9	E	13.2	B	7.9	A	18.1	B
4	27th Avenue & Aviation Blvd	19.3	B	10.6	B	-	-	57.9	E	23.2	C
5	County Admin & Aviation Blvd	12.5	B	5.7	A	18.5	B	-	-	9.8	A
6	SR 5/US-1 NB & Aviation Blvd.	42.3	D	51.7	D	15.3	B	-	-	28.5	C

Table 7-13 2045 Future Build Alternative 2 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 SB & Aviation Blvd.	49.1	D	29.9	C	-	-	33.1	C	36.7	D
2	SR 5/US-1 & 26th Street	73.3	E	78.3	E	12.8	B	22.4	C	23.9	C
3	SR 5/US-1 & 37th Street	-	-	58.6	E	33.5	C	15.5	B	25.7	C
4	27th Avenue & Aviation Blvd	24.0	C	13.3	B	-	-	44.3	D	25.0	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B
6	SR 5/US-1 NB & Aviation Blvd.	48.7	D	52.6	D	37.3	D	-	-	42.3	D

Table 7-14 2045 Future Build Alternative 2 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 SB & Aviation Blvd.	49.7	D	29.7	C	-	-	33.1	C	36.6	D
2	SR 5/US-1 & 26th Street	70.9	E	82.0	F	16.4	B	30.4	C	29.4	C
3	SR 5/US-1 & 37th Street	-	-	63.3	E	25.0	C	15.2	B	26.1	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-	-	10.5	B
6	SR 5/US-1 NB & Aviation Blvd.	46.8	D	52.7	D	28.3	C	-	-	37.5	D

7.3.2 Signalized Intersection Queue Analysis

Table 7-15 shows the queue lengths for the design year 2045 under Build Alternative 2. Based on the analysis, 7 out of the 23 (30%) locations with existing turn storages have deficient storage lengths. All the deficient locations are at signalized intersections where no improvements are being made as part of this PD&E Study. For the project study intersections at SR 5/US-1 and Aviation Blvd., the proposed storage lengths will be designed to accommodate the future queues. The detailed queue analysis results are provided in **Appendix K**.

Table 7-15 2045 Build Alternative 2 Intersection Queue Length

No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Available Storage (ft)	Storage Deficiency
1	SR 5/US-1 SB & Aviation Blvd.	EB	R	173	358	358	520	No
		WB	L	268	275	275	430	No
		SB	L	45	63	63	250	No
			R	440	530	530	720	No
2	SR 5/US-1 & 26th Street	EB	L	225	145	225	180	Yes
			R	170	303	303	50	Yes
		WB	R	60	20	60	110	No
		NB	L	143	138	143	200	No
		SB	L	20	15	20	570	No
3	SR 5/US-1 & 37th Street	WB	L	88	230	230	200	Yes
			R	315	803	803	200	Yes
		SB	L	498	63	498	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	98	240	240	260	No
		NB	L	305	333	333	200	Yes
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	318	13	318	270	Yes
		WB	L	35	15	35	300	No
		NB	L	10	28	28	270	No
			R	38	3	38	220	No
6	SR 5/US-1 NB & Aviation Blvd.	EB	L	403	330	403	560	No
		WB	R	30	48	48	210	No
		NB	L	165	153	165	350	No
			R	233	258	258	450	No

7.4 BUILD ALTERNATIVE 7 – DISPLACED LEFT TURN

Build Alternative 7 consists of a conventional, at-grade intersection with an added deflected left turn for the northbound US-1 movement to the west side of the US-1 right of way via a signalized directional median and a two-lane, two-way parallel roadway that is separated from US-1 by a concrete separator. This two-lane parallel roadway also allows the eastbound to southbound right turn to utilize the Displaced Left Turn signalized intersection. This alternative is similar to Alternative 1 as it expands Aviation Boulevard and the railroad grade crossing to provide four eastbound lanes (1 right, 1 through, 2 lefts), a median separator and two (2) westbound through lanes. Access to Airport North Drive is provided at grade. A shared use path would be along the south side of Aviation Blvd.

7.4.1 Signalized Intersection Level of Service

Table 7-16 through **Table 7-19** summarize the 2025 opening year and 2045 design year LOS analysis results for the study intersections under Build Alternative 7.

Based on the analysis results, all the study intersections will operate at LOS C or better in the 2025 opening year during both the AM and PM peak periods. However, 5 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 5 intersection approaches will operate at LOS E during the PM peak period.

For the 2045 design year, all the study intersections will operate at LOS C or better during both the AM and PM peak periods. However, 5 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 5 intersection approaches will operate at LOS E during the PM peak period.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will also operate at LOS C for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the westbound approach, left turn and shared thru-right movements as well as the right turn movement at the displaced left turn cross over which operates at LOS E during the 2025 opening year and 2045 design year for both AM and PM peak periods.

The detailed results of the 2025 opening year and 2045 design year Build Alternative 7 future conditions analysis for the signalized intersections within the project limits are provided in **Appendix L**.

Table 7-16 2025 Future Build Alternative 7 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	15.7	B	57.0	E	25.1	C	17.9	B	23.1	C
2	SR 5/US-1 & 26th Street	72.6	E	77.7	E	7.5	A	13.1	B	18.1	B
3	SR 5/US-1 & 37th Street	-	-	66.6	E	8.3	A	4.5	A	9.3	A
4	27th Avenue & Aviation Blvd	14.7	B	8.2	A	-	-	46.3	D	16.6	B
5	County Admin & Aviation Blvd	12.6	B	5.5	A	18.6	B	-	-	9.4	A
6	SR 5/US-1 & DLT	65.1	E	-	-	2.2	A	8.8	A	7.2	A
7	DLT & Aviation Blvd.	27.0	C	1.6	A	17.1	B	-	-	17.0	B

Table 7-17 2025 Future Build Alternative 7 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	18.2	C	55.7	E	20.8	C	16.5	B	22.0	C
2	SR 5/US-1 & 26th Street	69.8	E	82.0	F	8.9	A	17.7	B	21.1	C
3	SR 5/US-1 & 37th Street	-	-	61.9	E	13.0	B	7.9	A	18.0	B
4	27th Avenue & Aviation Blvd	19.3	B	10.6	B	-	-	57.9	E	23.2	C
5	County Admin & Aviation Blvd	12.5	B	5.7	A	18.5	B	-	-	9.8	A
6	SR 5/US-1 & DLT	63.6	E	-	-	2.2	A	11.2	B	11.5	B
7	DLT & Aviation Blvd.	22.7	C	1.7	A	15.4	B	-	-	14.1	B

Table 7-18 2045 Future Build Alternative 7 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	44.2	D	69.9	E	31.1	C	21.1	C	32.0	C
2	SR 5/US-1 & 26th Street	73.3	E	78.3	E	12.8	B	20.6	C	23.1	C
3	SR 5/US-1 & 37th Street	-	-	58.6	E	25.4	C	15.5	B	22.0	C
4	27th Avenue & Aviation Blvd	24.0	C	13.3	B	-	-	44.3	D	25.0	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B
6	SR 5/US-1 & DLT	65.3	E	-	-	6.8	A	14.5	B	12.4	B
7	DLT & Aviation Blvd.	30.9	C	1.8	A	8.6	A	-	-	18.2	B

Table 7-19 2045 Future Build Alternative 7 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	24.5	C	57.7	E	26.3	C	26.3	C	28.2	C
2	SR 5/US-1 & 26th Street	67.9	E	82.0	F	16.3	B	27.1	C	27.5	C
3	SR 5/US-1 & 37th Street	-	-	63.3	E	22.5	C	15.2	B	25.0	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-	-	10.5	B
6	SR 5/US-1 & DLT	73.1	E	-	-	8.9	A	13.8	A	16.1	B
7	DLT & Aviation Blvd.	21.9	C	1.9	A	9.9	A	-	-	12.6	B

7.4.2 Signalized Intersection Queue Analysis

Table 7-20 shows the queue lengths for the design year 2045 under Build Alternative 7. Based on the analysis, 6 out of the 24 (25%) locations with existing turn storages have deficient storage lengths. All the deficient locations are at signalized intersections where no improvements are being made as part of this PD&E Study. The proposed storage lengths for the project study intersection at SR 5/US-1 and Aviation Blvd. as well as the new intersections for the displaced left turn will be designed to accommodate future queues. The detailed queue analysis results are provided in **Appendix L**.

Table 7-20 2045 Build Alternative 7 Intersection Queue Length

No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Available Storage (ft)	Storage Deficiency
1	SR 5/US-1 & Aviation Blvd.	EB	L	497	338	497	660	No
		WB	L	307	284	307	470	No
		NB	R	22	19	22	180	No
		SB	L	57	69	69	260	No
			R	11	24	24	210	No
2	SR 5/US-1 & 26th Street	EB	L	225	138	225	180	Yes
			R	170	295	295	50	Yes
		WB	R	60	20	60	110	No
		NB	L	143	138	143	200	No
		SB	L	20	13	20	570	No
3	SR 5/US-1 & 37th Street	WB	L	88	230	230	200	Yes
		WB	R	315	803	803	200	Yes
		SB	L	498	63	498	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	98	240	240	260	No
		NB	L	305	333	333	200	Yes
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	18	13	18	270	No
		WB	L	35	15	35	300	No
		NB	L	10	28	28	270	No
			R	38	3	38	220	No
6	SR 5/US-1 & DLT Crossover	EB	R	125	4650	4650	4810	No
		NB	L	4125	4375	4375	4560	No
7	Aviation Blvd. & DLT	EB	R	0	0	0	160	No
		NB	L	1325	1175	1325	1510	No

7.5 BUILD ALTERNATIVE 8 – MEDIAN U-TURN ROUNDABOUT

This alternative incorporates a roundabout and quadrant road to provide for the northbound to westbound left turn and the eastbound to northbound left turn. The US-1 northbound left turns are directed east via a dual right turn to the roundabout to U-Turn and proceed west through the US-1 and Aviation Boulevard intersection. The Aviation Boulevard eastbound left turns are directed east through the US-1 intersection and use the roundabout to turn left onto quadrant road, then turn right at the US-1 and quadrant road intersection to complete the movement. The US-1 southbound left turns are moved to the directional signalized intersection at quadrant road. A shared use path would be along the south side of Aviation Blvd.

7.5.1 Signalized Intersection Level of Service

Table 7-21 to Table 7-24 summarize the 2025 opening year and 2045 design year LOS analysis results for the study intersections under Build Alternative 8.

Based on the analysis results, all the study intersections will operate at LOS C or better in the 2025 opening year during both the AM and PM peak periods. However, 6 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 5 intersection approaches will operate at LOS E during the PM peak period.

For the 2045 design year, all the study intersections will operate at LOS D or better during both the AM and PM peak periods. However, 7 intersection approaches will operate at LOS E during the AM peak period while 1 intersection approach will operate at LOS F and 5 intersection approaches will operate at LOS E during the PM peak period.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will operate at LOS D and LOS C for the AM and PM peak periods respectively. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound and westbound approaches as well as the eastbound thru and westbound left turn movements during the AM peak period and the eastbound approach, thru and right turn movements as well as the westbound left turn movement which operates at LOS E during the PM peak period for both 2025 and 2045.

The detailed results of the 2025 opening year and 2045 design year Build Alternative 8 future conditions analysis for the signalized intersections within the project limits are provided in **Appendix M**.

Table 7-21 2025 Future Build Alternative 8 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	61.6	E	55.9	E	24.4	C	16.9	B	31.2	C
2	SR 5/US-1 & 26th Street	72.6	E	77.7	E	7.3	A	4.0	A	13.9	B
3	SR 5/US-1 & 37th Street	-	-	66.6	E	1.3	A	3.5	A	5.7	A
4	27th Avenue & Aviation Blvd	14.7	B	8.2	A	-	-	46.3	D	16.6	B
5	County Admin & Aviation Blvd	12.6	B	5.5	A	18.6	B	-	-	9.4	A
6	SR 5/US-1 SB & Access Road	-	-	68.1	E	10.7	B	8.6	B	19.5	B
7	Aviation Blvd Ext. & Roundabout	5.8	A	10.9	B	-	-	4.5	A	6.9	A

Table 7-22 2025 Future Build Alternative 8 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	61.9	E	52.4	D	12.0	B	15.1	B	27.3	C
2	SR 5/US-1 & 26th Street	69.8	E	82.0	F	8.9	A	17.5	B	21.0	C
3	SR 5/US-1 & 37th Street	-	-	61.9	E	13.1	B	7.9	A	18.0	B
4	27th Avenue & Aviation Blvd	19.3	B	10.6	B	-	-	57.9	E	23.2	C
5	County Admin & Aviation Blvd	12.5	B	5.7	A	18.5	B	-	-	9.8	A
6	SR 5/US-1 SB & Access Road	-	-	55.8	E	0.3	A	6.6	A	12.6	B
7	Aviation Blvd Ext. & Roundabout	5.6	A	11.0	B	-	-	4.8	A	7.1	A

Table 7-23 2045 Future Build Alternative 8 Intersections LOS - AM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	64.3	E	58.1	E	28.7	C	31.4	C	38.9	D
2	SR 5/US-1 & 26th Street	73.3	E	78.3	E	12.8	B	19.8	B	22.7	C
3	SR 5/US-1 & 37th Street	-	-	58.6	E	30.4	C	15.5	B	24.3	C
4	27th Avenue & Aviation Blvd	24.0	C	13.3	B	-	-	44.3	D	25.0	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B
6	SR 5/US-1 SB & Access Road	-	-	72.5	E	19.0	B	20.1	B	28.8	C
7	Aviation Blvd Ext. & Roundabout	8.2	A	35.9	E	-	-	6.0	A	14.4	B

Table 7-24 2045 Future Build Alternative 8 Intersections LOS - PM Peak Period											
No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/ LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US-1 & Aviation Blvd.	65.3	E	52.6	D	19.1	B	24.8	C	33.5	C
2	SR 5/US-1 & 26th Street	67.9	E	82.0	F	16.3	B	26.8	C	27.4	C
3	SR 5/US-1 & 37th Street	-	-	63.3	E	24.2	C	15.2	B	25.7	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-	-	10.5	B
6	SR 5/US-1 & Access Road	-	-	55.4	E	0.6	A	14.7	B	16.8	B
7	Aviation Blvd Ext. & Roundabout	7.5	A	31.5	D	-	-	6.9	A	14.4	B

7.5.2 Signalized Intersection Queue Analysis

Table 7-25 shows the queue lengths for the design year 2045 under Build Alternative 8 Based on the analysis, 6 out of the 24 (25%) locations with existing turn storages have deficient storage lengths. All the deficient locations are at signalized intersections where no improvements are being made as part of this PD&E Study. The proposed storage lengths for the project study intersection at SR 5/US-1 and Aviation Blvd. as well as the new intersections for the median U-turn and quadrant roadway will be designed to accommodate future queues. The detailed queue analysis results are provided in **Appendix M**.

Table 7-25 2045 Build Alternative 8 Intersection Queue Length

No.	Intersection	Approach		AM	PM	Max Queue Length (ft)	Available Storage (ft)	Storage Deficiency
1	SR 5/US-1 & Aviation Blvd.	EB	R	190	410	410	570	No
		WB	L	260	253	260	420	No
		NB	R	480	458	480	670	No
		SB	R	213	215	215	400	No
2	SR 5/US-1 & 26th Street	EB	L	225	138	225	180	Yes
			R	170	295	295	50	Yes
		WB	R	60	20	60	110	No
		NB	L	143	138	143	200	No
		SB	L	18	13	18	570	No
3	SR 5/US-1 & 37th Street	WB	L	88	230	230	200	Yes
		WB	R	315	803	803	200	Yes
		SB	L	498	63	498	130	Yes
4	27th Avenue & Aviation Blvd	WB	L	95	240	240	260	No
		NB	L	303	333	333	200	Yes
			R	0	0	0	200	No
5	County Admin & Aviation Blvd	EB	R	318	13	318	270	Yes
		WB	L	35	15	35	300	No
		NB	L	10	28	28	270	No
			R	38	3	38	220	No
6	SR 5/US-1 & Access Road	WB	R	970	723	970	1130	No
		SB	L	38	38	38	230	No
7	Aviation Blvd. & Roundabout	EB	L	65	55	65	220	No
		WB	R	198	215	215	370	No
		SB	R	8	13	13	170	No

7.6 QUANTITATIVE SAFETY ANALYSIS

A future crash prediction analysis was conducted for the SR 5/US-1 and Aviation Blvd arterial segments under the various project alternatives. The Highway Safety Manual (HSM) Analysis spreadsheet for Urban and Suburban Arterials. The crash prediction analysis follows the methodology outlined in the Highway Safety Manual.

Expected crashes were predicted for the No-Build Alternative for 2025 opening year and 2045 design year using the HSM predictive spreadsheets for urban arterials. The spreadsheet tool implements the Empirical Bayesian Analysis methodology which combines the predicted crashes from the safety performance functions with the historical crash data to obtain the expected crashes. Based on the analysis, the expected annual total crash frequency on the arterials is 21.6 for the 2025 opening year and 28.3 for the 2045 design year for the No-Build Alternative.

To obtain the expected crashes for the various Build Alternatives, Crash Modification Factors (CMF) obtained from the Federal Highway Administration (FHWA) CMF Clearinghouse was applied to the expected crashes for the No-Build Alternative. For Build Alternatives 1 and 2, a CMF of 0.86 (14% crash reduction) for installation of a raised median (CMF ID: 3935) was utilized for the SR 5/US-1 improvements. In addition, a CMF of 0.32 (68% crash reduction) for adding a through lane in both directions and a raised median (CMF ID: 7732) was utilized for the Aviation Blvd roadway improvements. The CMFs from these two improvements were then combined to obtain a composite CMF of 0.28 (72% crash reduction)

For Build Alternative 7, a CMF of 1.112 (11% crash increase) for conversion of the signalized intersection to displaced left turn intersection (CMF ID: 10889) was utilized for the SR 5/US-1 at Aviation Blvd Improvement improvements. In addition, a CMF of 0.32 (68% crash reduction) for adding a through lane in both directions and a raised median (CMF ID: 7732) was utilized for the Aviation Blvd roadway improvements. The CMFs from these two improvements were then combined to obtain a composite CMF of 0.356 (64% crash reduction).

For Build Alternative 8, a CMF of 0.633 (37% crash reduction) for conversion of the signalized intersection to Median U-turn intersection (CMF ID: 10851) was utilized for the SR 5/US-1 at Aviation Blvd Improvement improvements. In addition, a CMF of 0.32 (68% crash reduction) for adding a through lane in both directions and a raised median (CMF ID: 7732) was utilized for the Aviation Blvd roadway improvements. The CMFs from these two improvements were then combined to obtain a composite CMF of 0.20 (80% crash reduction).

Table 7-26 shows the average expected crashes per year along the arterial segments.

Table 7-26 Expected Annual Crashes Frequency							
Crash Severity	2025 Opening Year			2045 Design Year			Crash Reduction
	Fatal and injury	Property damage only	Total	Fatal and injury	Property damage only	Total	
No-Build	7.2	14.5	21.6	9.6	18.7	28.3	-
Build Alt. 1	2.0	4.1	6.0	2.7	5.2	7.9	72%
Build Alt. 2	2.0	4.1	6.0	2.7	5.2	7.9	72%
Build Alt. 7	2.6	5.2	7.8	3.5	6.7	10.2	64%
Build Alt. 8	1.4	2.9	4.3	1.9	3.7	5.7	80%

Based on the results shown in **Table 7-26,** Build Alternative 8 results in the lowest number of expected total crashes with an overall crash reduction of 80% compared to the No-Build Alternative. Build Alternative 1 and Build Alternative 2 provide similar overall crash reduction of 72% compared to No-Alternative whereas Build Alternative 7 provides the least crash reduction of 64% compared to the No-Build Alternative. The detailed crash prediction analyses are provided in **Appendix N**.

8.0 CONCLUSIONS

This Project Traffic Analysis Report documents the traffic methodology, 2021 existing year conditions and future conditions under both the No-Build and Build Alternatives for the 2025 opening and 2045 design years. In addition, this report summarizes the operational analyses of the study intersections and safety performance of the build alternatives for the opening and design years in support of the SR 5/US-1 at Aviation Blvd. PD&E Study. Traffic operational and safety analyses for existing and future conditions were performed using methodologies outlined in the Highway Capacity Manual (HCM) and Highway Safety Manual (HSM).

The future 2045 design year operational analysis indicates that under the No-Build Alternative, most of the study intersections will operate at LOS D or better except for the project intersection at SR 5/US-1 and Aviation Blvd that will operate at LOS F during both the AM and PM peak period. In addition, 4 intersection approaches will operate at LOS F and 3 intersection approaches will operate at LOS E during the AM peak period while 4 intersection approaches will operate at LOS F and 4 intersection approaches will operate at LOS E during the PM peak period.

Four refined build alternatives were evaluated as part of the study. These included the following.

- Alternative 1: Conventional Intersection
- Alternative 2: Twin Intersections or One-way Pairs
- Alternative 7: Displaced Left Turn
- Alternative 8: Median U-turn with Roundabout

The objective was to compare different intersection configurations as well as the lane requirements required to accommodate the 2045 design year traffic demand.

Based on the 2045 design year operational analysis results, for Build Alternative 1, the project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS D during the 2045 design year for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS E or better except for the northbound left turn movement which operates at LOS F during the 2045 PM peak period. For Build Alternative 2, the project intersection will operate at LOS D during the 2045 design year for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound right turn movement at the southbound intersection and the eastbound left turn movement at the northbound intersection which operates at LOS E during the 2045 PM peak period. For Build Alternative 7, the project intersection will operate at LOS C for both the AM and PM peak periods for the 2045 design year. Most of the intersection approaches and movements will also operate at LOS D or better except for the westbound approach, left turn and shared thru-right movements as well as the right turn movement at the displaced left turn cross over which operates at LOS E during both AM and PM peak periods. For Build Alternative 8, the project

intersection will operate at LOS D and LOS C for the AM and PM peak periods respectively. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound and westbound approaches as well as the eastbound thru and westbound left turn movements during the AM peak period and the eastbound approach, thru and right turn movements as well as the westbound left turn movement which operates at LOS E during the PM peak period. From a traffic operations perspective, Build Alternative 7 with the displaced left turn provides the best overall operations.

The quantitative safety analysis prepared as part of the study indicated that Build Alternative 8 results in the lowest number of expected total crashes with an overall crash reduction of 80% compared to the No-Build Alternative. Build Alternative 1 and Build Alternative 2 provide similar overall crash reduction of 72% compared to No-Alternative whereas Build Alternative 7 provides the least crash reduction of 64% compared to the No-Build Alternative.

A comparison of the No-Build Alternatives and the four Build Alternatives indicated that all the build alternatives will provide an operational and safety improvement over the No-Build Alternative for the project intersection at SR 5/US_1 and Aviation Blvd. Build Alternative 1 provides adequate operational and safety improvements at the project intersection while minimizing impacts to the adjacent properties. Build Alternative 7 provides the best operations; however, it also has the least crash reduction compared to the other build alternatives. Both Build Alternatives 2 and 8 require significant right of way impacts; however, they do not result in a significant operational and safety improvement compared to the other build alternatives. Consequently, Build Alternative 1 is recommended as the preferred alternative since it provides the optimal balance between providing adequate traffic operations while minimizing impacts and enhancing safety.

APPENDIX A

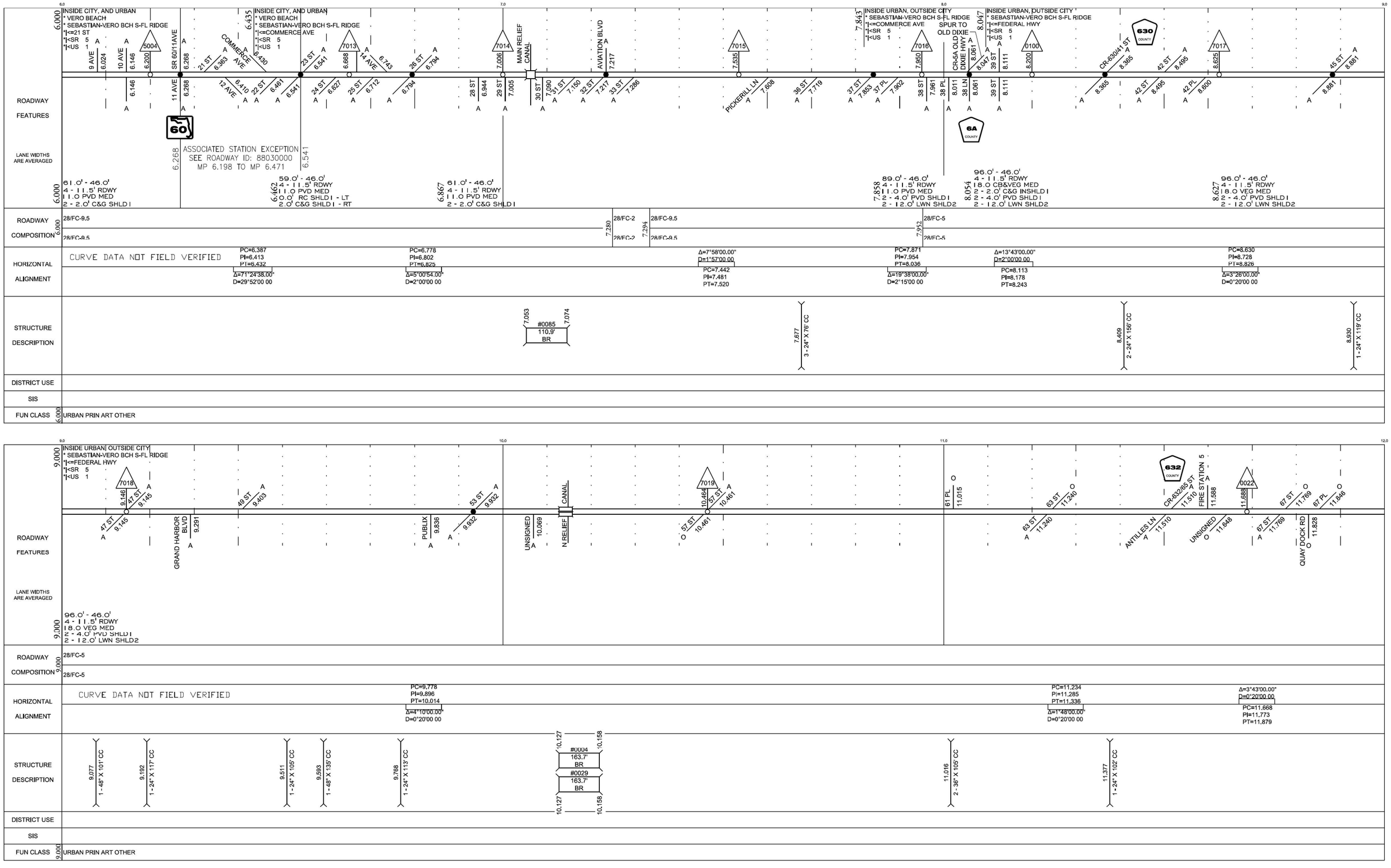
(Straight Line Diagram)

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	04/19/2016	05/05/2016				
BY	CALTRAN	CALTRAN				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02	US 1	SR 5	INDIAN RIVER	04	88010000	2 OF 4



APPENDIX B

(Traffic Data)

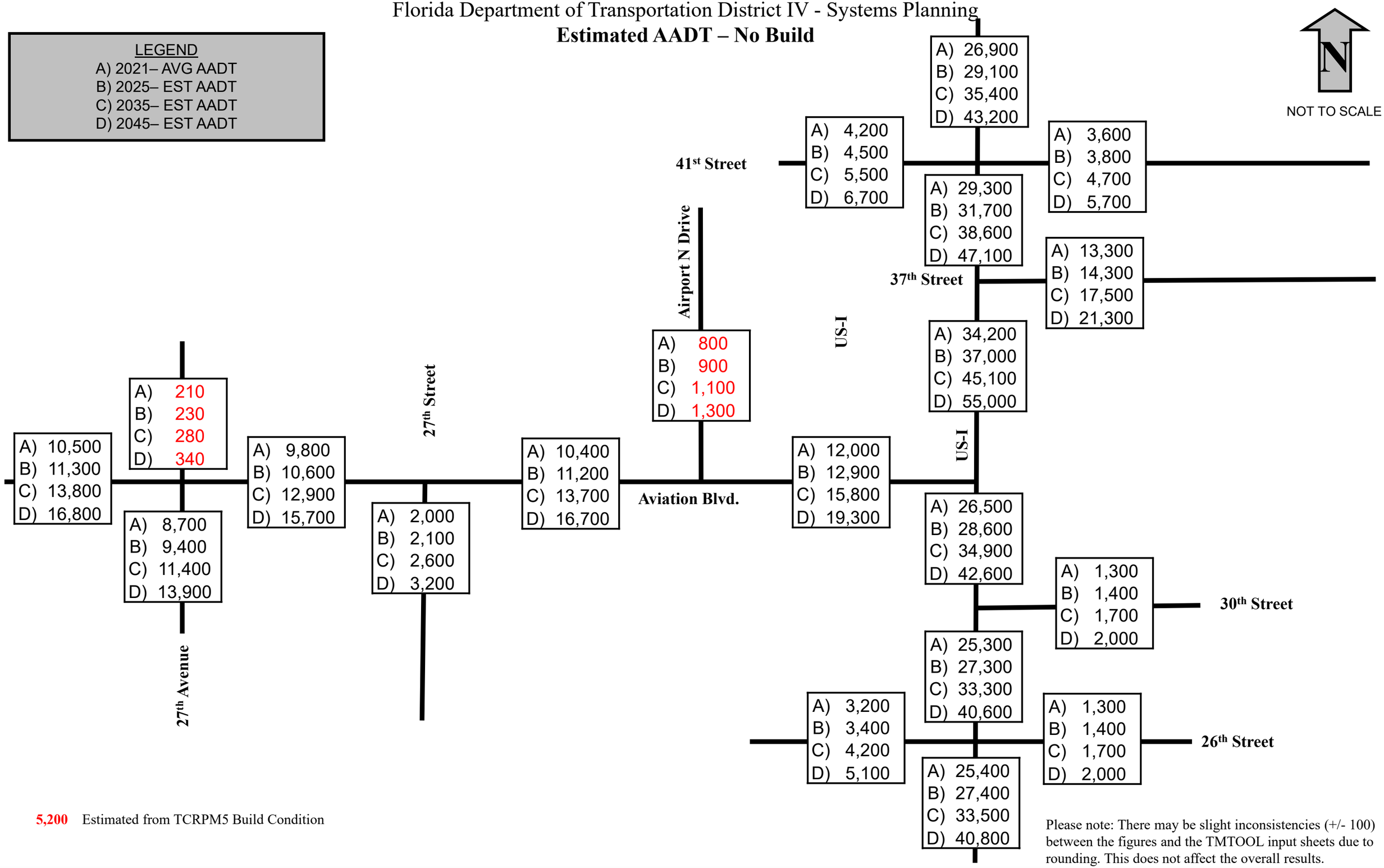
FIGURE 9

Florida Department of Transportation District IV - Systems Planning

Estimated AADT – No Build

LEGEND
A) 2021– AVG AADT
B) 2025– EST AADT
C) 2035– EST AADT
D) 2045– EST AADT

NOT TO SCALE



5,200 Estimated from TCRPM5 Build Condition

Please note: There may be slight inconsistencies (+/- 100) between the figures and the TMTOOL input sheets due to rounding. This does not affect the overall results.

FIGURE 10

Florida Department of Transportation District IV - Systems Planning

Estimated DHV – No Build

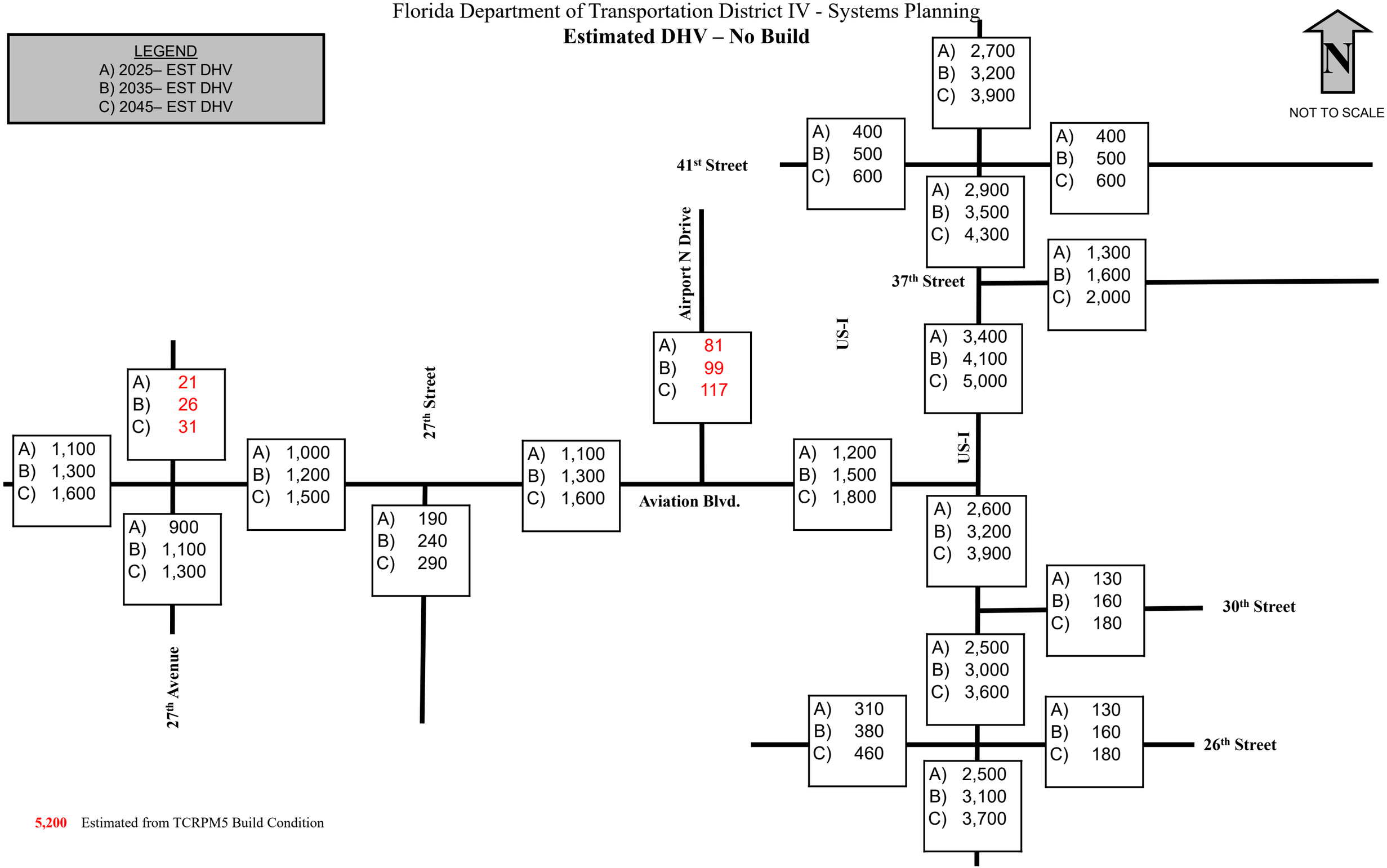


FIGURE 11

Florida Department of Transportation District IV - Systems Planning

Estimated AM Peak Hour Turning Movements – No-Build

LEGEND
A)2021 – AVG TMCs
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE

US-I

41st Street

	A			B			C			D		
A	44	1,398	34	20	24	30	37	81	1,089	22	42	50	63	82
B	51	1,501	40	45	47	51	59	91	1,172	36	102	104	110	127
C	62	1,823	49	27	34	43	53	111	1,427	48	71	85	107	137
D	81	2,207	62					140	1,734	63				

US-I

37th Street

	A			B			C			D		
A	0	1,332	204	76	82	100	121	0	1,196	504	0	0	0	0
B	0	1,438	224	0	0	0	0	0	1,295	538	0	0	0	0
C	0	1,750	275	0	0	0	0	0	1,582	650	0	0	0	0
D	0	2,137	335	161	175	211	261	0	1,923	800	0	0	0	0

US-I

	A			B			C			D		
A	416	1,119	3	1	2	3	5	76	1,076	3	494	528	638	780
B	437	1,198	4	3	4	5	7	89	1,165	4	6	8	10	11
C	526	1,460	5	3	4	5	6	111	1,420	5	57	78	99	128
D	645	1,770	7					138	1,740	6				

US-I

30th Street

	A			B			C			D		
A	0	1,124	33	43	44	55	67	0	1,134	11	0	0	0	0
B	0	1,219	36	0	0	0	0	0	1,224	12	0	0	0	0
C	0	1,482	43	0	0	0	0	0	1,503	17	0	0	0	0
D	0	1,804	46	1	3	4	6	0	1,821	20	0	0	0	0

US-I

26th Street

	A			B			C			D		
A	37	1,059	11	18	20	25	31	70	939	10	140	150	183	218
B	47	1,132	15	26	27	29	33	80	1,016	14	34	35	36	38
C	58	1,376	17	8	11	15	20	95	1,246	17	53	66	88	
D	70	1,676	21					115	1,517	22				

Airport N Drive

	A			B			C			D		
A	4	0	16	0	0	0	0	0	0	0	0	2	4	5
B	6	0	19	0	0	0	0	0	0	0	0	564	687	832
C	7	0	24	0	0	0	0	0	0	0	519			
D	9	0	28	0	0	0	0	0	0	0				

Aviation Blvd.

	A			B			C			D		
A	0	0	0	0	0	0	0	9	0	14	0	0	0	0
B	0	0	0	0	0	0	0	11	0	16	0	0	0	0
C	0	0	0	0	0	0	0	13	0	19	0	0	0	0
D	0	0	0	0	0	0	0	17	0	24	0	0	0	0

27th Street

Aviation Blvd.

	A			B			C			D		
A	1	0	0	0	0	0	0	179	0	195	0	0	0	0
B	3	0	0	0	0	0	0	194	0	211	0	0	0	0
C	5	0	0	0	0	0	0	238	0	257	0	0	0	0
D	6	0	0	0	0	0	0	287	0	314	0	0	0	0

27th Avenue

FIGURE 12

Florida Department of Transportation District IV - Systems Planning

Estimated Midday Peak Hour Turning Movements – No-Build

LEGEND
A)2021 – AVG TMCs
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE

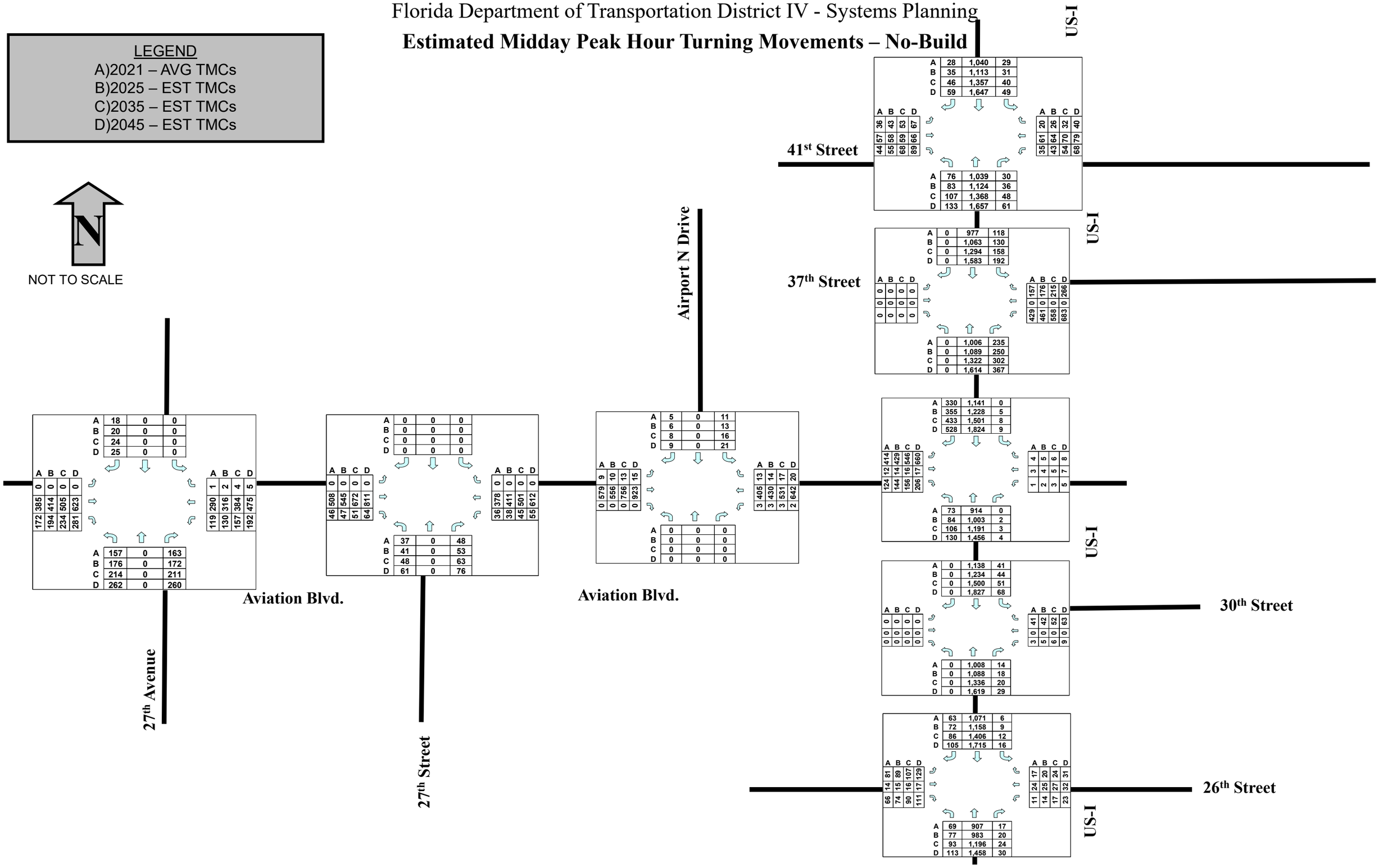


FIGURE 13

Florida Department of Transportation District IV - Systems Planning

Estimated PM Peak Hour Turning Movements – No-Build

LEGEND
A)2021 – AVG TMCs
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE

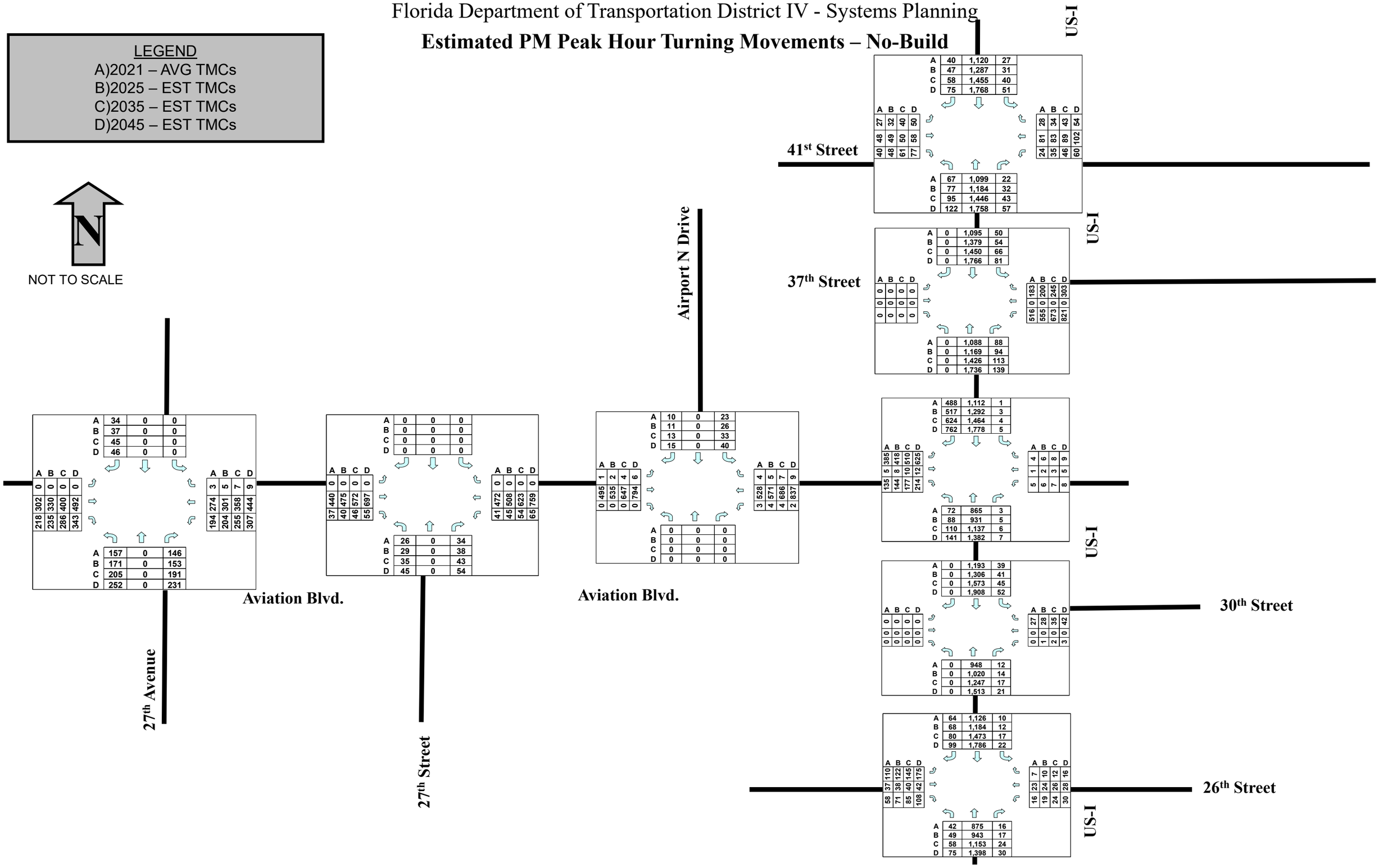


FIGURE 14

Florida Department of Transportation District IV - Systems Planning

Estimated AADT – Build

LEGEND
A) 2021– AVG AADT
B) 2025– EST AADT
C) 2035– EST AADT
D) 2045– EST AADT

NOT TO SCALE

41st Street
A) 4,200
B) 3,800
C) 4,700
D) 5,700

A) 26,900
B) 30,000
C) 36,500
D) 44,600

A) 29,300
B) 31,200
C) 38,000
D) 46,300

A) 3,600
B) 5,500
C) 6,800
D) 8,300

Aviation Blvd Ext.
A) N/A
B) N/A
C) N/A
D) 4,800

A) N/A
B) N/A
C) N/A
D) 5,200

37th Street
A) 13,300
B) 8,000
C) 9,800
D) 12,000

A) N/A
B) N/A
C) N/A
D) 5,400

Airport N Drive
A) 800
B) 900
C) 1,100
D) 1,300

US-1
A) 34,200
B) 30,800
C) 37,500
D) 45,800

A) N/A
B) N/A
C) N/A
D) 11,000

Aviation Blvd Ext.

A) 210
B) 230
C) 280
D) 340

A) 10,500
B) 12,000
C) 14,600
D) 17,800

A) 8,700
B) 9,400
C) 11,400
D) 13,900

27th Avenue

A) 9,800
B) 11,200
C) 13,700
D) 16,600

27th Street

A) 2,000
B) 2,100
C) 2,600
D) 3,200

A) 10,400
B) 11,800
C) 14,500
D) 17,600

Aviation Blvd.

A) 12,000
B) 13,600
C) 16,700
D) 20,400

A) 26,500
B) 29,000
C) 35,400
D) 43,200

A) 1,300
B) 1,400
C) 1,700
D) 2,000

30th Street

A) 25,300
B) 25,900
C) 31,600
D) 38,600

A) 3,200
B) 3,400
C) 4,200
D) 5,100

A) 1,300
B) 1,400
C) 1,700
D) 2,000

26th Street

A) 25,400
B) 29,500
C) 36,100
D) 44,000

5,200 Estimated from TCRPM5 Build Condition

Proposed Future Extension – By Others

Please note: There may be slight inconsistencies (+/- 100) between the figures and the TMTOOL input sheets due to rounding. This does not affect the overall results.

FIGURE 15

Florida Department of Transportation District IV - Systems Planning

Estimated DHV - Build

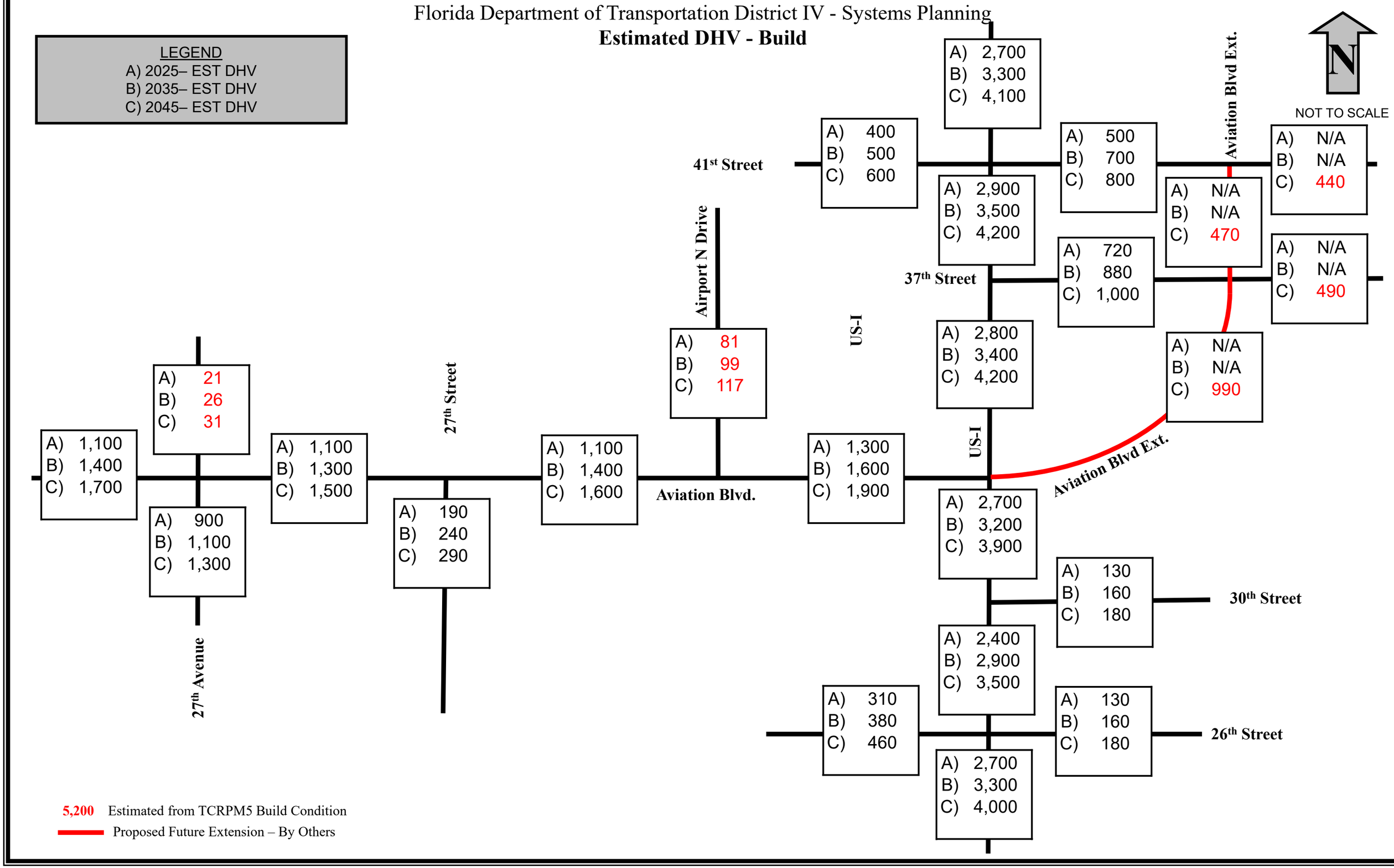


FIGURE 16

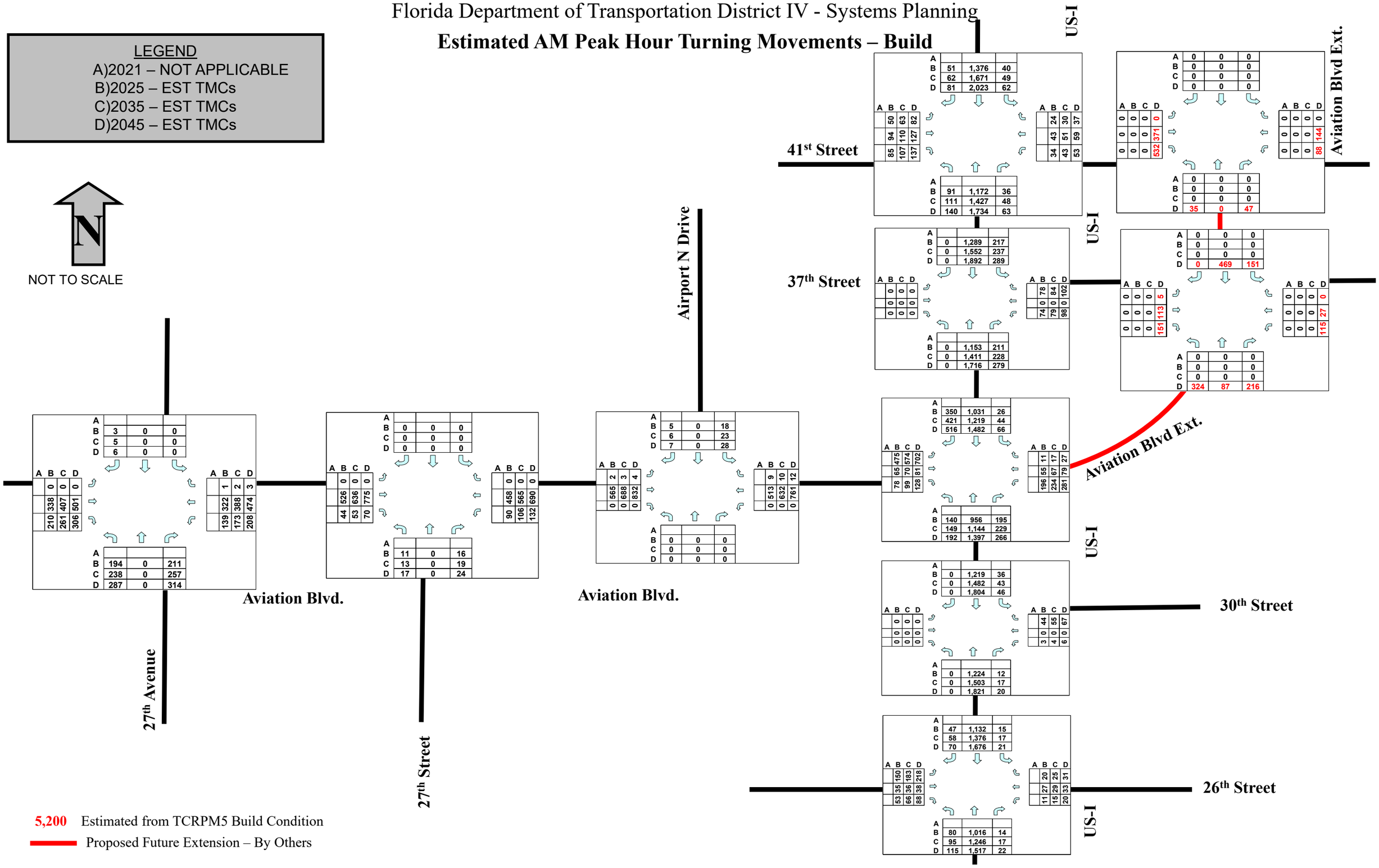
Florida Department of Transportation District IV - Systems Planning

Estimated AM Peak Hour Turning Movements – Build

LEGEND
A)2021 – NOT APPLICABLE
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE



5,200 Estimated from TCRPM5 Build Condition

Proposed Future Extension – By Others

FIGURE 17

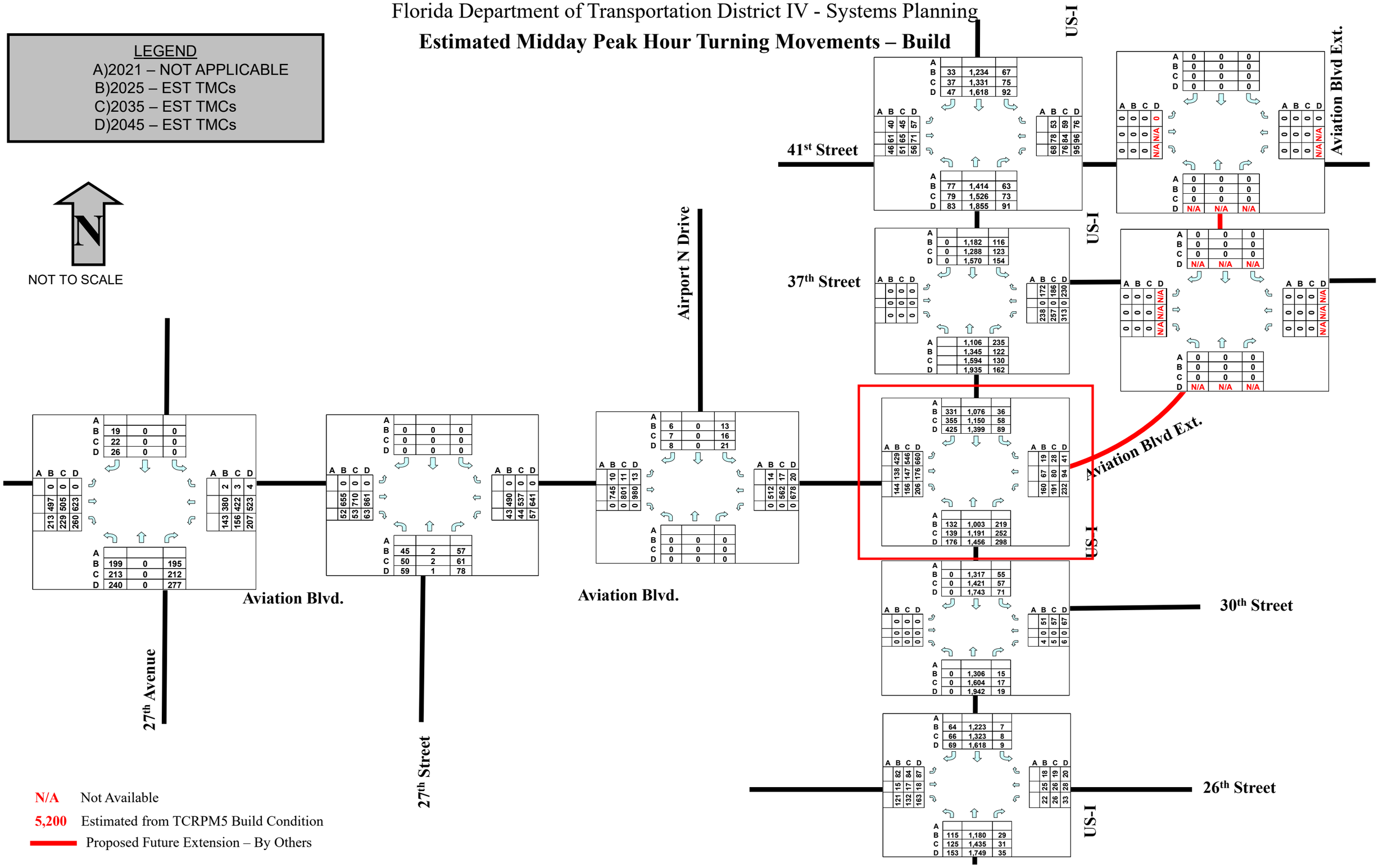
Florida Department of Transportation District IV - Systems Planning

Estimated Midday Peak Hour Turning Movements – Build

LEGEND
A)2021 – NOT APPLICABLE
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE



N/A Not Available

5,200 Estimated from TCRPM5 Build Condition

Proposed Future Extension – By Others

FIGURE 18

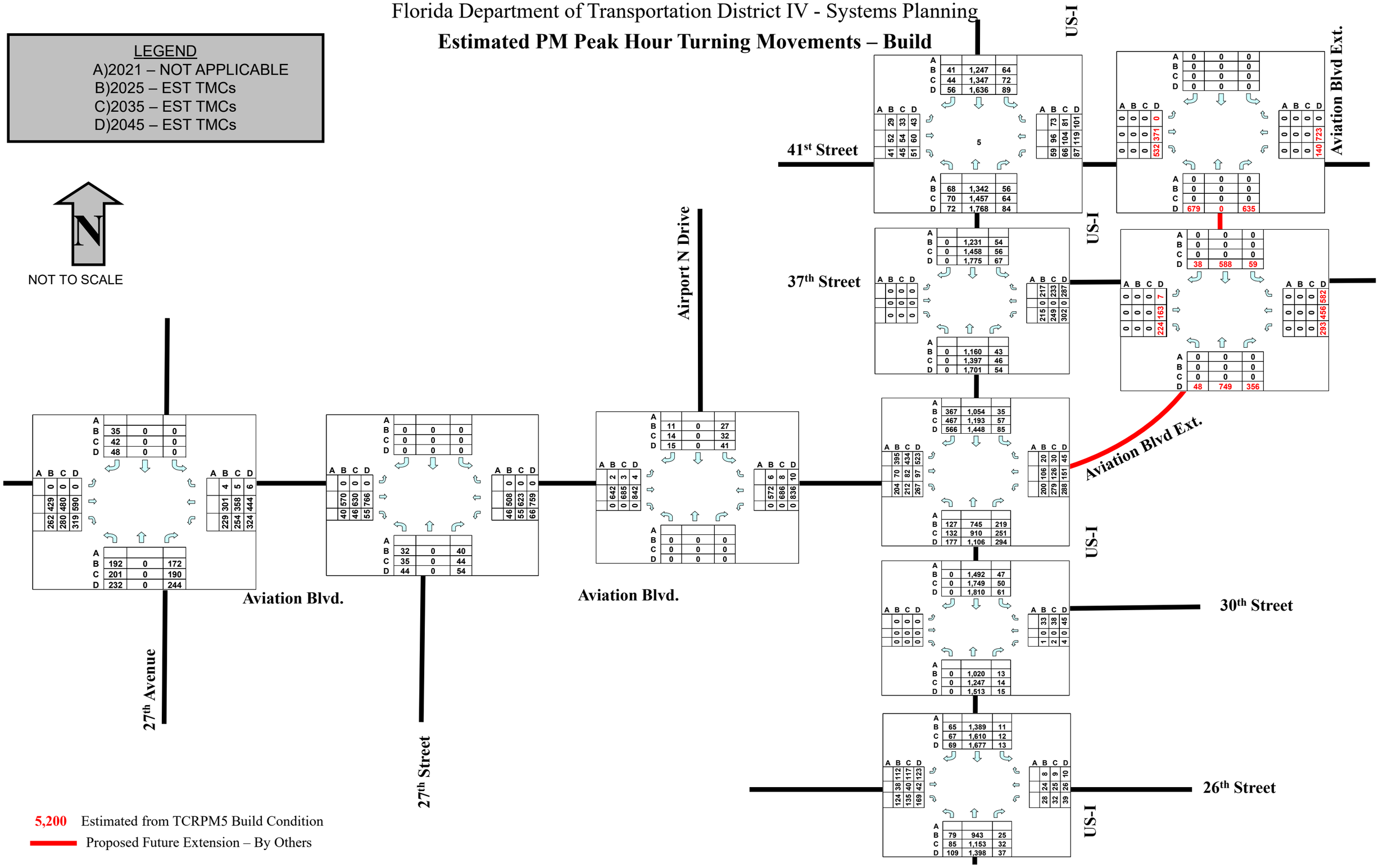
Florida Department of Transportation District IV - Systems Planning

Estimated PM Peak Hour Turning Movements – Build

LEGEND
A)2021 – NOT APPLICABLE
B)2025 – EST TMCs
C)2035 – EST TMCs
D)2045 – EST TMCs

N

NOT TO SCALE



APPENDIX C

(Existing Signal Phasing and Timing Plans)

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

Intersection Number: 100
Intersection Name: 23 ST @ US#1
Controller Type: Econolite ASC 3
Date: 05/16/22

PHASE	1	2	3	4	5	6	7	8
APPROACH	SB LT	NB		EB	NB LT	SB	EB LT	WB
INITIAL	5	15		6	5	15	6	6
PASSAGE	3	4		4	3	4	3	4
YELLOW	3.7	4		3.7	3.7	4	3.7	3.7
ALL RED	2.5	2		2.1	2.6	2	2	2.3
MAX 1	20	45		30	20	45	15	30
MAX 2								
WALK		11		6				
PED CLEAR		21		21				
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON LOCK	X			X	X		X	X
CNA 1		X				X		

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	
PHASE		OL A-B	OL A-B	2-6	2-6	2-6
TIMING	5	6	4	4	4	1.5

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2-6	YES	YES	YES	2-6	4-8
				1-5-7		

Double clearance OVL RxR Signs on During Preemption

OVL A eastbound left turn green=3 yellow=3.7 red=2.1

OVL B eastbound through green=3 yellow=3.7 red=2.1

Season
pm System Cycle 140
Free Cycle 134

TIMING BY: J.ANKENY

SYC

APPROVED BY:

GIS

23ST@US1.xls
5/16/2022

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

100 COORDINATION

23 ST @ US#1

SPLIT	SECONDS		TRANSITION	SMOOTH		MAX SELECT	INHIBITMAX
OFFSET	SECONDS		OFFSET REF.	YELLOW		FORCE OFF	FIXED

PATTERN 1

AM	CYCLE	120		TIMING PLAN	0				RINGS IN SECONDS				
	OFFSET	22		ACTION PLAN	0				R1	64	56	120	
INBOUND									R2	64	56	120	
PHASE	1	2	3	4	5	6	7	8					
%	15.0%	38.3%	0.0%	46.7%	15.0%	38.3%	21.7%	25.0%	R1	18	46	0	56
sec	18	46	0	56	18	46	26	30	R2	18	46	26	30

PATTERN 2

MID	CYCLE	120		TIMING PLAN	0				RINGS IN SECONDS				
	OFFSET	103		ACTION PLAN	0				R1	64	56	120	
									R2	64	56	120	
PHASE	1	2	3	4	5	6	7	8					
%	15.0%	38.3%	0.0%	46.7%	15.0%	38.3%	21.7%	25.0%	R1	18	46	0	56
sec	18	46	0	56	18	46	26	30	R2	18	46	26	30

PATTERN 3

PM	CYCLE	120		TIMING PLAN	0				RINGS IN SECONDS				
	OFFSET	109		ACTION PLAN	0				R1	64	56	120	
OUTBOUND									R2	64	56	120	
PHASE	1	2	3	4	5	6	7	8					
%	15.0%	38.3%	0.0%	46.7%	15.0%	38.3%	21.7%	25.0%	R1	18	46	0	56
sec	18	46	0	56	18	46	26	30	R2	18	46	26	30

PATTERN 4

AM	CYCLE	140		TIMING PLAN	0				RINGS IN SECONDS				
	OFFSET	32		ACTION PLAN	0				R1	74	66	140	
INBOUND									R2	74	66	140	
PHASE	1	2	3	4	5	6	7	8					
%	12.9%	40.0%	0.0%	47.1%	12.9%	40.0%	21.4%	25.7%	R1	18	56	0	66
sec	18	56	0	66	18	56	30	36	R2	18	56	30	36

PATTERN 5

MID	CYCLE	140		TIMING PLAN	0				RINGS IN SECONDS				
	OFFSET	1		ACTION PLAN	0				R1	73	67	140	
									R2	73	67	140	
PHASE	1	2	3	4	5	6	7	8					
%	12.9%	39.3%	0.0%	47.9%	12.9%	39.3%	22.1%	25.7%	R1	18	55	0	67
sec	18	55	0	67	18	55	31	36	R2	18	55	31	36

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

PATTERN 6

PM	CYCLE	140		TIMING PLAN	0
	OFFSET	4		ACTION PLAN	0
OUTBOUND					

RINGS IN SECONDS

R1	73	67	140
R2	73	67	140

PHASE	1	2	3	4	5	6	7	8
%	12.9%	39.3%	0.0%	47.9%	12.9%	39.3%	22.1%	25.7%
sec	18	55	0	67	18	55	31	36

R1	18	55	0	67
R2	18	55	31	36

PATTERN 7

	CYCLE	0		TIMING PLAN	0
	OFFSET	0		ACTION PLAN	0

RINGS IN SECONDS

R1	0	0	0
R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 8

	CYCLE	0		TIMING PLAN	0
	OFFSET	0		ACTION PLAN	0

RINGS IN SECONDS

R1	0	0	0
R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 9

	CYCLE	0		TIMING PLAN	0
	OFFSET	0		ACTION PLAN	0

RINGS IN SECONDS

R1	0	0	0
R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 10

	CYCLE	0		TIMING PLAN	0
	OFFSET	0		ACTION PLAN	0

RINGS IN SECONDS

R1	0	0	0
R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

100 TIME OF DAY

23 ST @ US#1

ACTION PLAN 11 = FLASH
ACTION PLAN 12 = FREE

ACTION PLAN 1			PATTERN		1		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 2			PATTERN		2		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 3			PATTERN		3		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 4			PATTERN		4		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 5			PATTERN		5		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

ACTION PLAN 6			PATTERN		6		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 7			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 8			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 9			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 10			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 11	PATTERN	FLASH	DETECTOR PLAN	0

ACTION PLAN 12	PATTERN	FREE	DETECTOR PLAN	0

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

Intersection Number: 100
Intersection Name: 23 ST @ US#1

DAY PLAN 1

EVENT	PLAN	TIME
1	12	0:00
2	1	7:15
3	2	9:00
4	3	15:45
5	12	19:30
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 2

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 3

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 4

EVENT	PLAN	TIME
1	12	0:00
2	4	7:15
3	5	9:00
4	6	15:45
5	12	19:30
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 5

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 6

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

WEEK PLAN 1	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	ALL WEEKS
BASE DAY	3	4	4	4	4	4	2	WEEKS	

WEEK PLAN 2	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

WEEK PLAN 3	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

INDIAN RIVER COUNTY
TRAFFIC ENGINEERING
TRAFFIC SIGNAL TIMING SHEET

EXCEPTION DAY IMPLEMENT FOR YEAR SEE HOLIDAY TIME SHEET

DAY	EVENT	FIXED / FLOAT	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1	LABOR DAY	FLOAT	9	2	1	2
2	VETERAN'S DAY	FIXED	11	11	0	2
3	THANKSGIVING	FLOAT	11	5	4	3
4	CHRISTMAS	FIXED	12	25	0	3
5	NEW YEAR'S	FIXED	1	1	0	3
6	MEMORIAL DAY	FLOAT	5	2	5	2
7	4 OF JULY	FIXED	7	4	0	2
8						
9						
10						
11						
12						

PROGRAM LOGIC

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 103
Intersection Name: 26 ST / US#1 / ST. LUCIE AVE
Controller Type: ASC 3
Date: 04/21/20

PHASE	1	2	3	4	5	6	7	8
APPR OACH	US1 NBLT	US1 NB/SB	ST LU. NB/SB	EB	WB	RXR EMPT		
INITIAL	5	15	8	8	6	5		
PASSAGE	3	4	4	4	4	2		
YELLOW	3.7	4.8	3.7	3.7	3.7	4		
ALL RED	2.7	2	2.4	2.3	2.3	2		
MAX 1	15	45	25	35	20	9		
MAX 2								
WALK		6	6		7			
PED CLEAR		21	25		24			
MIN RECALL		X						
MAX RECALL								
PED RECALL								
NON LOCK	X		X	X	X	X		
CNA 1		X						

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	ALL RED
PHASE		OL A-C	OL A-C	2-3 OLB	2-3 OLB	2-3 OLB
TIMING	5	6	4	10	4.8	2.0

PH 3 MUST BE EXIT PHASE AFTER RXR PREEMPTION

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2	NO	YES	YES	2	5
				1		

SEQUENTIAL PHASING (3) DOUBLE CLEARANCE OVER LAPS RXR PREMPT PH 6

OVL A (1+2+5) OVL B (1+2) OVL D (3+4) OVL C (3+4) RXR CLEARANCE PH 6 - OVL A+C

OVL A Westbound Green= 6 - Yellow=3.7 - Red=2 OVL D #1 Eastbound Green=4 - Yellow=3.7 - Red=0

OVL C #2 Eastbound Green=6 - Yellow=3.7 - Red=2

Season
pm System Cycle 140
Free Cycle 145.3

SYC

GIS

TIMING BY: J.ANKENY

APPROVED BY:

26ST@US1
10/15/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

103 COORDINATION

26 ST / US#1 / ST. LUCIE AVE

SPLIT	SECONDS		TRANSITION	SMOOTH		MAX SELECT	INHIBITMAX
OFFSET	SECONDS		OFFSET REF.	YELLOW		FORCE OFF	FIXED

PATTERN 1

AM	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS			
	OFFSET	119		ACTION PLAN	0		R1	57	46	103
INBOUND							R2	17	0	17
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	34.2%	14.2%	24.2%	14.2%	0.0%	0.0%	0.0%	R1	16	41	17	29
sec	16	41	17	29	17	0	0	0	R2	17	0	0	0

PATTERN 2

MID	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS			
	OFFSET	107		ACTION PLAN	0		R1	57	46	103
							R2	17	0	17
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	34.2%	14.2%	24.2%	14.2%	0.0%	0.0%	0.0%	R1	16	41	17	29
sec	16	41	17	29	17				R2	17	0	0	0

PATTERN 3

PM	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS			
	OFFSET	114		ACTION PLAN	0		R1	57	46	103
OUTBOUND							R2	17	0	17
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	34.2%	14.2%	24.2%	14.2%	0.0%	0.0%	0.0%	R1	16	41	17	29
sec	16	41	17	29	17				R2	17	0	0	0

PATTERN 4

AM	CYCLE	140		TIMING PLAN	0		RINGS IN SECONDS			
	OFFSET	113		ACTION PLAN	0		R1	73	50	123
INBOUND							R2	17	0	17
PHASE	1	2	3	4	5	6	7	8						
%	12.9%	39.3%	15.7%	20.0%	12.1%	0.0%	0.0%	0.0%	R1	18	55	22	28
sec	18	55	22	28	17				R2	17	0	0	0

PATTERN 5

MID	CYCLE	140		TIMING PLAN	0		RINGS IN SECONDS			
	OFFSET	120		ACTION PLAN	0		R1	72	50	122
							R2	18	0	18
PHASE	1	2	3	4	5	6	7	8						
%	12.9%	38.6%	17.1%	18.6%	12.9%	0.0%	0.0%	0.0%	R1	18	54	24	26
sec	18	54	24	26	18				R2	18	0	0	0

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

PATTERN 6

PM	CYCLE	140		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	4		ACTION PLAN	0	R1	73	49	122
OUTBOUND						R2	18	0	18

PHASE	1	2	3	4	5	6	7	8					
%	12.1%	40.0%	17.1%	17.9%	12.9%	0.0%	0.0%	0.0%	R1	17	56	24	25
sec	17	56	24	25	18				R2	18	0	0	0

PATTERN 7

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8					
%	%	%	%	%	%	%	%	%	R1	0	0	0	0
sec									R2	0	0	0	0

PATTERN 8

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8					
%	%	%	%	%	%	%	%	%	R1	0	0	0	0
sec									R2	0	0	0	0

PATTERN 9

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8					
%	%	%	%	%	%	%	%	%	R1	0	0	0	0
sec									R2	0	0	0	0

PATTERN 10

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8					
%	%	%	%	%	%	%	%	%	R1	0	0	0	0
sec									R2	0	0	0	0

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

103 TIME OF DAY

26 ST / US#1 / ST. LUCI

ACTION PLAN 11 = FLASH
ACTION PLAN 12 = FREE

ACTION PLAN 1			PATTERN		1		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

ACTION PLAN 2			PATTERN		2		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

ACTION PLAN 3			PATTERN		3		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

ACTION PLAN 4			PATTERN		4		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

ACTION PLAN 5			PATTERN		5		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

ACTION PLAN 6			PATTERN		6		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X						

ACTION PLAN 7			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 8			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 9			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 10			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 11	PATTERN	FLASH	DETECTOR PLAN	0

ACTION PLAN 12	PATTERN	FREE	DETECTOR PLAN	0

26ST@US1
10/15/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 103
Intersection Name: 26 ST / US#1 / ST. LUCIE AVE

DAY PLAN 1

EVENT	PLAN	TIME
1	1	7:15
2	2	9:00
3	3	15:45
4	12	19:30
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 2

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 3

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 4

EVENT	PLAN	TIME
1	4	7:15
2	5	9:00
3	6	15:45
4	12	19:30
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 5

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 6

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

WEEK PLAN 1	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY	3	4	4	4	4	4	2	WEEKS	ALL WEEKS

WEEK PLAN 2	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

WEEK PLAN 3	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

EXCEPTION DAY IMPLEMENT

DAY	EVENT	FIXED / FLOAT	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1	LABOR DAY	FLOAT	9	2	1	2
2	VETERAN'S DAY	FIXED	11	11	0	2
3	THANKSGIVING	FLOAT	11	5	4	3
4	CHRISTMAS	FIXED	12	25	0	3
5	NEW YEAR'S	FIXED	1	1	0	3
6	MEMORIAL DAY	FLOAT	5	2	5	2
7	4 OF JULY	FIXED	7	4	0	2
8						
9						
10						
11						
12						

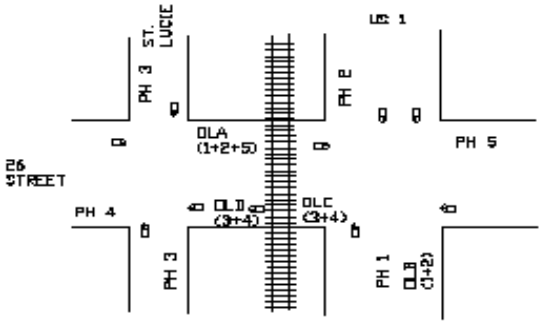
PROGRAM LOGIC

1,2,3,7 RXR preemption 4,5,6 Coord removal for long don't walk

1	IF RXR PREMPT DWELL=ON THEN	SET LOGIC FLAG 1	ON
2	IF LOGIC FLAG 1=ON THEN	SET OVL A RED	ON
		SET OVL A YELLOW	OFF
		SET OVL A GREEN	OFF
		SET PH 3 GREEN	ON
		SET PH 3 RED	OFF
3	IF TIMING PH 3 THEN	SET LOGIC FLAG 1	OFF
4	IF PH 3 WALK OR PH 5 WALK THEN	SET LOGIC FLAG 2	ON
5	IF LOGIC FLAG 2=ON THEN	SET COORD FREE	ON
6	IF TIMING PH 2 THEN	SET LOGIC FLAG 2	OFF
7	IF RXR PREMPT = OFF THEN	SET OMIT PH 6	ON

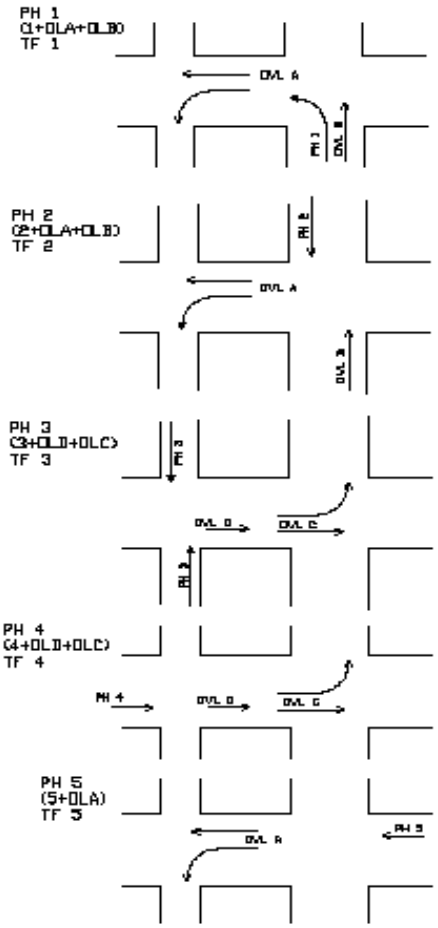
26ST@US1
10/15/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet



120 SECOND CYCLE

PHASE	1	2	3	4	5
PH SPLIT					
SECONDS	16	44	20	20	20



PHASE 1
HAS A SPLIT OF 16 SECONDS
OVER LAP A AND B TIME WITH PHASE 1.
UPON TERMINATION ONLY PHASE 1
TERMINATES, OVER LAP A AND B REMAIN
GREEN.

PHASE 2
HAS A SPLIT OF 44 SECONDS
OVER LAP A AND B TIME WITH PHASE 2
UPON TERMINATION ALL TERMINATE.
OVER LAP A IS A DELAY OVER LAP. IT WILL
STAY GREEN FOR 2 MORE SECONDS AFTER
PHASE 2 HAS TURNED RED. THEN IT WILL HAVE
A 4 SECOND YELLOW AND A 1 SECOND RED. THE
DELAY ADDS TO 7 SECONDS THAT WILL TIMED
DURING THE NEXT PHASE SPLIT. (PHASE 3)

PHASE 3
HAS A PLIT OF 20 SECOND. OVER LAP A DELAY
USED 7 SECONDS OF THE 20 SECONS ALLOWED
FOR PHASE 3 SPLIT. THE ACTUAL SPLIT TIME FOR
PHASE 3 IS 13 SECONDS. (8 GREEN, 4 YELLOW, 1
RED) OVER LAP C AND D TIME WITH PHASE 3.
UPON TERMINATION ONLY PHASE 3 TERMINATES
OVER LAP D AND C REMAIN GREEN.

PHASE 4
HAS A SPLIT OF 20 SECONDS.
OVER LAP C AND D TIME WITH PHASE 4. UPON
TERMINATION ALL TERMINATE, OVER LAP C AND D
ARE DELAY OVER LAPS. THE DELAYS TIME
CONCURRENTLY SO I WILL ONLY ADDRESS OVER
LAP C THE LONGEST. OVER LAP C HAS A DELAY
OF 2 SECONDS GREEN, 4 SECONDS YELLOW AND 1
SECOND OF RED FOR A TOTAL OF 7 SECONDS TO
BE TIMED DURING THE NEXT PHASE SPLIT. (PHASE
5)

PHASE 5
PHASE 5 HAS A SPLIT OF 20 SECONDS.
DELAY OVER LAP C USED 7 SECONDS OF PHASE 5
SPLIT. THE ACTUAL SPLIT IS 13 SECONDS. OVER LAP
A TIMES WITH PHASE 5. UPON TERMINATION ONLY
PHASE 5 TERMINATES. OVER LAP A REMAINS GREEN.

26ST@US1
10/15/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 111
Intersection Name: 32 ST @ US#1
Controller Type: ASC 3
Date: 01/13/22

PHASE	1	2	3	4	5	6	7	8
APPROACH	NB LT	SB	EB			NB		WB
INITIAL	5	20	6			20		4
PASSAGE	3	4	4			4		4
YELLOW	3.7	4.8	4			4.8		4
ALL RED	2.6	2	0			2		2.2
MAX 1	20	50	30			50		20
MAX 2								
WALK		14	7			14		
PED CLEAR		13	20			13		
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON LOCK	X		X					X
CNA 1		X				X		

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	
PHASE		OLC	OLC	2-6	2-6	2-6
TIMING	5	8	4	20	4.8	2

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2-6	NO	YES	YES	2-6	8
				1		

E/W SPLIT PHASING

RR Preemption - cycle max 2 after Track clearance phase 11 (brings up overlap C in preemption)

Phase 3 double clearance OVL C green=4 yellow=4.0 red=2.0

Ped timing for phase 2 for coordination.

Season
pm System Cycle 140
Free Cycle 117.1
SYC

TIMING BY: _____

APPROVED BY: _____

GIS

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

111 COORDINATION

32 ST @ US#1

SPLIT	SECONDS		TRANSITION	SMOOTH		MAX SELECT	INHIBITMAX
OFFSET	SECONDS		OFFSET REF.	YELLOW		FORCE OFF	FIXED

PATTERN 1

AM	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS							
	OFFSET	89		ACTION PLAN	0			R1	64	41	105			
INBOUND								R2	64	15	79			
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	40.0%	34.2%	0.0%	0.0%	53.3%	0.0%	12.5%	R1	16	48	41	0	
sec	16	48	41	0	0	64	0	15	R2	0	64	0	15	

PATTERN 2

MID	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS							
	OFFSET	48		ACTION PLAN	0			R1	64	41	105			
								R2	64	15	79			
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	40.0%	34.2%	0.0%	0.0%	53.3%	0.0%	12.5%	R1	16	48	41	0	
sec	16	48	41	0	0	64	0	15	R2	0	64	0	15	

PATTERN 3

PM	CYCLE	120		TIMING PLAN	0		RINGS IN SECONDS							
	OFFSET	70		ACTION PLAN	0			R1	64	41	105			
OUTBOUND								R2	64	15	79			
PHASE	1	2	3	4	5	6	7	8						
%	13.3%	40.0%	34.2%	0.0%	0.0%	53.3%	0.0%	12.5%	R1	16	48	41	0	
sec	16	48	41	0	0	64	0	15	R2	0	64	0	15	

PATTERN 4

AM	CYCLE	140		TIMING PLAN	0		RINGS IN SECONDS							
	OFFSET	81		ACTION PLAN	0			R1	80	45	125			
INBOUND								R2	80	15	95			
PHASE	1	2	3	4	5	6	7	8						
%	12.9%	44.3%	32.1%	0.0%	0.0%	57.1%	0.0%	10.7%	R1	18	62	45	0	
sec	18	62	45			80		15	R2	0	80	0	15	

PATTERN 5

MID	CYCLE	140		TIMING PLAN	0		RINGS IN SECONDS							
	OFFSET	81		ACTION PLAN	0			R1	90	35	125			
								R2	90	15	105			
PHASE	1	2	3	4	5	6	7	8						
%	12.9%	51.4%	25.0%	0.0%	0.0%	64.3%	0.0%	10.7%	R1	18	72	35	0	
sec	18	72	35			90		15	R2	0	90	0	15	

32ST@US1.xls
1/13/2022

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

PATTERN 6

PM	CYCLE	140		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	119		ACTION PLAN	0	R1	85	40	125
OUTBOUND						R2	85	15	100

PHASE	1	2	3	4	5	6	7	8
%	12.9%	47.9%	28.6%	0.0%	0.0%	60.7%	0.0%	10.7%
sec	18	67	40			85		15

R1	18	67	40	0
R2	0	85	0	15

PATTERN 7

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 8

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 9

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 10

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

111 TIME OF DAY

32 ST @ US#1

ACTION PLAN 11 = FLASH
ACTION PLAN 12 = FREE

ACTION PLAN 1			PATTERN		1		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 2			PATTERN		2		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 3			PATTERN		3		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 4			PATTERN		4		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 5			PATTERN		5		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

ACTION PLAN 6			PATTERN		6		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 7			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 8			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 9			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 10			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 11	PATTERN	FLASH	DETECTOR PLAN	0

ACTION PLAN 12	PATTERN	FREE	DETECTOR PLAN	0

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 111
Intersection Name: 32 ST @ US#1

DAY PLAN 1

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3	1	7:15
4	2	9:00
5	3	15:45
6	12	19:30
7		
8		
9		
10		
11		
12		

DAY PLAN 2

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 3

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 4

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3	4	7:15
4	5	9:00
5	6	15:45
6	12	19:30
7		
8		
9		
10		
11		
12		

DAY PLAN 5

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 6

EVENT	PLAN	TIME
1	11	0:00
2	12	6:00
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

WEEK PLAN 1	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	ALL WEEKS
BASE DAY	3	4	4	4	4	4	2	WEEKS	

WEEK PLAN 2	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

WEEK PLAN 3	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

EXCEPTION DAY IMPLEMENT FOR YEAR SEE HOLIDAY TIME SHEET

DAY	EVENT	FIXED / FLOAT	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1	LABOR DAY	FLOAT				2
2	VETERAN'S DAY	FIXED	11	11	0	2
3	THANKSGIVING	FLOAT				3
4	CHRISTMAS	FIXED	12	25	0	3
5	NEW YEAR'S	FIXED	1	1	0	3
6	MEMORIAL DAY	FLOAT				2
7	4 OF JULY	FIXED	7	4	0	2
8						
9						
10						
11						
12						

PROGRAM LOGIC

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 21
Intersection Name: 37 ST @ US#1
Controller Type: Cobalt
Date: 04/21/20

PHASE	1	2	3	4	5	6	7	8
APPROACH		SB		WB	SBLT	NB		
INITIAL		15		6	5	15		not used
PASSAGE		5		4	3	5		4
YELLOW		4.8		4	3.7	4.8		4
ALL RED		2		2.6	2.3	2		2.6
MAX 1		45		35	25	45		35
MAX 2								
WALK		9				9		
PED CLEAR		24				24		
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON LOCK				X	X			
CNA 1		X				X		

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	
PHASE						
TIMING						

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2-6	YES	YES	YES	2-6	4
				5		

Removed Nigh time flash 02/18/20

Season
pm System Cycle 140
Free Cycle 124.4
SYC

TIMING BY: J.ANKENY
APPROVED BY:

GIS

37ST@US1
10/28/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

21 COORDINATION

37 ST @ US#1

SPLIT	SECONDS		TRANSITION	SMOOTH		MAX SELECT	INHIBITMAX
OFFSET	SECONDS		OFFSET REF.	YELLOW		FORCE OFF	FIXED

PATTERN 1

AM	CYCLE	120		TIMING PLAN	0			RINGS IN SECONDS						
	OFFSET	41		ACTION PLAN	0				R1	86	34	120		
INBOUND									R2	86	0	86		
PHASE	1	2	3	4	5	6	7	8						
%	0.0%	71.7%	0.0%	28.3%	15.0%	56.7%	0.0%	0.0%	R1	0	86	0	34	
sec	0	86	0	34	18	68	0	0	R2	18	68	0	0	

PATTERN 2

MID	CYCLE	120		TIMING PLAN	0			RINGS IN SECONDS						
	OFFSET	0		ACTION PLAN	0				R1	86	34	120		
									R2	86	0	86		
PHASE	1	2	3	4	5	6	7	8						
%	0.0%	71.7%	0.0%	28.3%	15.0%	56.7%	0.0%	0.0%	R1	0	86	0	34	
sec	0	86	0	34	18	68	0	0	R2	18	68	0	0	

PATTERN 3

PM	CYCLE	120		TIMING PLAN	0			RINGS IN SECONDS						
	OFFSET	8		ACTION PLAN	0				R1	86	34	120		
IOUTBOUND									R2	86	0	86		
PHASE	1	2	3	4	5	6	7	8						
%	0.0%	71.7%	0.0%	28.3%	15.0%	56.7%	0.0%	0.0%	R1	0	86	0	34	
sec	0	86	0	34	18	68	0	0	R2	18	68	0	0	

PATTERN 4

AM	CYCLE	140		TIMING PLAN	0			RINGS IN SECONDS						
	OFFSET	84		ACTION PLAN	0				R1	105	35	140		
INBOUND									R2	105	0	105		
PHASE	1	2	3	4	5	6	7	8						
%	0.0%	75.0%	0.0%	25.0%	20.0%	55.0%	0.0%	0.0%	R1	0	105	0	35	
sec		105		35	28	77			R2	28	77	0	0	

PATTERN 5

MID	CYCLE	140		TIMING PLAN	0			RINGS IN SECONDS						
	OFFSET	84		ACTION PLAN	0				R1	105	35	140		
									R2	105	0	105		
PHASE	1	2	3	4	5	6	7	8						
%	0.0%	75.0%	0.0%	25.0%	15.7%	59.3%	0.0%	0.0%	R1	0	105	0	35	
sec		105		35	22	83			R2	22	83	0	0	

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

PATTERN 6

PM	CYCLE	140		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	30		ACTION PLAN	0	R1	102	38	140
OUTBOUND						R2	102	0	102

PHASE	1	2	3	4	5	6	7	8
%	0.0%	72.9%	0.0%	27.1%	15.7%	57.1%	0.0%	0.0%
sec		102		38	22	80		

R1	0	102	0	38
R2	22	80	0	0

PATTERN 7

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 8

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 9

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

PATTERN 10

	CYCLE	0		TIMING PLAN	0	RINGS IN SECONDS			
	OFFSET	0		ACTION PLAN	0	R1	0	0	0
						R2	0	0	0

PHASE	1	2	3	4	5	6	7	8
%	%	%	%	%	%	%	%	%
sec								

R1	0	0	0	0
R2	0	0	0	0

37ST@US1
10/28/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

21 TIME OF DAY

37 ST @ US#1

ACTION PLAN 11 = FLASH
ACTION PLAN 12 = FREE

ACTION PLAN 1			PATTERN		1		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 2			PATTERN		2		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 3			PATTERN		3		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 4			PATTERN		4		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X			X	X		

ACTION PLAN 5			PATTERN		5		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

ACTION PLAN 6			PATTERN		6		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL		X				X		

ACTION PLAN 7			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 8			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 9			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 10			PATTERN		0		DETECTOR PLAN	0
PHASE	1	2	3	4	5	6	7	8
RECALL								

ACTION PLAN 11	PATTERN	FLASH	DETECTOR PLAN	0

ACTION PLAN 12	PATTERN	FREE	DETECTOR PLAN	0

37ST@US1
10/28/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 21
Intersection Name: 37 ST @ US#1

DAY PLAN 1

EVENT	PLAN	TIME
1	1	7:15
2	2	9:00
3	3	15:45
4	12	19:30
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 2

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 3

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 4

EVENT	PLAN	TIME
1	4	7:15
2	5	9:00
3	6	15:45
4	12	19:30
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 5

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

DAY PLAN 6

EVENT	PLAN	TIME
1	12	0:00
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

WEEK PLAN 1	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	ALL WEEKS
BASE DAY	3	4	4	4	4	4	2	WEEKS	

WEEK PLAN 2	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

WEEK PLAN 3	SUN	MON	TUE	WED	THU	FRI	SAT	ACTIVE	
BASE DAY								WEEKS	

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

EXCEPTION DAY IMPLEMENT FOR YEAR SEE HOLIDAY TIME SHEET

DAY	EVENT	FIXED / FLOAT	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1	LABOR DAY	FLOAT	9	2	1	2
2	VETERAN'S DAY	FIXED	11	11	0	2
3	THANKSGIVING	FLOAT	11	5	4	3
4	CHRISTMAS	FIXED	12	25	0	3
5	NEW YEAR'S	FIXED	1	1	0	3
6	MEMORIAL DAY	FLOAT	5	2	5	2
7	4 OF JULY	FIXED	7	4	0	2
8						
9						
10						
11						
12						

PROGRAM LOGIC

37ST@US1
10/28/2021

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 149 Controller Type: ASC 3

Intersection Name: Aviation Blvd @ 27 Avenue Date: 03/03/20

SecFDOT yell

PHASE	1	2	3	4	5	6	7	8
APPROACH		WB	NB	SB	WBLT	EB		
INITIAL		20	10	10	5	20		
PASSAGE		4	4	4	3	4		
YELLOW		4	3.7	3.7	3.7	4		
ALL RED		2	2.1	2	2	2		
MAX 1		60	30	30	25	60		
MAX 2		60	30	45	25	60		
WALK								
PED CLEAR								
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON LOCK			X	X	X			
CNA 1		X				X		

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	
PHASE						
TIMING						

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2-6	YES	YES	YES	2-6	4
				5		

REMOVED NIGHT FLASH 03/03/20 DETECTOR DELAY: PHASE4 = 10 SEC. PHASE 5=5 SEC.

MAX 3 = PHASE 4 ONLY ADJUST = 10 SEC. MAXOUTS = 1 GAPS = 2

Season

pm System Cycle 0 TIMING BY: J.ANKENY

Free Cycle 168.2

SYC APPROVED BY:

GIS

AVIATION@27AVE.xls
5/19/2022

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

Intersection Number: 210 Controller Type: ASC 3

Intersection Name: Aviation & Administration Date: 03/03/20

SecFDOT yell

PHASE	1	2	3	4	5	6	7	8
APPROACH		WB		NB	WBLT	EB		
INITIAL		20		6	5	20		
PASSAGE		4		4	3	4		
YELLOW		4.4		3.7	3.7	4.4		
ALL RED		2		2.3	2.2	2		
MAX 1		45		20	18	45		
MAX 2		60		20	18	60		
WALK								
PED CLEAR								
MIN RECALL		X				X		
MAX RECALL								
PED RECALL								
NON LOCK				X	X			
CNA 1		X				X		

PRE-EMPTION TIMING	GREEN BEFORE	TRCK CL GREEN	TRCK CL YELL	MIN DWELL	YELL AFTER	
PHASE						
TIMING						

SPECIAL FUNCTION	START PHASE	DUAL ENTRY	INT+ PASS	DETECT. SWITCH	OUT OF FLASH	INTO FLASH
	2+6	NO	YES	NO	2+6	4
			ALL			

REMOVED NIGHT FLASH 03/03/20

No Coordination initially Max 2 queue detector logic.

Season

pm System Cycle 0 TIMING BY: J.ANKENY

Free Cycle 77.4

SYC APPROVED BY:

AVIATION@ADMIN..xls
5/23/2022

Indian River County
Traffic Engineering
Traffic Signal Timing Sheet

EXCEPTION DAY IMPLEMENT FOR YEAR SEE HOLIDAY TIME SHEET

DAY	EVENT	FIXED / FLOAT	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

PROGRAM LOGIC

QUEUE DETECTION

1	IF DETECTOR 9 IS ON
	OR DETECTOR 10 IS ON
	AND PHASE 2 IS RED
	AND PHASE 6 IS RED
	THEN SET LOGIC FLAG 1 ON
2	IF LOGIC FLAG 1 IS ON
	THEN SET MAX 2 RING (1&2) ON
3	IF NEXT HASE IS 4
	THEN SET LOGIC FLAG 1 OFF

APPENDIX D

(Existing Intersection LOS Results)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	494	6	57	3	3	1	76	1076	3	3	1119	416
Future Volume (veh/h)	494	6	57	3	3	1	76	1076	3	3	1119	416
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	600	0	0	3	3	1	83	1170	3	3	1216	452
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, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	682	358	0	5	5	2	167	2410	6	292	1494	538
Arrive On Green	0.19	0.00	0.00	0.01	0.01	0.01	0.03	0.66	0.66	0.58	0.58	0.58
Sat Flow, veh/h	3506	1841	0	753	753	251	1781	3636	9	478	2560	922
Grp Volume(v), veh/h	600	0	0	7	0	0	83	572	601	3	832	836
Grp Sat Flow(s),veh/h/ln	1753	1841	0	1758	0	0	1781	1777	1869	478	1777	1704
Q Serve(g_s), s	23.3	0.0	0.0	0.6	0.0	0.0	2.5	22.4	22.4	0.4	51.3	56.1
Cycle Q Clear(g_c), s	23.3	0.0	0.0	0.6	0.0	0.0	2.5	22.4	22.4	11.7	51.3	56.1
Prop In Lane	1.00		0.00	0.43		0.14	1.00		0.00	1.00		0.54
Lane Grp Cap(c), veh/h	682	358	0	12	0	0	167	1178	1239	292	1037	995
V/C Ratio(X)	0.88	0.00	0.00	0.58	0.00	0.00	0.50	0.49	0.49	0.01	0.80	0.84
Avail Cap(c_a), veh/h	977	513	0	110	0	0	255	1178	1239	292	1037	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.90	0.90	0.90	0.85	0.85	0.85
Uniform Delay (d), s/veh	54.8	0.0	0.0	69.3	0.0	0.0	26.7	11.7	11.7	17.4	22.8	23.8
Incr Delay (d2), s/veh	6.7	0.0	0.0	38.0	0.0	0.0	2.1	1.3	1.2	0.1	5.6	7.4
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(95%),veh/ln	16.4	0.0	0.0	0.7	0.0	0.0	2.8	13.0	13.6	0.1	28.4	30.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.5	0.0	0.0	107.4	0.0	0.0	28.7	13.0	13.0	17.5	28.5	31.2
LnGrp LOS	E	A	A	F	A	A	C	B	B	B	C	C
Approach Vol, veh/h		600			7			1256			1671	
Approach Delay, s/veh		61.5			107.4			14.0			29.8	
Approach LOS		E			F			B			C	

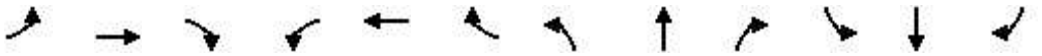
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.1	88.5		7.2		99.6		33.3				
Change Period (Y+Rc), s	* 6.3	6.8		* 6.2		6.8		6.0				
Max Green Setting (Gmax), s	* 12	55.2		* 8.8		73.2		39.0				
Max Q Clear Time (g_c+I1), s	4.5	58.1		2.6		24.4		25.3				
Green Ext Time (p_c), s	0.1	0.0		0.0		8.9		2.0				

Intersection Summary			
HCM 6th Ctrl Delay		29.7	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	34	39	8	26	18	70	939	10	11	1059	37
Future Volume (veh/h)	140	34	39	8	26	18	70	939	10	11	1059	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	126	45	9	30	21	81	1092	12	13	1231	43
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	153	160	136	16	54	60	670	2664	29	169	1206	42
Arrive On Green	0.09	0.09	0.09	0.04	0.04	0.04	0.35	0.74	0.74	0.69	0.69	0.69
Sat Flow, veh/h	1753	1841	1560	420	1400	1560	1781	3601	40	511	3503	122
Grp Volume(v), veh/h	102	126	45	39	0	21	81	539	565	13	624	650
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1820	0	1560	1781	1777	1863	511	1777	1848
Q Serve(g_s), s	7.9	9.4	3.8	2.9	0.0	1.8	0.1	15.8	15.8	2.0	48.2	48.2
Cycle Q Clear(g_c), s	7.9	9.4	3.8	2.9	0.0	1.8	0.1	15.8	15.8	17.9	48.2	48.2
Prop In Lane	1.00		1.00	0.23		1.00	1.00		0.02	1.00		0.07
Lane Grp Cap(c), veh/h	153	160	136	70	0	60	670	1315	1379	169	612	636
V/C Ratio(X)	0.67	0.79	0.33	0.55	0.00	0.35	0.12	0.41	0.41	0.08	1.02	1.02
Avail Cap(c_a), veh/h	275	289	245	429	0	368	670	1315	1379	169	612	636
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	0.00	1.00	1.00	1.00	1.00	0.37	0.37	0.37
Uniform Delay (d), s/veh	61.9	62.6	60.1	66.1	0.0	65.6	29.8	6.8	6.8	21.6	21.8	21.8
Incr Delay (d2), s/veh	5.0	8.2	1.4	6.6	0.0	3.4	0.1	0.9	0.9	0.3	27.3	27.2
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(95%),veh/ln	6.7	8.4	2.8	2.7	0.0	1.4	3.3	9.9	10.3	0.4	21.5	22.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	70.8	61.5	72.7	0.0	69.0	29.9	7.7	7.7	21.9	49.1	49.0
LnGrp LOS	E	E	E	E	A	E	C	A	A	C	F	F
Approach Vol, veh/h		273			60			1185			1287	
Approach Delay, s/veh		67.8			71.4			9.2			48.8	
Approach LOS		E			E			A			D	

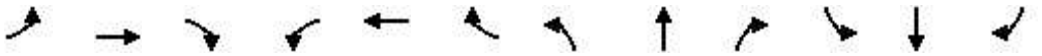
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	55.4	55.0		11.4		110.4		18.2				
Change Period (Y+Rc), s	6.8	* 6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	11.6	* 48		33.0		48.2		22.0				
Max Q Clear Time (g_c+I1), s	2.1	50.2		4.9		17.8		11.4				
Green Ext Time (p_c), s	0.1	0.0		0.2		8.8		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		34.4	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	385	5	135	5	1	4	72	865	3	1	1112	488
Future Volume (veh/h)	385	5	135	5	1	4	72	865	3	1	1112	488
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	296	198	152	6	1	4	81	972	3	1	1249	548
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	392	216	166	9	2	6	120	2293	7	281	1349	562
Arrive On Green	0.22	0.22	0.22	0.01	0.01	0.01	0.01	0.21	0.21	0.55	0.55	0.55
Sat Flow, veh/h	1753	966	741	919	153	613	1781	3634	11	577	2446	1018
Grp Volume(v), veh/h	296	0	350	11	0	0	81	475	500	1	889	908
Grp Sat Flow(s),veh/h/ln	1753	0	1707	1685	0	0	1781	1777	1868	577	1777	1687
Q Serve(g_s), s	22.1	0.0	28.0	0.9	0.0	0.0	2.6	32.5	32.5	0.1	62.8	73.1
Cycle Q Clear(g_c), s	22.1	0.0	28.0	0.9	0.0	0.0	2.6	32.5	32.5	21.6	62.8	73.1
Prop In Lane	1.00		0.43	0.55		0.36	1.00		0.01	1.00		0.60
Lane Grp Cap(c), veh/h	392	0	381	17	0	0	120	1121	1179	281	980	931
V/C Ratio(X)	0.76	0.00	0.92	0.66	0.00	0.00	0.67	0.42	0.42	0.00	0.91	0.98
Avail Cap(c_a), veh/h	426	0	415	106	0	0	208	1121	1179	281	980	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.93	0.93	0.93	0.74	0.74	0.74
Uniform Delay (d), s/veh	50.8	0.0	53.1	69.1	0.0	0.0	34.8	33.3	33.3	25.4	28.1	30.5
Incr Delay (d2), s/veh	7.0	0.0	24.1	36.0	0.0	0.0	6.0	1.1	1.0	0.0	10.6	20.1
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(95%),veh/ln	15.8	0.0	20.8	1.0	0.0	0.0	3.2	22.2	23.2	0.0	36.3	42.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	0.0	77.2	105.1	0.0	0.0	40.8	34.4	34.4	25.4	38.7	50.6
LnGrp LOS	E	A	E	F	A	A	D	C	C	C	D	D
Approach Vol, veh/h		646			11			1056			1798	
Approach Delay, s/veh		68.3			105.1			34.9			44.7	
Approach LOS		E			F			C			D	

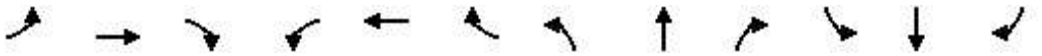
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.1	84.0		7.6		95.1		37.3				
Change Period (Y+Rc), s	* 6.3	6.8		* 6.2		6.8		6.0				
Max Green Setting (Gmax), s	* 12	60.2		* 8.8		78.2		34.0				
Max Q Clear Time (g_c+I1), s	4.6	75.1		2.9		34.5		30.0				
Green Ext Time (p_c), s	0.1	0.0		0.0		7.8		1.2				

Intersection Summary			
HCM 6th Ctrl Delay		46.3	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	37	58	16	23	7	42	875	16	10	1126	64
Future Volume (veh/h)	110	37	58	16	23	7	42	875	16	10	1126	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	96	63	17	25	8	46	951	17	11	1224	70
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, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	123	129	109	27	39	57	691	2711	48	205	1201	69
Arrive On Green	0.07	0.07	0.07	0.04	0.04	0.04	0.36	0.76	0.76	0.70	0.70	0.70
Sat Flow, veh/h	1753	1841	1560	730	1074	1560	1781	3572	64	581	3417	195
Grp Volume(v), veh/h	80	96	63	42	0	8	46	473	495	11	636	658
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1804	0	1560	1781	1777	1859	581	1777	1835
Q Serve(g_s), s	6.2	7.2	5.5	3.2	0.0	0.7	0.0	12.2	12.2	1.3	49.2	49.2
Cycle Q Clear(g_c), s	6.2	7.2	5.5	3.2	0.0	0.7	0.0	12.2	12.2	13.5	49.2	49.2
Prop In Lane	1.00		1.00	0.40		1.00	1.00		0.03	1.00		0.11
Lane Grp Cap(c), veh/h	123	129	109	66	0	57	691	1349	1411	205	624	645
V/C Ratio(X)	0.65	0.75	0.58	0.63	0.00	0.14	0.07	0.35	0.35	0.05	1.02	1.02
Avail Cap(c_a), veh/h	238	250	212	464	0	401	691	1349	1411	205	624	645
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	0.00	1.00	1.00	1.00	1.00	0.19	0.19	0.19
Uniform Delay (d), s/veh	63.4	63.9	63.1	66.5	0.0	65.3	28.8	5.5	5.5	18.5	20.8	20.8
Incr Delay (d2), s/veh	5.7	8.3	4.8	9.6	0.0	1.1	0.0	0.7	0.7	0.1	20.5	20.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.4	6.6	4.2	3.0	0.0	0.5	1.8	7.9	8.2	0.3	18.8	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.2	72.1	67.9	76.1	0.0	66.4	28.8	6.3	6.2	18.6	41.3	41.7
LnGrp LOS	E	E	E	E	A	E	C	A	A	B	F	F
Approach Vol, veh/h		239			50			1014			1305	
Approach Delay, s/veh		70.0			74.5			7.3			41.3	
Approach LOS		E			E			A			D	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	57.1	56.0		11.1		113.1		15.8				
Change Period (Y+Rc), s	6.8	* 6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	10.6	* 49		36.0		49.2		19.0				
Max Q Clear Time (g_c+I1), s	2.0	51.2		5.2		14.2		9.2				
Green Ext Time (p_c), s	0.0	0.0		0.2		7.5		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									

Notes

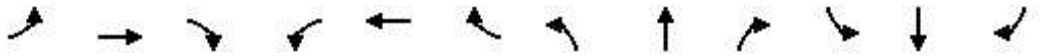
User approved volume balancing among the lanes for turning movement.

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	516	183	1088	88	50	1095
Future Volume (veh/h)	516	183	1088	88	50	1095
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	600	213	1265	102	58	1273
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	672	308	2104	169	270	2511
Arrive On Green	0.20	0.20	0.63	0.63	0.03	0.71
Sat Flow, veh/h	3401	1560	3425	268	1781	3647
Grp Volume(v), veh/h	600	213	673	694	58	1273
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1822	1781	1777
Q Serve(g_s), s	24.1	17.8	31.5	31.7	1.5	22.9
Cycle Q Clear(g_c), s	24.1	17.8	31.5	31.7	1.5	22.9
Prop In Lane	1.00	1.00		0.15	1.00	
Lane Grp Cap(c), veh/h	672	308	1123	1151	270	2511
V/C Ratio(X)	0.89	0.69	0.60	0.60	0.22	0.51
Avail Cap(c_a), veh/h	763	350	1123	1151	416	2511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	54.7	52.2	15.3	15.3	12.2	9.4
Incr Delay (d2), s/veh	11.9	4.9	2.0	2.0	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.0	21.8	18.5	19.0	1.1	13.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	66.6	57.1	17.3	17.3	12.6	10.1
LnGrp LOS	E	E	B	B	B	B
Approach Vol, veh/h	813		1367			1331
Approach Delay, s/veh	64.1		17.3			10.2
Approach LOS	E		B			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		105.7		34.3	10.5	95.2
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		95.2		31.4	16.0	73.2
Max Q Clear Time (g_c+I1), s		24.9		26.1	3.5	33.7
Green Ext Time (p_c), s		14.3		1.6	0.1	13.3

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	302	218	194	274	3	157	0	146	0	0	34
Future Volume (veh/h)	0	302	218	194	274	3	157	0	146	0	0	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	364	0	234	330	4	189	0	0	0	0	41
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	817		554	1094	13	229	0		0	0	111
Arrive On Green	0.00	0.44	0.00	0.10	0.60	0.60	0.13	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1815	22	1753	189		0	0	1560
Grp Volume(v), veh/h	0	364	0	234	0	334	189	45.3		0	0	41
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	D		0	0	1560
Q Serve(g_s), s	0.0	12.3	0.0	6.1	0.0	7.9	9.4			0.0	0.0	2.2
Cycle Q Clear(g_c), s	0.0	12.3	0.0	6.1	0.0	7.9	9.4			0.0	0.0	2.2
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	817		554	0	1107	229			0	0	111
V/C Ratio(X)	0.00	0.45		0.42	0.00	0.30	0.82			0.00	0.00	0.37
Avail Cap(c_a), veh/h	0	817		765	0	1107	473			0	0	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.3	0.0	11.4	0.0	8.6	37.9			0.0	0.0	39.7
Incr Delay (d2), s/veh	0.0	1.8	0.0	0.5	0.0	0.7	7.3			0.0	0.0	2.0
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
%ile BackOfQ(95%),veh/ln	0.0	9.2	0.0	4.0	0.0	5.5	7.9			0.0	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.0	0.0	11.9	0.0	9.3	45.3			0.0	0.0	41.7
LnGrp LOS	A	B		B	A	A	D			A	A	D
Approach Vol, veh/h		364	A		568						41	
Approach Delay, s/veh		19.0			10.4						41.7	
Approach LOS		B			B						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		60.0	17.5	12.1	14.2	45.8						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		54.0	* 24	* 39	* 19	29.0						
Max Q Clear Time (g_c+I1), s		9.9	11.4	4.2	8.1	14.3						
Green Ext Time (p_c), s		2.2	0.4	0.2	0.5	1.9						

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

Notes

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

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	440	37	41	472	26	34
Future Volume (veh/h)	440	37	41	472	26	34
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	506	43	47	543	30	39
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	670	420	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.60	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	506	43	47	543	30	39
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	10.1	0.8	0.6	7.7	0.7	1.0
Cycle Q Clear(g_c), s	10.1	0.8	0.6	7.7	0.7	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	670	420	1114	226	201
V/C Ratio(X)	0.64	0.06	0.11	0.49	0.13	0.19
Avail Cap(c_a), veh/h	1407	1192	790	2118	527	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.5	7.8	7.1	5.2	18.0	18.1
Incr Delay (d2), s/veh	0.9	0.0	0.1	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.0	0.4	0.3	3.3	0.5	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.3	7.8	7.3	5.5	18.2	18.6
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	549			590	69	
Approach Delay, s/veh	11.1			5.6	18.4	
Approach LOS	B			A	B	

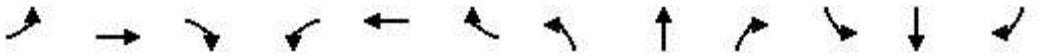
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		53.6		14.0	12.1	35.6
Max Q Clear Time (g_c+I1), s		9.7		3.0	2.6	12.1
Green Ext Time (p_c), s		4.1		0.1	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	161	76	1196	504	204	1332
Future Volume (veh/h)	161	76	1196	504	204	1332
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	175	83	1300	548	222	1448
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	245	113	1822	726	250	2957
Arrive On Green	0.07	0.07	0.73	0.73	0.05	0.83
Sat Flow, veh/h	3401	1560	2575	988	1781	3647
Grp Volume(v), veh/h	175	83	909	939	222	1448
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1692	1781	1777
Q Serve(g_s), s	7.0	7.3	39.0	46.3	5.2	16.2
Cycle Q Clear(g_c), s	7.0	7.3	39.0	46.3	5.2	16.2
Prop In Lane	1.00	1.00		0.58	1.00	
Lane Grp Cap(c), veh/h	245	113	1305	1243	250	2957
V/C Ratio(X)	0.71	0.74	0.70	0.76	0.89	0.49
Avail Cap(c_a), veh/h	690	316	1305	1243	432	2957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	63.5	63.7	10.1	11.1	31.5	3.3
Incr Delay (d2), s/veh	3.8	9.0	2.5	3.5	11.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.7	10.7	20.4	22.9	10.8	8.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.4	72.7	12.6	14.6	42.5	3.9
LnGrp LOS	E	E	B	B	D	A
Approach Vol, veh/h	258		1848			1670
Approach Delay, s/veh	69.1		13.6			9.0
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		123.3		16.7	13.7	109.6
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		98.2		28.4	22.0	70.2
Max Q Clear Time (g_c+I1), s		18.2		9.3	7.2	48.3
Green Ext Time (p_c), s		18.5		0.8	0.5	15.5

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	303	200	130	296	0	179	0	195	0	0	1
Future Volume (veh/h)	0	303	200	130	296	0	179	0	195	0	0	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	319	0	137	312	0	188	0	0	0	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	969		635	1203	0	231	0		0	0	4
Arrive On Green	0.00	0.53	0.00	0.06	0.65	0.00	0.13	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1841	0	1753	1841	0	1753	188		0	0	1560
Grp Volume(v), veh/h	0	319	0	137	312	0	188	41.7		0	0	1
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	1841	0	1753	D		0	0	1560
Q Serve(g_s), s	0.0	8.2	0.0	2.7	5.8	0.0	8.6			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	8.2	0.0	2.7	5.8	0.0	8.6			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	969		635	1203	0	231			0	0	4
V/C Ratio(X)	0.00	0.33		0.22	0.26	0.00	0.81			0.00	0.00	0.23
Avail Cap(c_a), veh/h	0	969		943	1203	0	514			0	0	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.2	0.0	7.6	6.0	0.0	34.9			0.0	0.0	41.1
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.2	0.5	0.0	6.8			0.0	0.0	25.7
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
%ile BackOfQ(95%),veh/ln	0.0	6.0	0.0	1.7	3.7	0.0	7.2			0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.1	0.0	7.7	6.5	0.0	41.7			0.0	0.0	66.8
LnGrp LOS	A	B		A	A	A	D			A	A	E
Approach Vol, veh/h		319	A		449						1	
Approach Delay, s/veh		12.1			6.9						66.8	
Approach LOS		B			A						E	

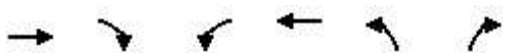
Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		60.0	16.7	5.9	10.5	49.5						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		54.0	* 24	* 24	* 19	29.0						
Max Q Clear Time (g_c+I1), s		7.8	10.6	2.1	4.7	10.2						
Green Ext Time (p_c), s		2.1	0.4	0.0	0.3	1.8						

Intersection Summary	
HCM 6th Ctrl Delay	15.5
HCM 6th LOS	B

Notes

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

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	489	40	86	428	9	14
Future Volume (veh/h)	489	40	86	428	9	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	520	43	91	455	10	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	770	653	437	1132	220	196
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	520	43	91	455	10	15
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	10.9	0.8	1.2	6.0	0.2	0.4
Cycle Q Clear(g_c), s	10.9	0.8	1.2	6.0	0.2	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	770	653	437	1132	220	196
V/C Ratio(X)	0.68	0.07	0.21	0.40	0.05	0.08
Avail Cap(c_a), veh/h	793	672	752	1486	513	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	8.3	7.5	4.7	18.4	18.5
Incr Delay (d2), s/veh	2.2	0.0	0.2	0.2	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.2	0.4	0.6	2.5	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.5	8.4	7.7	4.9	18.5	18.6
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	563			546	25	
Approach Delay, s/veh	13.1			5.4	18.6	
Approach LOS	B			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.8		12.0	9.4	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		38.6		14.0	12.1	20.6
Max Q Clear Time (g_c+I1), s		8.0		2.4	3.2	12.9
Green Ext Time (p_c), s		3.1		0.0	0.1	2.1
Intersection Summary						
HCM 6th Ctrl Delay			9.5			
HCM 6th LOS			A			

APPENDIX E

(Existing Crash Data)

State of Florida Department of Transportation
CRASH SUMMARY

SECTION: 88010000 STATE ROUTE: 5

ROADWAY LIMITS: From 26th Street to 37th Street M.P. 6.782 TO 7.853 ENGINEER: GOAL Associates Inc.

STUDY PERIOD: FROM 1/ 2017 TO 12/ 2017 COUNTY: Indian River

Crash Number	No.	MILE POST	DATE	DAY	TIME	CRASH TYPE	FATAL	INJURIES	PROP DAM	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE (VEHICLE ONLY)
873858010	1	2.564	11/17/17	Sat	1654	Not Coded	0	0	1	Night	Dry	Not Coded
873855080	2	2.748	07/14/17	Sat	2244	Not Coded	0	1	0	Night	Dry	Not Coded
873856560	3	2.898	09/24/17	Mon	2248	Not Coded	0	0	1	Night	Dry	Not Coded
873857640	4	6.782	11/03/17	Fri	1809	Rear-End	0	1	0	Day	Dry	Other Contributing Action
865717470	5	6.794	02/11/17	Sat	1700	Angle	0	0	1	Day	Dry	Ran Red Light
873858210	6	6.794	11/21/17	Tue	1615	Sideswipe	0	0	1	Day	Dry	No Contributing Action
865717770	7	6.830	02/24/17	Fri	1138	Rear-End	0	0	1	Day	Dry	Careless or Negligent Manner
865721260	8	6.851	07/06/17	Thu	1205	Rear-End	0	0	1	Day	Dry	Careless or Negligent Manner
873858960	9	6.899	12/22/17	Fri	1134	Rear-End	0	0	1	Day	Dry	No Contributing Action
873857650	10	7.017	11/04/17	Sat	0451	Head-On	0	1	0	Night	Dry	No Contributing Action
865716580	11	7.090	01/17/17	Tue	1316	Left-Turn	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
865718340	12	7.150	03/13/17	Mon	1709	Angle	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
873856490	13	7.174	09/20/17	Wed	1143	Sideswipe	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
865721380	14	7.217	07/12/17	Wed	1043	Left-Turn	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
865718950	15	7.240	04/05/17	Wed	1152	Rear-End	0	0	1	Day	Dry	Careless or Negligent Manner
865719310	16	7.301	04/10/17	Mon	1612	Rear-End	0	0	1	Day	Dry	Followed too Closely
865718610	17	7.378	03/25/17	Sat	0740	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
865719470	18	7.380	04/23/17	Sun	1614	Sideswipe	0	0	1	Day	Dry	No Contributing Action
865718080	19	7.523	03/06/17	Mon	1523	Angle	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
865721030	20	7.561	06/27/17	Tue	1519	Angle	0	0	1	Day	Dry	Careless or Negligent Manner
865719550	21	7.575	04/26/17	Wed	0906	Rear-End	0	2	0	Day	Dry	Careless or Negligent Manner
873855540	22	7.609	08/10/17	Thu	1322	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
870050830	23	7.806	06/16/17	Fri	1619	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner

State of Florida Department of Transportation
CRASH SUMMARY

SECTION: 88010000 STATE ROUTE: 5

ROADWAY LIMITS: From 26th Street to 37th Street M.P. 6.782 TO 7.853 ENGINEER: GOAL Associates Inc.

STUDY PERIOD: FROM 1/ 2018 TO 12/ 2018 COUNTY: Indian River

Crash Number	No.	MILE POST	DATE	DAY	TIME	CRASH TYPE	FATAL	INJURIES	PROP DAM	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE (VEHICLE ONLY)
873863130	1	2.037	05/08/18	Wed	1708	Rear-End	0	0	1	Day	Dry	Not Coded
886448210	2	2.478	10/16/18	Wed	1447	Curb	0	1	0	Day	Dry	Not Coded
886450000	3	2.801	12/13/18	Fri	1418	Rear-End	0	0	1	Day	Dry	Not Coded
886446560	4	2.940	08/14/18	Wed	1741	Other Traffic Barrier	0	0	1	Day	Dry	Not Coded
873864380	5	6.785	07/03/18	Tue	1520	Sideswipe	0	0	1	Day	Dry	Careless or Negligent Manner
886448040	6	6.788	10/06/18	Sat	1820	Rear-End	0	0	1	Day	Dry	No Contributing Action
886446260	7	6.794	08/01/18	Wed	0737	Right-Turn	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
861476920	8	6.807	01/12/18	Fri	1450	Not Coded	0	0	1	Night	Dry	Drove too Fast for Conditions
873863370	9	6.871	05/22/18	Tue	1117	Sideswipe	0	1	0	Day	Wet	Improper Turn
886449440	10	7.141	11/21/18	Wed	1059	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
886446740	11	7.150	08/23/18	Thu	2019	Right-Turn	0	0	1	Night	Dry	Failed to Yield Right-Of-Way
873862740	12	7.170	04/30/18	Mon	1537	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
873863580	13	7.217	06/03/18	Sun	1238	Sideswipe	0	0	1	Day	Dry	Failed To Keep In Proper Lane
873862180	14	7.236	04/10/18	Tue	1455	Angle	0	0	1	Day	Wet	Careless or Negligent Manner
873861170	15	7.242	03/10/18	Sat	1020	Rear-End	0	1	0	Day	Dry	No Contributing Action
886447930	16	7.581	10/02/18	Tue	1012	Angle	0	2	0	Day	Dry	Failed to Yield Right-Of-Way
886449720	17	7.697	12/05/18	Wed	1644	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
873863160	18	7.719	05/13/18	Sun	2040	Angle	0	0	1	Night	Wet	Failed to Yield Right-Of-Way
886447020	19	7.750	09/04/18	Tue	0958	Concrete Traffic Barrier	0	1	0	Day	Dry	Careless or Negligent Manner
886448650	20	7.793	10/30/18	Tue	1509	Rear-End	0	0	1	Day	Dry	Followed too Closely
887287580	21	7.847	10/15/18	Mon	2103	Rear-End	0	2	0	Night	Dry	Careless or Negligent Manner
864605620	22	7.853	07/13/18	Fri	1106	Pedalcycle	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
887291330	23	7.853	12/03/18	Mon	1708	Rear-End	0	0	1	Night	Dry	Careless or Negligent Manner

State of Florida Department of Transportation
CRASH SUMMARY

SECTION: 88010000 STATE ROUTE: 5

ROADWAY LIMITS: From 26th Street to 37th Street M.P. 6.782 TO 7.853 ENGINEER: GOAL Associates Inc.

STUDY PERIOD: FROM 1/ 2019 TO 12/ 2019 COUNTY: Indian River

Crash Number	No.	MILE POST	DATE	DAY	TIME	CRASH TYPE	FATAL	INJURIES	PROP DAM	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE (VEHICLE ONLY)
886452540	1	2.820	03/02/19	Sun	0213	Curb	0	0	1	Night	Dry	Not Coded
886455860	2	6.794	06/19/19	Wed	1156	Angle	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
892932790	3	6.794	07/13/19	Sat	1830	Sideswipe	0	0	1	Day	Dry	Careless or Negligent Manner
892933140	4	6.794	07/28/19	Sun	2328	Angle	0	2	0	Night	Dry	Not Coded
886456080	5	6.796	07/02/19	Tue	0703	Angle	0	1	0	Day	Dry	Ran Red Light
886451850	6	6.804	02/11/19	Mon	0943	Rear-End	0	0	1	Day	Dry	Followed too Closely
886454890	7	6.834	05/12/19	Sun	1815	Other Post, Pole Or Support	0	1	0	Night	Wet	Careless or Negligent Manner
886456210	8	6.944	07/07/19	Sun	1347	Left-Turn	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
892936740	9	6.944	12/27/19	Fri	1626	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
886456070	10	7.005	07/01/19	Mon	0915	Angle	0	0	1	Day	Dry	Improper Turn
892935070	11	7.090	10/28/19	Mon	2000	Pedestrian	0	1	0	Night	Dry	Failed to Yield Right-Of-Way
886452070	12	7.118	02/18/19	Mon	1448	Sideswipe	0	0	1	Day	Dry	No Contributing Action
886453850	13	7.145	04/09/19	Tue	1605	Rear-End	0	0	1	Day	Dry	Followed too Closely
886455600	14	7.181	06/06/19	Thu	1630	Rear-End	0	0	1	Day	Dry	Followed too Closely
892936540	15	7.189	12/22/19	Sun	2331	Other Fixed Object	0	1	0	Night	Wet	Other Contributing Action
886451770	16	7.217	02/07/19	Thu	1410	Not Coded	0	0	1	Day	Dry	Not Coded
886454380	17	7.217	04/24/19	Wed	2116	Angle	0	0	1	Night	Dry	Other Contributing Action
886451380	18	7.242	01/26/19	Sat	1247	Rear-End	0	0	1	Day	Dry	Followed too Closely
887294600	19	7.268	01/12/19	Sat	1944	Not Coded	0	0	1	Night	Dry	Ran Off Roadway
892937010	20	7.300	12/23/19	Mon	1725	Rear-End	0	1	0	Night	Dry	Followed too Closely
892933060	21	7.313	07/24/19	Wed	1455	Rear-End	0	0	1	Day	Wet	No Contributing Action
892935650	22	7.324	11/20/19	Wed	1809	Rear-End	0	1	0	Night	Dry	Careless or Negligent Manner
886450620	23	7.328	01/03/19	Thu	1205	Rear-End	0	0	1	Day	Dry	Careless or Negligent Manner
886454390	24	7.330	04/25/19	Thu	1710	Rear-End	0	0	1	Day	Dry	Not Coded
886453360	25	7.334	03/26/19	Tue	1156	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
892933350	26	7.341	08/07/19	Wed	1559	Rear-End	0	1	0	Day	Wet	Drove too Fast for Conditions
892935150	27	7.474	11/02/19	Sat	1940	Sideswipe	0	0	1	Night	Dry	Improper Passing
886450830	28	7.536	01/08/19	Tue	1808	Angle	0	0	1	Night	Dry	Not Coded
886451600	29	7.614	02/01/19	Fri	1230	Rear-End	0	0	1	Day	Dry	Followed too Closely
886450710	30	7.629	01/06/19	Sun	1340	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
886455700	31	7.719	06/10/19	Mon	1208	Right-Turn	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
892333230	32	7.719	06/04/19	Tue	0743	Angle	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
892337570	33	7.719	08/15/19	Thu	1456	Angle	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
892935950	34	7.756	12/02/19	Mon	0730	Rear-End	0	2	0	Day	Wet	Other Contributing Action
880148290	35	7.853	05/28/19	Tue	1000	Angle	1	1	0	Day	Dry	Failed to Yield Right-Of-Way
887297570	36	7.853	02/20/19	Wed	0855	Rear-End	0	2	0	Day	Dry	Followed too Closely
887300200	37	7.853	03/26/19	Tue	0852	Rear-End	0	0	1	Day	Dry	Careless or Negligent Manner
887303660	38	7.853	05/12/19	Sun	1914	Rear-End	0	1	0	Day	Wet	Followed too Closely
892333210	39	7.853	06/03/19	Mon	1541	Rear-End	0	0	1	Day	Dry	Followed too Closely
892333800	40	7.853	06/14/19	Fri	0722	Rear-End	0	1	0	Day	Dry	Followed too Closely
892346190	41	7.853	12/12/19	Thu	1231	Left-Turn	0	0	1	Day	Wet	Ran Red Light

State of Florida Department of Transportation
CRASH SUMMARY

SECTION: 88010000 STATE ROUTE: 5

ROADWAY LIMITS: From 26th Street to 37th Street M.P. 6.782 TO 7.853 ENGINEER: GOAL Associates Inc.

STUDY PERIOD: FROM 1/ 2020 TO 12/ 2020 COUNTY: Indian River

Crash Number	No.	MILE POST	DATE	DAY	TIME	CRASH TYPE	FATAL	INJURIES	PROP DAM	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE (VEHICLE ONLY)
241215160	1	6.794	08/29/20	Sat	1056	Rear-End	0	1	0	Day	Dry	Followed too Closely
241215350	2	6.794	09/04/20	Fri	1342	Angle	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
241215620	3	6.794	09/23/20	Wed	1418	Angle	0	0	1	Day	Dry	Ran Red Light
892940740	4	6.794	07/02/20	Thu	1235	Embankment	0	0	1	Day	Dry	Followed too Closely
892939820	5	6.920	05/12/20	Tue	1648	Rear-End	0	1	0	Day	Dry	Followed too Closely
241215860	6	6.941	10/01/20	Thu	1411	Angle	0	1	0	Day	Dry	Failed to Yield Right-Of-Way
892938280	7	7.217	02/20/20	Thu	1944	Left-Turn	0	3	0	Night	Dry	Careless or Negligent Manner
241217150	8	7.234	12/08/20	Tue	1228	Rear-End	0	1	0	Day	Dry	Careless or Negligent Manner
241217140	9	7.286	12/08/20	Tue	1241	Sideswipe	0	0	1	Day	Dry	Improper Passing
892941180	10	7.532	07/28/20	Tue	0810	Other Fixed Object	0	0	1	Day	Dry	Exceed Posted Speed
892940250	11	7.650	01/11/20	Sat	1731	Rear-End	0	0	1	Day	Dry	Followed too Closely
892348160	12	7.719	01/10/20	Fri	1122	Rear-End	0	0	1	Day	Dry	Followed too Closely
892939740	13	7.719	04/30/20	Thu	1710	Angle	0	0	1	Day	Dry	Not Coded
900003030	14	7.719	03/12/20	Thu	1726	Angle	0	0	1	Day	Dry	Failed to Yield Right-Of-Way
892938810	15	7.790	03/04/20	Wed	0930	Sideswipe	0	2	0	Day	Dry	Failed To Keep In Proper Lane
892347790	16	7.853	01/03/20	Fri	1516	Sideswipe	0	0	1	Day	Dry	Other Contributing Action
892348050	17	7.853	01/08/20	Wed	1606	Not Coded	0	0	1	Day	Dry	Improper Backing
892348950	18	7.853	01/23/20	Thu	1651	Rear-End	0	1	0	Day	Dry	Followed too Closely
892350400	19	7.853	02/12/20	Wed	0843	Sideswipe	0	0	1	Day	Dry	Careless or Negligent Manner
900007320	20	7.853	06/05/20	Fri	1415	Rear-End	0	0	1	Day	Wet	No Contributing Action
900010830	21	7.853	08/07/20	Fri	1122	Rear-End	0	0	1	Day	Dry	Followed too Closely
900013940	22	7.853	09/24/20	Thu	1721	Rear-End	0	0	1	Day	Dry	Followed too Closely

State of Florida Department of Transportation
CRASH SUMMARY

SECTION: 88010000 STATE ROUTE: 5

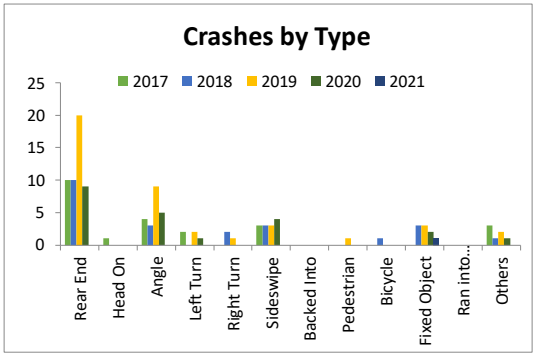
ROADWAY LIMITS: From 26th Street to 37th Street M.P. 6.782 TO 7.853 ENGINEER: GOAL Associates Inc.

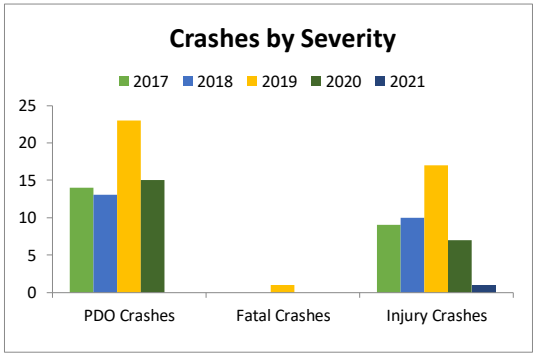
STUDY PERIOD: FROM 1/ 2021 TO 12/ 2021 COUNTY: Indian River

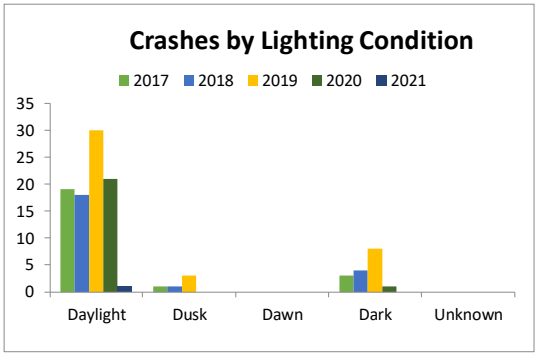
Crash Number	No.	MILE POST	DATE	DAY	TIME	CRASH TYPE	FATAL	INJURIES	PROP DAM	DAY / NIGHT	WET / DRY	CONTRIBUTING CAUSE (VEHICLE ONLY)
243149550	1	7.062	03/10/21	Wed	0941	Tree (Standing)	0	1	0	Day	Dry	Ran Off Roadway

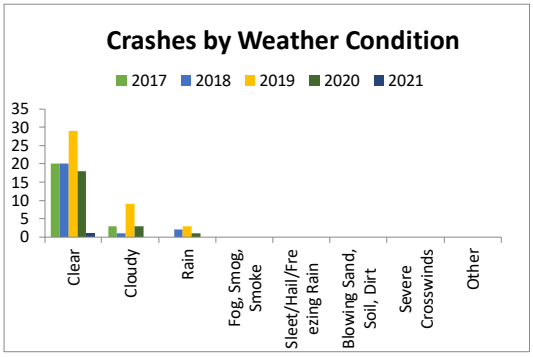
CRASH HISTOGRAMS

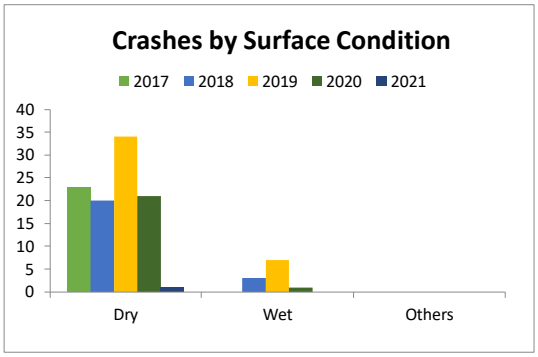
SR 5/US-1 at Aviation Boulevard

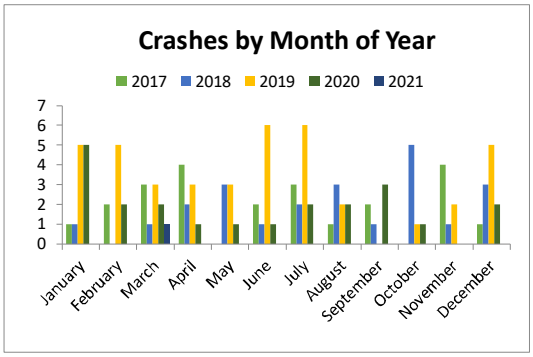


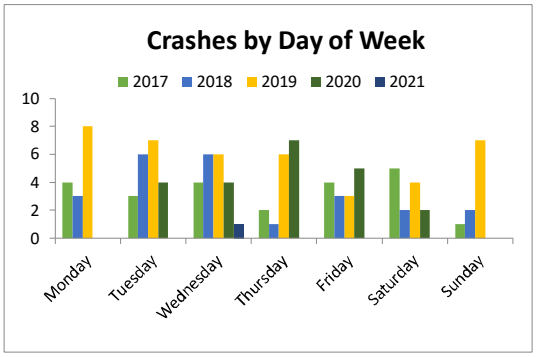


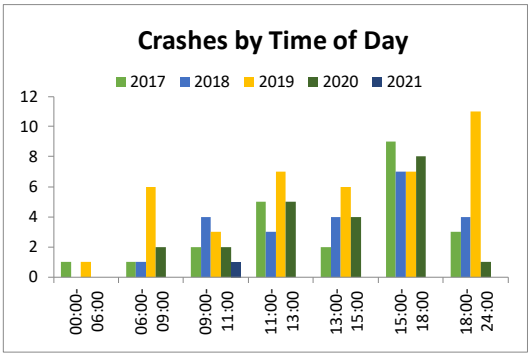












APPENDIX F

(Intersection Control Evaluation (ICE) Report)

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INTERSECTION CONTROL EVALUATION (ICE) STUDY
STAGE 1 TECHNICAL MEMORANDUM

SR 5/US-1 at Aviation Boulevard
Project Development and Environment (PD&E) Study

Indian River County, Florida | FM# 441693-1-22-02 | ETDM Number:14475

Prepared for

FDOT

Florida Department of Transportation - District Four
Fort Lauderdale, Florida

April 2023

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INTERSECTION CONTROL EVALUATION (ICE) STUDY STAGE 1 TECHNICAL MEMORANDUM

Florida Department of Transportation

District Four

SR 5/US-1 at Aviation Boulevard

Project Development and Environment (PD&E) Stud

Limits of Project: From 21st Street to 41st Street

Indian River County, Florida

Financial Management Number: 441693-1-22-02

ETDM Number: 14475

Date: April 25, 2023

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration (FHWA) and FDOT.

Godfrey Lamptey

Digitally signed by Godfrey Lamptey
Date: 2023.07.07 12:02:18-04'00'

Authorized Signature

Godfrey Lamptey, P.E., PTOE
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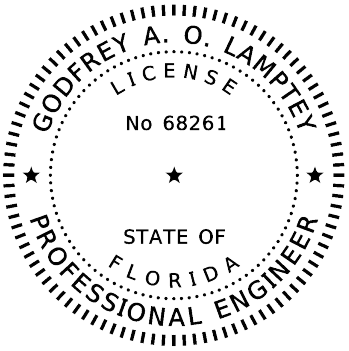
Address

Miami Lakes, FL, 33016
Address



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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The project intersection of SR 5/US-1 and Aviation Boulevard is located within the urbanized area of the City of Vero Beach in Indian River County, Florida. This is a 4-legged, signalized intersection that accommodates the Florida East Coast (FEC) Railroad at-grade crossing along the west leg of the intersection. The FEC Railroad, which is part of the Strategic Intermodal System (SIS) Railroad Corridor, includes double-tracks running north-south parallel to SR 5/US-1 on the west side. Pedestrian crosswalks are provided on the northbound and westbound approaches of the intersection. There are no dedicated bicycle facilities. Nearby landmarks include Vero Beach Regional Airport, Cleveland Clinic, Indian River Hospital and Indian River Medical Center, and downtown Vero Beach. The intersection is near a Runway Protection Zone (RPZ) of the Vero Beach Regional Airport.

The project proposes operational and capacity improvements to the intersection of SR 5/US-1 and Aviation Boulevard/32nd Street. Various alternatives will be considered during the Project Development & Environment (PD&E) study, which may include a grade-separated crossing over the FEC Railroad. Additional features were considered such as multi-modal improvements. The project study area includes SR-5/US-1 between 21st Street and 41st Street; and along Aviation Boulevard between 27th Avenue and US-1; and 32nd Street from US 1 to 13th Avenue.

SR 5/US-1 constitutes the north and south approaches of the intersection, as a four-lane divided facility with a painted center turn-lane, curb and gutter on both sides, and a sidewalk on the east side. SR 5/US-1 has a functional classification of Urban Principal Arterial Other and a context classification of Suburban Commercial and Urban General since there are mostly non-residential land uses along the corridor with residential neighborhood connections. Indian River County has designated SR 5/US-1 corridor as a hurricane evacuation route.

At the west leg of the intersection, Aviation Boulevard crosses the FEC Railroad. This is a 2-lane undivided roadway with no pedestrian facilities. Aviation Boulevard has a functional classification of Urban Minor Arterial and a context classification of Suburban Commercial due to the non-residential land uses. 32nd Street forms the east leg of the intersection as a local 2 lane undivided street serving limited commercial and residential properties.

The county is currently evaluating extending Aviation Boulevard east from US-1 to the Cleveland Clinic Hospital. The proposed extension would connect the intersection of US-1 at Aviation Boulevard directly to 37th Street, go along the west perimeter of the hospital campus and extend north of 37th Street to 41st Street.

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1.2 PURPOSE AND NEED

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.

The primary need of the project is to alleviate existing and future traffic congestion by providing improvements that meet future travel demand and capacity. According to the Indian River County Metropolitan Planning Organization (MPO) 2021 Priority Projects Report, the intersection is currently failing or nearly failing during peak periods and in peak directions. Based on the existing 2021 traffic volumes obtained as part of this study, Aviation Boulevard just west of SR 5/US-1 is operating with a LOS E with an Annual Average Daily Traffic (AADT) of 12,000. SR 5/US-1 south of Aviation Boulevard is operating at LOS C with an AADT of 26,500. SR 5/US-1 north of Aviation Boulevard is operating at LOS F with an AADT of 34,200.

The future traffic demand is projected to increase due to population and employment growth as well as planned capacity improvements in the immediate network; therefore, conditions are expected to worsen at this intersection without any improvements. Along SR 5/US-1 south of Aviation Boulevard, the AADT projected to increase by 63% from 26,500 in 2021 to 43,200 in the 2045 design year. To the north of Aviation Boulevard, the AADT along SR 5/US-1 is projected to increase by 34% from 34,200 in 2021 to 45,800 in the 2045 design year. Along Aviation Boulevard, the AADT is anticipated to increase by 70% from 12,000 in the 2021 to 20,400 in the 2045 design year.

The project also aims at improving safety at the intersection. The 2021 Florida Strategic Highway Safety Plan (FSHSP) has identified intersections as an emphasis area while rail crossings are an evolving emphasis area. A historical crash evaluation of the intersection of SR 5/US-1 and Aviation Boulevard revealed a total of 21 crashes observed over a five-year period between 2017 and 2021. Approximately 32% of these crashes resulted in injuries. The majority of these crashes were rear end at approximately 41% followed by angle and left turn crashes combined at 23% and sideswipe at 18%. These types of crashes may be correlated to congested conditions at the intersection. The existing facility's safety performance crash rate was calculated at 0.92 which is significantly higher than the Statewide crash rate of 0.53 and the Districtwide crash rate of 0.34. This indicates a potential safety concern. The SR 5/US-1 corridor has been designated by Indian River County as an evacuation route.

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1.3 PROJECT LOCATION

The intersection of SR 5/US-1 at Aviation Boulevard is located in Indian River County. The project study area includes SR-5/US-1 between 21st Street and 41st Street; and along Aviation Boulevard between 27th Avenue and US-1; and 32nd Street from US 1 to 13th Avenue. However, the traffic study limits extend from 26th Street to 37th Street along SR 5/US-1 and from 27th Avenue to SR 5/US-1, along Aviation Boulevard. The traffic study area is depicted in **Figure 1-1**

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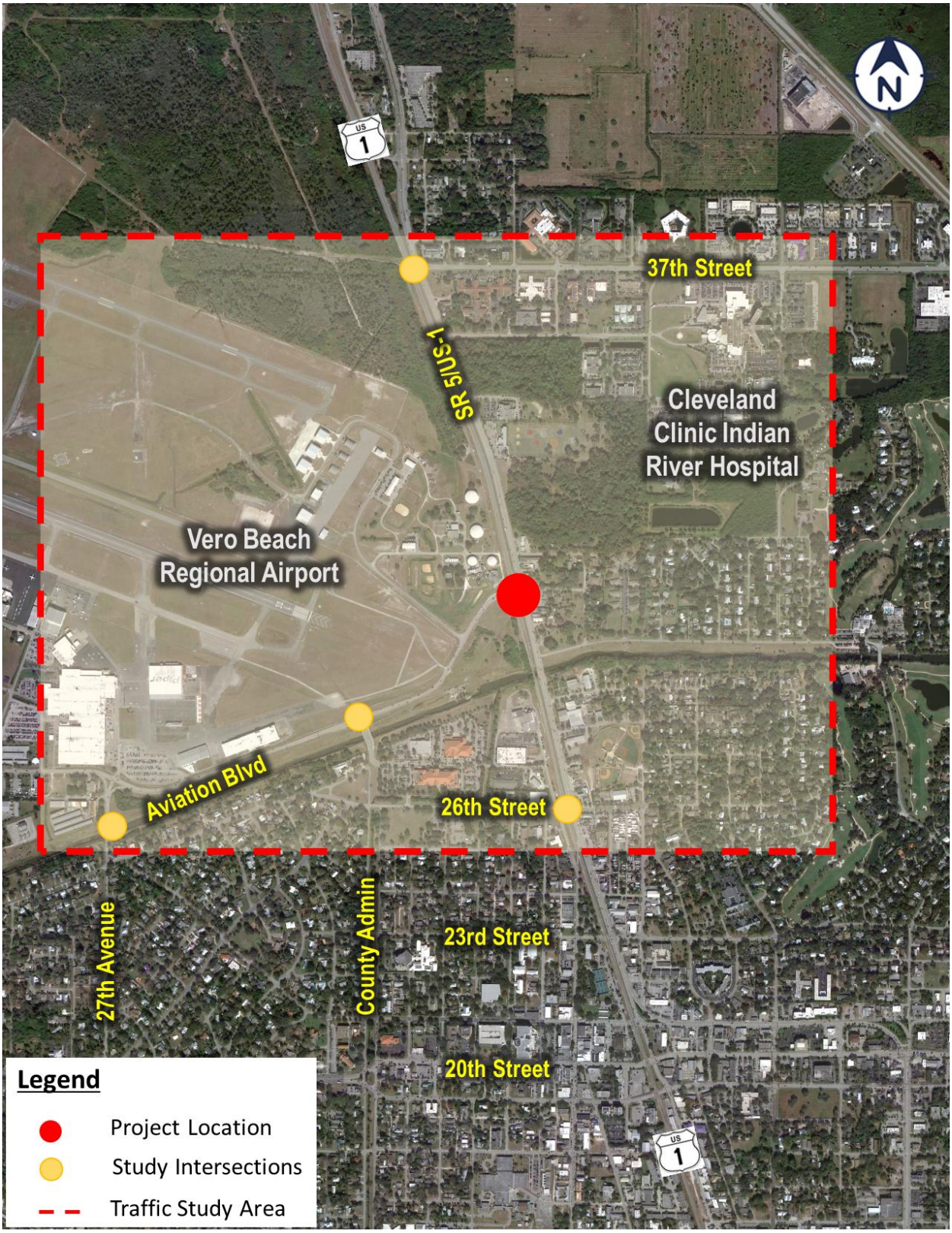

Figure 1-1 Traffic Study Area

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2.0 INTERSECTION CONTROL EVALUATION (ICE) - STAGE 1 ANALYSIS

Intersection Control Evaluation (ICE) is a process used to consider multiple context-sensitive intersection control strategies when planning a new or modified intersection. The goal of ICE is to provide a quantitative decision-making process to identify and select a control strategy that fits the location's context, provides safe travel facilities for all road users, and offers the best overall value. As part of the PD&E Study, an ICE analysis was performed for the intersection of SR 5/US-1 and Aviation Boulevard.

The ICE Stage 1 involves two analysis components: 1) A planning level volume-to-capacity (V/C) ratio assessment using the Capacity Analysis at Junctions (CAP-X) tool; and 2) a planning level safety assessment using Safety Performance for Intersection Control Evaluation (SPICE). These assessments are high level in nature, due to the potentially numerous intersection control types that need to be reviewed during the ICE Stage 1 evaluation. **Figure 2-1** shows the flow chart for ICE Stage 1. The completed FDOT ICE Stage 1 Form is provided in **Appendix A**.

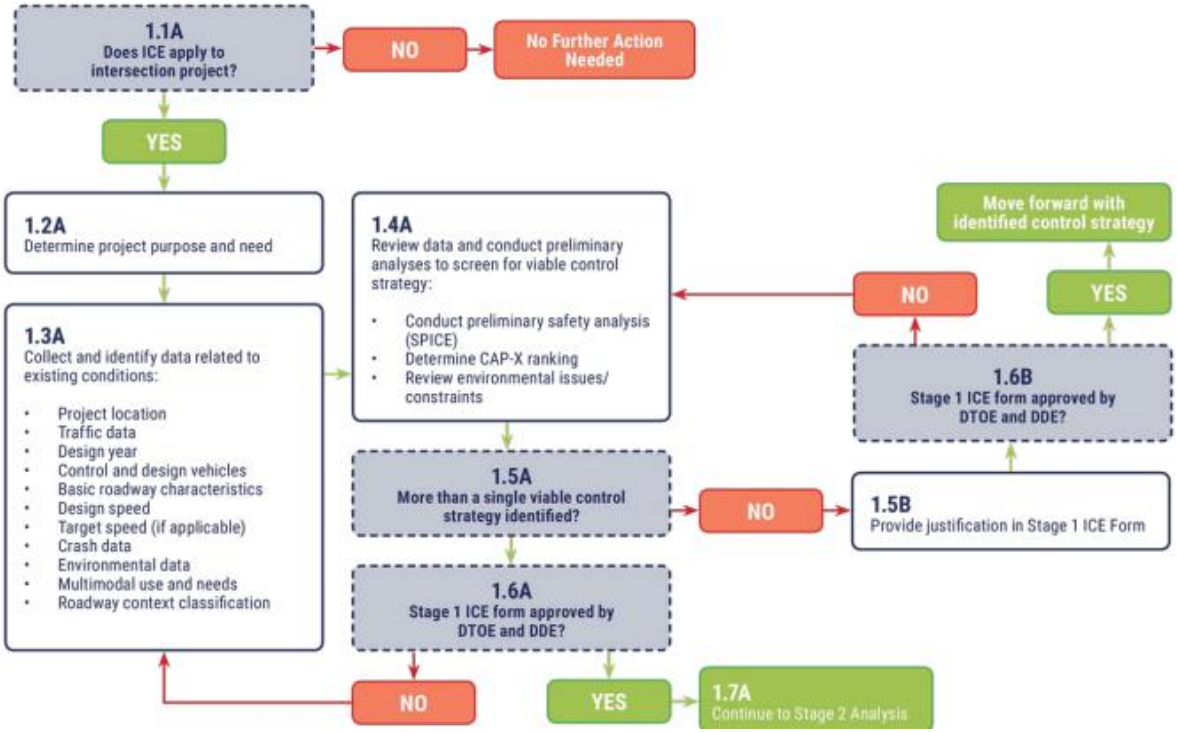

Figure 2-1 ICE Stage 1 Process Chat

If the Stage 1 evaluation results in only one control strategy that meets the purpose and need of the project and it is a viable solution, then no further analysis is required. However, if multiple control strategies are viable and need further examination, then further evaluation is required.

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2.1 ROADWAY AND INTERSECTION GEOMETRY

The intersection of SR 5/US-1 at Aviation Boulevard is a signalized intersection with following lane configuration:

- Northbound SR 5/US-1: Two through lanes and one exclusive left turn lane
- Southbound SR 5/US-1: Two through lanes and one exclusive left turn lane
- Eastbound Aviation Boulevard: One through-left-right shared lane and one exclusive left turn lane.
- Westbound Aviation Boulevard: One shared through-left-right turn lane

2.2 POSTED SPEED LIMITS

SR 5/US-1 within the study limits has a posted speed of 45-mph while Aviation Boulevard generally has a 40-mph posted speed limit. However, there is a 25-mph advisory speed limit for the reverse curve just west of the SR 5/US-1 intersection.

2.3 FUNCTIONAL CLASSIFICATION

SR 5/US-1 is a National Highway System roadway functionally classified as an Urban Principal Arterial Other while Aviation Boulevard is functionally classified as an Urban Minor Arterial. The roadway section ID numbers are as follows:

- SR 5/US-1 Roadway ID: 88010000
- Aviation Boulevard Roadway ID: 88000024

2.4 EXISTING AND FUTURE LAND USE

The area surrounding the SR 5/US-1 at Aviation Boulevard intersection is designated as Incorporated Municipality within the City of Vero Beach as shown in **Figure *2-2***. The surrounding land uses include medical district, single and multi-family uses and general commercial uses. Beginning

2.5 TYPICAL SECTIONS

The typical section along SR 5/US-1 consists of a 4-lane undivided roadway with a painted median. Dedicated left-turn lanes are provided at the Aviation Boulevard intersection. The typical section along Aviation Boulevard consists of a two-lane undivided roadway with exclusive left turn lane for the eastbound movement.

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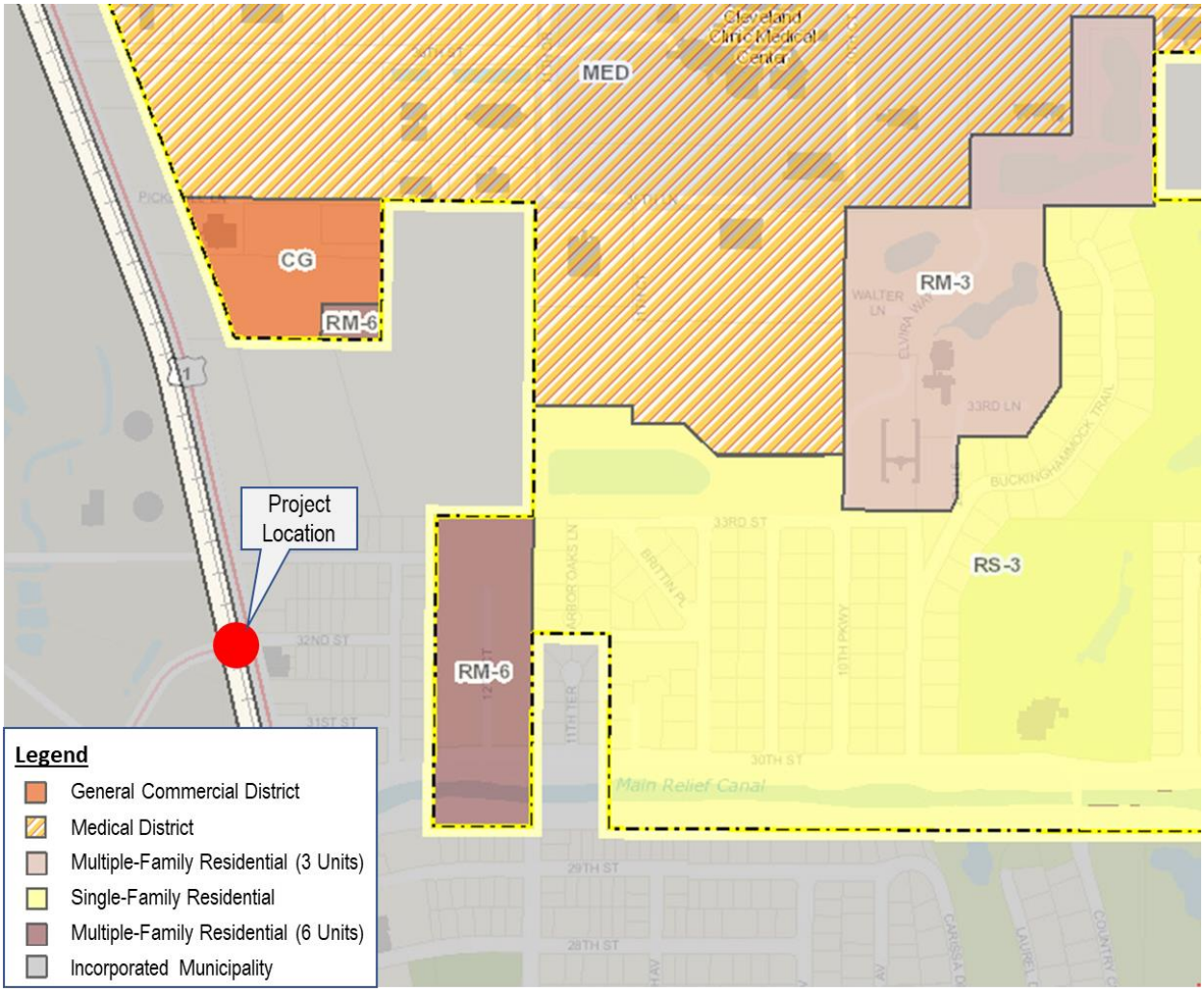

Figure 2-2 Indian River County GIS Zoning Map

2.6 MULTIMODAL USE AND NEED

There are no bicycle lanes provided along SR 5/US-1; however, there is a 5-foot sidewalk on the east side of SR 5/US-1. Along Aviation Boulevard, there are no sidewalks or bicycle lanes within the project limits.

2.7 LIGHTING

There are conventional light poles located along the west side of SR 5/US-1, between the buffer area separating the roadway from the railroad. There is no lighting along Aviation Boulevard.

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2.8 ANALYSIS YEARS

The analysis years for the operational analysis were established as follows.

- Existing year: 2021
- Opening year: 2025
- Design year: 2045

2.9 EXISTING AND FUTURE TRAFFIC VOLUMES

2.9.1 Annual Average Daily Traffic (AADT) Volumes

The Average Daily Traffic (ADT) volume was estimated as the average of the 72-hour Approach or Arterial ADT Counts. The existing Annual Average Daily Traffic (AADT) volumes was computed by applying the seasonal factor (SF) and axle factor (AF). The future year AADT volumes were obtained by applying an areawide compound rate of 2.0%. This growth rate was calculated by averaging each of the rates obtained from different forecasting methods. The detailed traffic forecast analysis is documented under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. **Figure 2-3** shows the existing and future build condition (including Aviation Blvd Extension) AADT volumes obtained for the various roadway segments within the study area.

2.9.2 Intersection Turning Movement Volumes (TMV)

TMTOOL was used to forecast the turning movement volumes for the study intersections for the AM and PM peak hours using the traffic factors and forecasted AADTs. Projected turns were smoothed and balanced to within a +/- 7 percent tolerance level. The TMTOOL spreadsheets are provided in the *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. For this ICE analysis, the turning movement volumes for the future build condition during the AM and PM peak hours for only the study intersections are summarized in **Figure 2-4** and **Figure 2-5**. It should be noted that the future build condition includes the Aviation Blvd Extension project current under evaluation by Indian River County.

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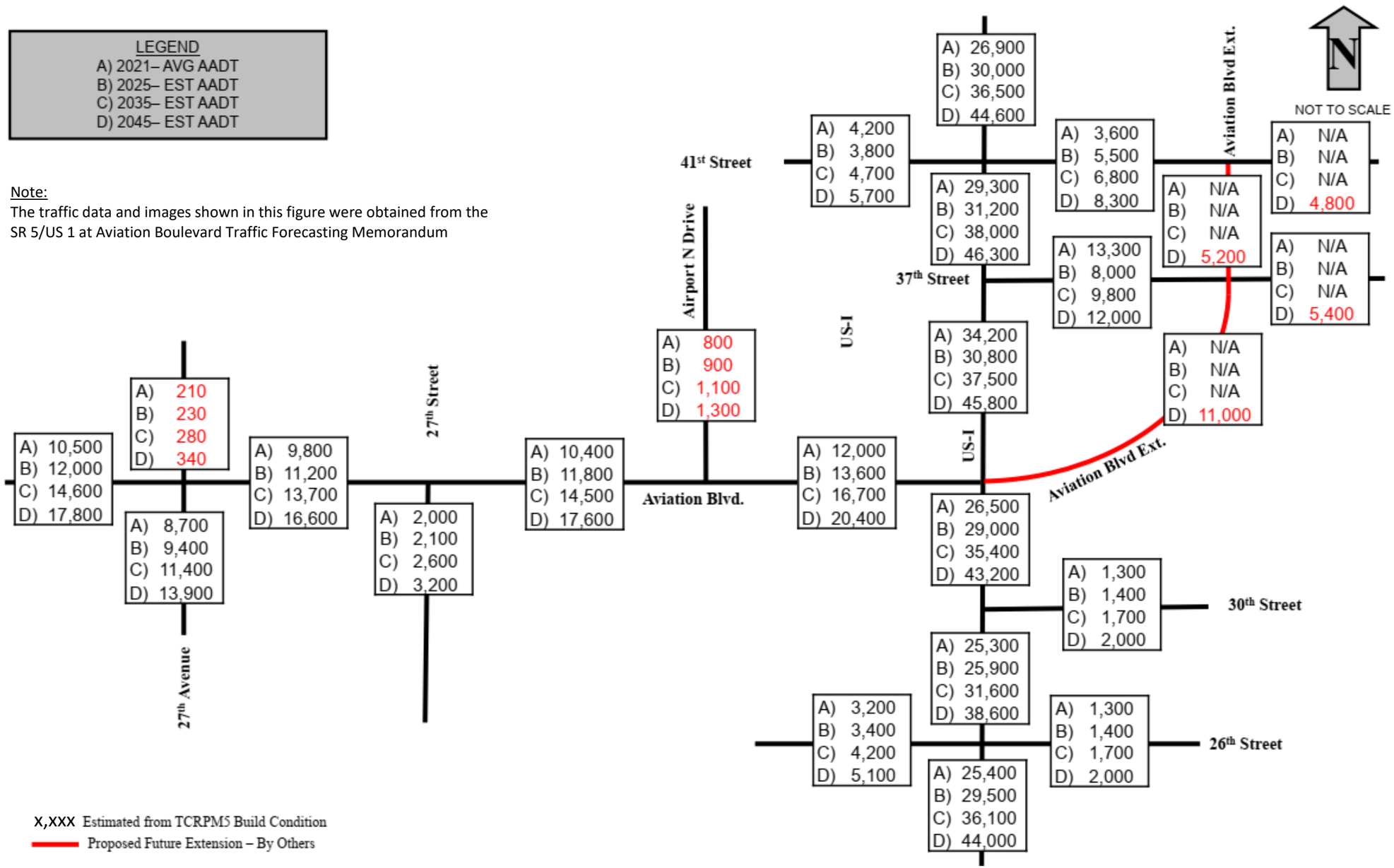

Figure 2-3 Existing and Future Build Condition Annual Average Daily Traffic (AADT) Volumes

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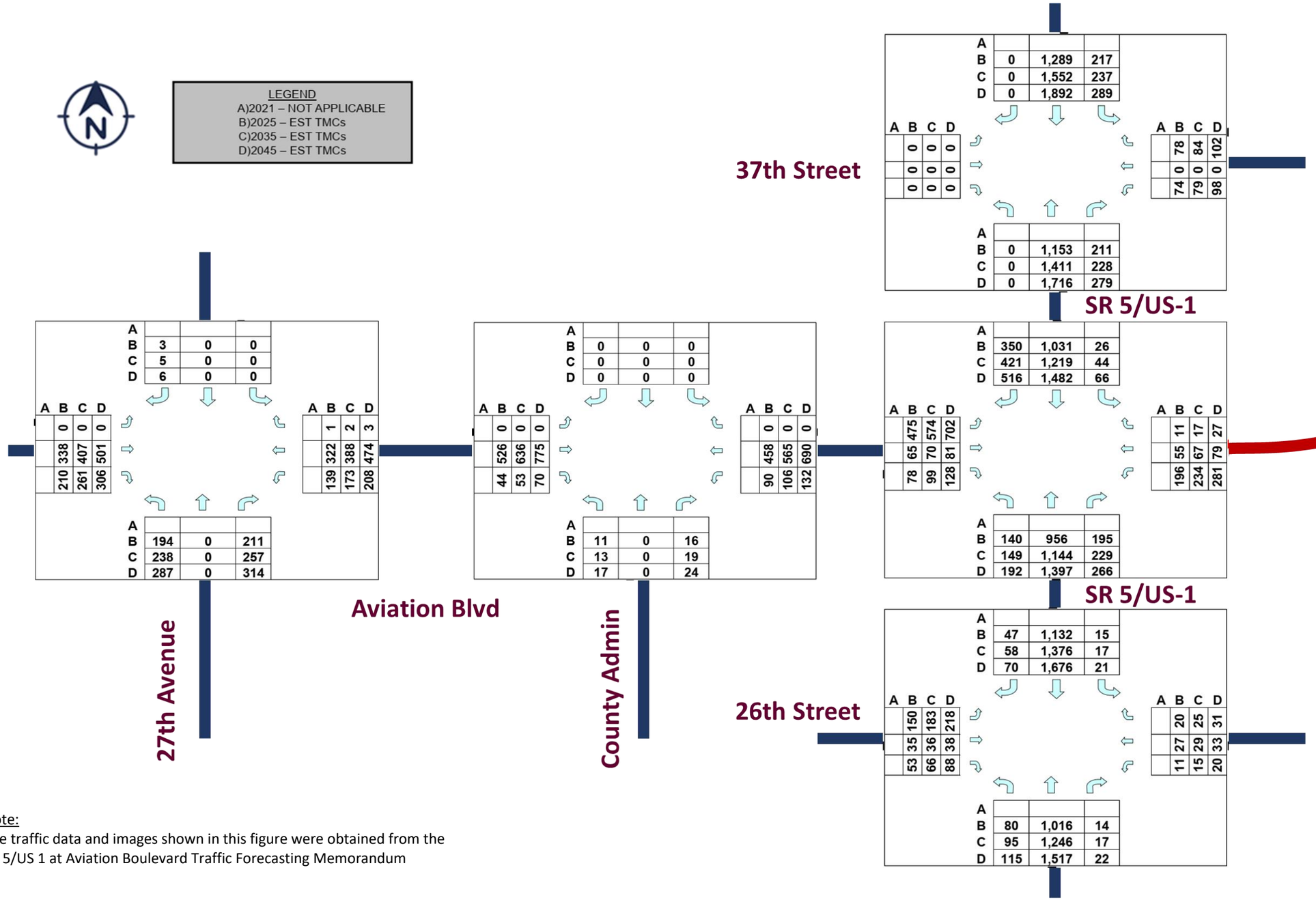

Note:
The traffic data and images shown in this figure were obtained from the SR 5/US 1 at Aviation Boulevard Traffic Forecasting Memorandum

Figure 2-4 Future Build Condition Intersection Turning Movement Volumes – AM Peak

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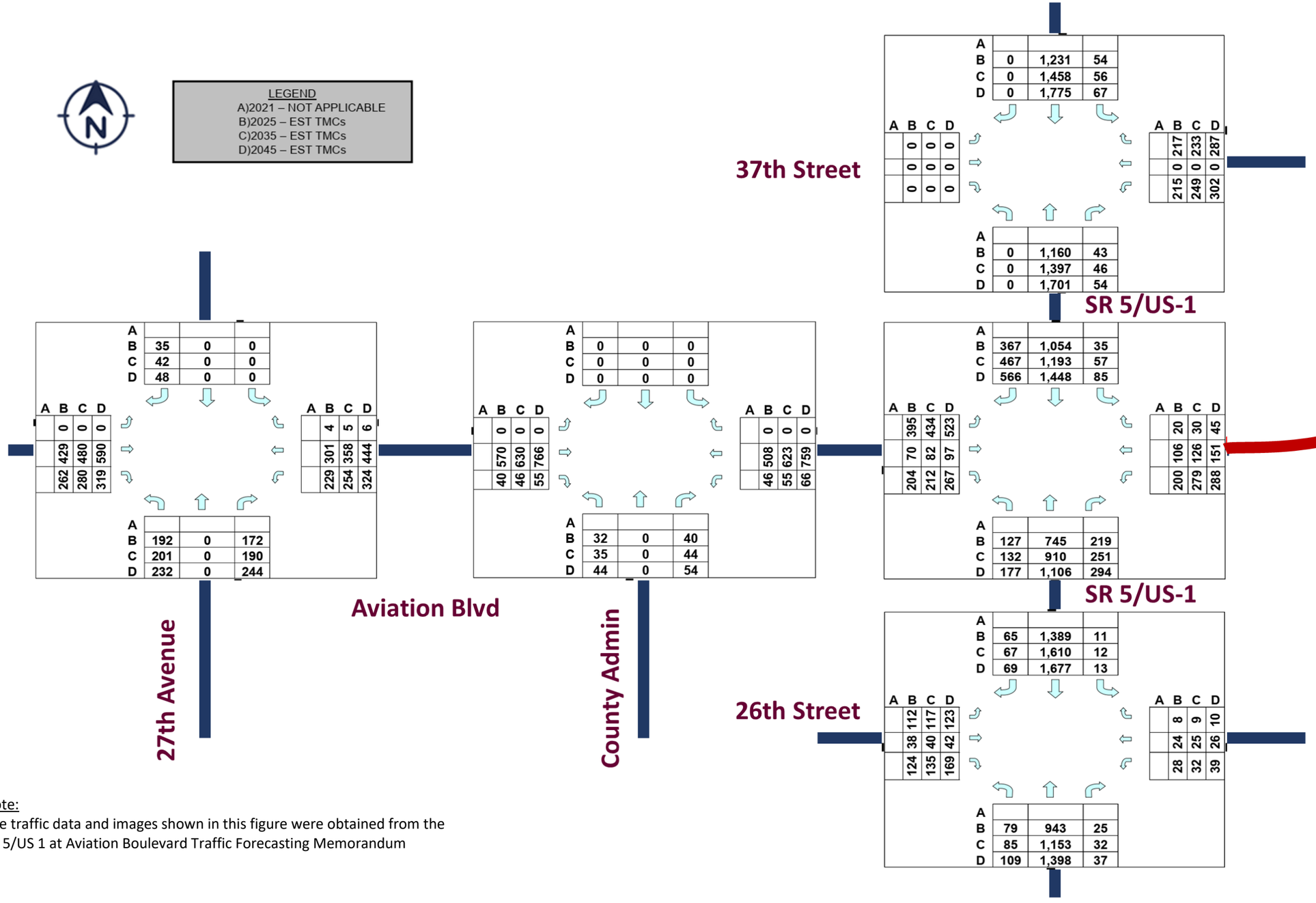

Note:
The traffic data and images shown in this figure were obtained from the SR 5/US 1 at Aviation Boulevard Traffic Forecasting Memorandum

Figure 2-5 Future Build Condition Intersection Turning Movement Volumes – PM Peak

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2.10 CAP-X TOOLS ANALYSIS AND RESULTS

The FDOT expanded version of the FHWA Capacity Analysis for Planning of Junctions (CAP-X) tool was used to evaluate various types of innovative intersection designs. The CAP-X tool is based on the operational analysis using the critical lane method to evaluate selected types of innovative intersection designs. The following intersection control types were evaluated as part of the ICE Stage evaluation 1 for the study intersection.

- Traffic Signal
- Displaced Left Turn
- Partial Displaced Left Turn
- Median U-Turn
- Signalized Restricted Crossing U-Turn (R-CUT)
- 2 X 2 Roundabout
- Signalized Thru-Cut
- Quadrant Roadway
- Single Point Grade Separation

Each control type was compared operationally using a planning level volume-to-capacity (V/C) ratio based on the 2045 design year traffic volumes. **Table 2-1** and **Table *2-2*** below show the results for the AM and PM Peak periods respectively. The detailed CAP-X analysis results are shown in **Appendix B**.

Table 2-1 CAP-X Analysis Results (AM Peak Period)

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Pedestrian Accommodations	Bicycle Accommodations
Single Point E-W	0.62	1	3.10	3.67
Quadrant Roadway S-E	0.69	2	4.66	4.58
Partial Displaced Left Turn N-S	0.70	3	2.95	3.29
Traffic Signal	0.79	4	4.90	4.62
Quadrant Roadway N-E	0.82	5	4.67	4.58
Median U-Turn N-S	0.82	5	3.00	4.58
Displaced Left Turn	0.87	7	3.10	3.91
Signalized ThruCut N-S	1.05	8	3.87	4.67
Signalized Restricted Crossing U-Turn N-S	1.16	9	3.09	4.32
2 X 2	3.27	10	4.50	4.50

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Table 2-2 CAP-X Analysis Results (PM Peak Period)

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Pedestrian Accommodations	Bicycle Accommodations
Single Point E-W	0.51	1	3.08	3.67
Quadrant Roadway S-E	0.70	2	4.66	4.58
Partial Displaced Left Turn N-S	0.70	2	2.93	3.29
Displaced Left Turn	0.75	4	3.09	3.91
Median U-Turn N-S	0.78	5	3.00	4.58
Quadrant Roadway N-E	0.79	6	4.65	4.58
Traffic Signal	0.84	7	4.90	4.62
Signalized ThruCut N-S	0.95	8	3.85	4.67
Signalized Restricted Crossing U-Turn N-S	1.13	9	3.09	4.32
2 X 2	2.42	10	4.42	4.50

2.11 SPICE TOOL ANALYSIS AND RESULTS

The FDOT expanded version of FHWA's Safety Performance of Intersection Control Evaluations (SPICE) tool was used to rank the control strategies selected for the CAP-X tool. It should be noted that the SPICE Tool does not include the Partial Displaced Left Turn, Partial Median U-Turn, Quadrant Roadway, and Single Point Grade Separation control strategies. As such, they were not evaluated in the SPICE analysis.

The SPICE tool ranks the safety performance of each alternative based upon a predicted number of total and fatal/injury crashes based upon the design year (2045) traffic volumes. A safety ranking of 1 denotes a lower predicted number of fatal/injury crashes while a higher ranking denotes a higher predicted number of fatal/injury crashes when compared to the other alternatives.

The SPICE tool also includes the Safe System for Intersections (SSI) analytical methodology. The Safe System is a human centered approach that involves the management and design of the road system such that impact energy on the human body is firstly avoided or secondly managed at tolerable levels by manipulating speed, mass, and crash angles to reduce crash injury severity.

Table 3-1 below shows the results for the SPICE rankings. The detailed SPICE analysis results are shown in **Appendix C**. The existing crash intersection crash data is provided in **Appendix D**.

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Table 2-3 SPICE Analysis Results

Project Information			
Project Name:	SR 5/US-1 at Aviation Boulevard PD&E Study	Intersection Type	At-Grade Intersection
Intersection:	SR 5/US-1 & Aviation Boulevard	Opening Year	2025
Agency:	FDOT District 4	Design Year	2045
Project Reference:	FM# 441693-1-22-02 | ETDM Number 14475	Facility Type	On Urban and Suburban Arterial
City:	Vero Beach	Number of Legs	4-leg
State:	Florida	1-Way/2-Way	2-way Intersecting 2-way
Date:	5/10/2022	# of Major Street Lanes (both directions)	5 or fewer
Analyst:	GOAL Associates	Major Street Approach Speed	Less than 55 mph

Crash Prediction Summary								SSI Score		
Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	6.10	10.12	169.63	3	Yes	Calibrated SPF	77	62	3
	Fatal & Injury	2.52	4.28	70.98						
2-lane Roundabout	Total	17.94	28.51	486.54	4	No	Uncalibrated SPF	79	69	2
	Fatal & Injury	3.38	5.64	94.30						
Displaced Left Turn (DLT)	Total	5.37	8.91	149.27	2	N/A	CMF	43	25	6
	Fatal & Injury	2.21	3.77	62.47						
Median U-Turn (MUT)	Total	5.19	8.60	144.18	1	N/A	CMF	84	76	1
	Fatal & Injury	1.76	3.00	49.69						
Signalized RCUT	Total	15.17	28.04	449.14	5	No	Uncalibrated SPF	74	61	4
	Fatal & Injury	5.22	10.11	158.84						
Signalized Thru-Cut	Total	No SPF	No SPF	No SPF	--	N/A	N/A	72	55	5
	Fatal & Injury	No SPF	No SPF	No SPF						

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3.0 CONCLUSIONS AND RECOMMENDATIONS

Table 3-1 provides a comparison of the results from the ICE Stage 1 analysis.

Table 3-1 Summary of ICE Stage I Analysis

Control Strategy	V/C Ratio		Ped Accom.	Bike Accom.	Predicted Crashes/Year		V/C Rank	Crash Prediction Rank	SSI Rank
	AM	PM			Total	Fatal/ Injury			
Single Point Grade Separation	0.62	0.51	3.10	3.67	N/A	N/A	1	N/A	N/A
Quadrant Roadway (S-E)	0.69	0.70	4.66	4.58	N/A	N/A	2	N/A	N/A
Partial Displaced Left Turn	0.70	0.70	2.95	3.29	N/A	N/A	3	N/A	N/A
Median U-Turn	0.82	0.78	3.00	4.58	8	3	4	1	1
Quadrant Roadway (N-E)	0.82	0.79	4.67	4.58	N/A	N/A	5	N/A	N/A
Displaced Left Turn	0.87	0.75	3.10	3.91	8	4	6	2	6
Traffic Signal	0.79	0.84	4.90	4.62	9	4	7	3	3
Signalized Thru-Cut	1.05	0.95	3.87	4.67	N/A	N/A	8	N/A	5
Signalized R-CUT	1.16	1.13	3.09	4.32	23	8	9	5	4
2 X 2 Roundabout	3.27	2.42	4.50	4.50	25	5	10	4	2

From a capacity standpoint, the highest ranked strategies include the Single Point Grade Separation, Quadrant Roadway, Partial Displaced Left Turn and Median U-Turn control strategies. As shown in the table above, the Signalized Thru-Cut, Signalized R-CUT and Roundabout control strategies have V/C ratios greater than 1 which indicates that these control strategies cannot accommodate the traffic demand for this intersection to meet the purpose and need for this project. Although the full Displaced Left Turn has a V/C ratio less than 1; however, the reverse curve and the railroad crossing on the west leg present challenging geometry and constraints for this control strategy.

The SPICE tool does not provide safety analysis for the Partial Displaced Left Turn, Quadrant Roadway, and Single Point Grade Separation control strategies which were among the highest ranked from the capacity analysis. For the remaining strategies, the highest ranked from a crash prediction perspective include the Median U-turn followed by the Displaced Left Turn, and the Traffic Signal. Although the Displaced Left Turn strategy was ranked as number 2 based on crash prediction, it was ranked number 6 when considering the SSI approach.

In terms of multimodal accommodation, i.e., pedestrian and bicycle features, the highest ranked strategy is the at-grade traffic signal followed by the quadrant roadways control strategies. The

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partial displaced left turn and the full displaced left turn and grade separation control strategies are the least ranked for multimodal accommodations.

Based the preliminary safety and capacity analysis evaluation as well as the multimodal accommodation, the following intersection control strategies are recommended to be further evaluated during the PD&E Study Alternatives Evaluation Process.

1. Single Point Grade Separation (US-1 over Aviation Blvd)
2. Single Point Grade Separation (Aviation Blvd over US-1)
3. Quadrant Roadway (S-E quadrant)
4. Quadrant Roadway (N-E quadrant)
5. Partial Displaced Left Turn
6. Median U-Turn
7. Traffic Signal

Both grade separation of US-1 over Aviation Blvd and Aviation Blvd over US-1 are recommended to be further evaluated. Currently there are no grade-separated crossings over the FEC railroad within the 2-mile radius. The proposed Brightline service along the FEC corridor will increase the number of trains resulting in additional delays and safety concerns at-grade crossings. Although grade separation of the minor roadway (Aviation Blvd over US-1) does not result in significant operational improvements, it will enhance safety and emergency response across the railroad tracks to the nearby Cleveland Clinic Indian River Hospital.

The combination of these control strategies should also be evaluated to determine the optimal configuration for this intersection. The completed Intersection Control Evaluation (ICE) Form for this PD&E Study with the corresponding justifications for the various control strategies are included in **Appendix A**.

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APPENDIX A

(FDOT ICE Stage 1 Form)

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Florida Department of Transportation
Intersection Control Evaluation (ICE) Form
Stage 1: Screening

To fulfill the requirements of Stage 1 (Screening) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms are to be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval. **Selections must be made in the "Intersection Type" and "Project Funding Source" cells below for the appropriate Stage 1 and Stage 2 forms to fully populate.**

Project Name	SR 5/US-1 Aviation Boulevard PD&E Study		FDOT Project #	441693-1-22-02	
Submitted By	Godfrey Lamptey, PE, PTOE	Agency/Company	Goal Associates	Date	4/15/2023
Email	godfrey.lamptey@goalassociates.com	FDOT District	District 4	County	Indian River
Project Locality (*City/Town/Village*)	Vero Beach				
Intersection Type	At-Grade Intersection	FDOT Context Classification	C4 - Urban General		
Project Funding Source	Federal	Project Type	Congestion Mitigation Project		
Project Purpose (*What is the catalyst for this project and why is it being undertaken?*)	This PD&E study is being conducted with the purpose of evaluating intersection improvement solutions at the SR 5/US-1 and Aviation Boulevard intersection to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.				
Project Setting Description (*Describe the area surrounding the intersection*)	The surrounding land uses within the vicinity of the SR 5/US_1 and Aviation Boulevard intersection include medical district, single and multi-family uses and general commercial uses. Future land uses include mixed-use development, commercial, mixed residential, and residential medium.				
Multimodal Context (*Describe the pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development patterns*)	The intersection of SR5/US-1 and Aviation Boulevard currently serves vehicles, pedestrians (sidewalks and crosswalks), transit, and the FEC Railroad crossing at the west leg of the intersection. There are three bus routes along SR 5/US-1 and one route along Aviation Boulevard. No bicycle lanes are present in the vicinity and sidewalks are only present on the east side of SR 5/US-1. New Sidewalks and bicycle facilities in conjunction with roadway improvement projects along Aviation Boulevard between SR5/US-1 and 43rd Avenue are proposed. Bicycle facilities are also proposed along SR 5/US-1.				

Major Street Information

Route #:	SR 5/US-1	Route Name(s)	Federal Highway			Milepost	7.217
Existing Control Type	Signal		Existing AADT	34,200	Design Year AADT		45,800
Design Vehicle	Florida Interstate Semitrailer (WB-62FL)		Control Vehicle	Florida Interstate Semitrailer (WB-62FL)			
Primary Functional Classification	Urban Principal Arterial - Other				Design Speed (mph)		45
Secondary Functional Classification (if app.)					Target Speed (mph) [if app.]		40

Approach #1	Direction	Northbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along:	One side of the approach	Left-Turn	1				
	Crosswalk on Approach?	Yes	Left-Through	0	Weekday AM Peak		Weekday PM Peak	
	On-Street Bike Facilities?	No	Through	1	Left	192	Left	177
	Multi-Use Path?	No	Left-Through-Right	0	Through	1,397	Through	1,106
	Scheduled Bus Service?	Yes	Through-Right	1	Right	266	Right	294
	Bus Stop on Approach?	Yes	Right-Turn	0	Daily Truck %		4.3%	
Approach #2	Direction	Southbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along:	One side of the approach	Left-Turn	1				
	Crosswalk on Approach?	No	Left-Through	0	Weekday AM Peak		Weekday PM Peak	
	On-Street Bike Facilities?	No	Through	1	Left	66	Left	85
	Multi-Use Path?	No	Left-Through-Right	0	Through	1,482	Through	1,448
	Scheduled Bus Service?	Yes	Through-Right	1	Right	516	Right	566
	Bus Stop on Approach?	Yes	Right-Turn	0	Daily Truck %		4.3%	

Minor Street Information										
Route #:		Route Name(s)	Aviation Boulevard					Milepost (if app.)		
Existing Control Type	Signal			Existing AADT	12,000			Design Year AADT	20,400	
Design Vehicle	Florida Interstate Semitrailer (WB-62FL)			Control Vehicle	Florida Interstate Semitrailer (WB-62FL)					
Primary Functional Classification	Urban Minor Arterial							Design Speed (mph)	30	
Secondary Functional Classification (if app.)								Target Speed (mph) [if app.]	30	

Approach #1	Direction	Eastbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Neither side of the approach	Left-Turn	1					
	Crosswalk on Approach?	No	Left-Through	0	Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?	No	Through	0	Left	702	Left	523	
	Multi-Use Path?	No	Left-Through-Right	1	Through	81	Through	97	
	Scheduled Bus Service?	Yes	Through-Right	0	Right	128	Right	267	
	Bus Stop on Approach?	Yes	Right-Turn	0	Daily Truck %		7.9%		
Approach #2	Direction	Westbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Neither side of the approach	Left-Turn	0					
	Crosswalk on Approach?	Yes	Left-Through	0	Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?	No	Through	0	Left	281	Left	288	
	Multi-Use Path?	No	Left-Through-Right	1	Through	79	Through	151	
	Scheduled Bus Service?	Yes	Through-Right	0	Right	27	Right	45	
	Bus Stop on Approach?	Yes	Right-Turn	0	Daily Truck %		7.9%		
Approach #3	Direction		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:		Left-Turn						
	Crosswalk on Approach?		Left-Through		Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?		Through		Left		Left		
	Multi-Use Path?		Left-Through-Right		Through		Through		
	Scheduled Bus Service?		Through-Right		Right		Right		
	Bus Stop on Approach?		Right-Turn		Daily Truck %				

Crash History (Existing Intersections Only)
Append the most recent five-years of crash data for the intersection from the CAR System. If the crash data evidences any issues relating to safety performance, discuss briefly here:
A total of 21 crashes occurred at this intersection from 2017 to 2021. 4 crashes occurred in 2017, 6 occurred in 2018, 9 occurred in 2019, 3 occurred in 2020, and none in 2021. Rear end crashes were the predominant crash type accounting for 41% of the total crashes, followed by angle and left turn crashes accounting for a combined 23% of the total crashes. There were no pedestrian or bicycle crashes at this location. No fatal crash occurred at this location; however, 32% of the crashes were injury crashes. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (10 crashes). Other contributing causes included 'failed to yield right of way' (18%) and 'followed too closely' (18%). Most of the angle and left turn crashes occurring at this location was attributed to failure to yield right of way which may be due to inadequate signal timing and clearance time as well as poor signal visibility.

Control Strategy Evaluation								
Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.								
	CAP-X Outputs				SPICE Outputs		Strategy to be Advanced?	Justification
	V/C Ratio		Ped Accom.	Bike Accom.	Crash Prediction Rank	SSI Rank		
Control Strategy	Weekday AM Peak	Weekday PM Peak						
Two-Way Stop-Controlled	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
All-Way Stop-Controlled	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
Signalized Control	0.79	0.84	4.90	4.62	3	3	Yes	Provides adequate capacity with additional turn lanes. Has the best pedestrian and bike accommodation.
Roundabout (1-lane)	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
Roundabout (2-lane)	3.27	2.42	4.50	4.50	4	2	No	The V/C ratio is greater than one with inadequate capacity to accommodate future traffic demand. Has the highest total predicted crashes.
Median U-Turn	0.82	0.78	3.00	4.58	1	1	Yes	Has the lowest number of predicted crashes and highest SSI score. In addition, V/C ratio is less than one to accommodate future traffic demand.
RCUT (Signalized)	1.16	1.13	3.09	4.32	5	4	No	The V/C ratio is greater than one with inadequate capacity to accommodate future traffic demand. Has the highest fatal/injury predicted crashes.
RCUT (Unsignalized)	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
Jughandle					N/A	N/A	No	A jughandle for the eastbound approach will require an additional crossing over the FEC Railroad, which is not desirable.
Displaced Left-Turn	0.87	0.75	3.10	3.91	2	6	Yes	Both full and partial DLT were considered. However, only the partial DLT is recommended to be evaluated further due to geometric constraints on the west leg.
Continuous Green Tee	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing and future intersection configuration includes 4 approaches and not a T-intersection.
Quadrant Roadway	0.69	0.70	4.66	4.58			Yes	Has the second best V/C ratio with relatively high scores for both pedestrian and bicycle accommodation.
Thru-Cut (Signalized)	1.05	0.95	3.87	4.67	N/A	5	No	The V/C ratio is greater than one with inadequate capacity to accommodate future traffic demand. Low SSI score and rank.
Thru-Cut (Unsignalized)	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
Bowtie	N/A	N/A	N/A	N/A	N/A	N/A	No	The existing intersection is signal controlled.
Grade Separation	0.62	0.51	3.10	3.67	N/A	N/A	Yes	Has the best V/C ratio. Howver, it has one of the least scores for multimodal accomodation. Enhances emergnency response

Resolution					
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer					
Project Determination	Identified Control Strategy Approved				
Comments					
DTOE Name	Jonathan Overton, P.E.	Signature	DocuSigned by: Jonathan Overton D1128312055D45A...	Date	07/11/2023 | 2:10 P
DDE Name	John Olson, P.E.	Signature	DocuSigned by: John Olson D38BA4C842F840E...	Date	08/17/2023 | 5:41 PM

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APPENDIX B

(CAP-X Analysis Results)

Capacity Analysis for Planning of Junctions

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Project Name:	SR 5/US-1 Aviation Boulevard PD&E Study
Project Number:	FM# 441693-1-22-02 ETDM Number 14475
Location:	Indian River County, FL
Date:	2045 AM
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	**Left**	**Thru**	**Right**	Heavy Vehicles	Volume Growth
Eastbound	0	702	81	128	7.90%	0.00%
Westbound	0	281	79	27	7.90%	0.00%
Southbound	0	66	1482	516	4.30%	0.00%
Northbound	0	192	1397	266	4.30%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone	**C2-Rural**		
E-W / Crossing East-West Legs	**Low**	**Low**	**Low**
N-S / Crossing North-South Legs	**Low**	**Low**	**Low**
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

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Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		2	2	1		1	2	2		2	1	1		1	2	0
Quadrant Roadway	N-E			0	0		0	0	0		0	0	0		0	0	0
	S-E		0	0	0		0	0	0			0	0		0	0	0
Partial Displaced Left Turn	N-S		1	2	1		1	2	2		2	1	1		1	2	0
Displaced Left Turn	FULL		1	2	1		1	2	2		1	2	1		1	2	1
Signalized Restricted Crossing U-Turn	N-S	1	1	2	1	1	1	2	1				1				1
Median U-Turn	N-S	2		2	1	2		2	1			2	2			2	1
Signalized ThruCut	N-S		1	2	1		1	2	1		1		1		1		1

Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Single Point	E-W		1	2	1		1	2	1		1	2	1		1	2	1

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Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C			
Traffic Signal	FULL									1339	0.79	0.79	4.90	4.62
Quadrant Roadway	N-E	1432	0.82			789	*0.45*			1251	0.69	0.82	4.67	4.58
	S-E			1215	*0.69*	1209	*0.69*			1230	0.68	0.69	4.66	4.58
Partial Displaced Left Turn	N-S	1194	*0.66*	1135	*0.63*					1228	0.70	0.70	2.95	3.29
Displaced Left Turn	FULL	1180	*0.66*	1135	*0.63*	397	*0.22*	939	*0.52*	1570	0.87	0.87	3.10	3.91
Signalized Restricted Crossing U-Turn	N-S	1562	0.87	2022	1.12	1598	0.89	2080	1.16			1.16	3.09	4.32
Median U-Turn	N-S	1391	0.77	1483	0.82					1395	0.77	0.82	3.00	4.58
Signalized ThruCut	N-S									1838	1.05	1.05	3.87	4.67

Capacity Analysis for Planning of Junctions

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Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3			
2 X 2	1.29	1.32		2.07	0.62		1.56	1.57		3.27	0.81		3.27	4.50	4.50

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C			
Single Point	E-W	775	0.43			1051	0.62					404	0.22	0.62	3.10	3.67

Capacity Analysis for Planning of Junctions

DocuSign Envelope ID: EA734743-CF36-4C6F-8B93-E952B1E0EEC3

Project Name:	SR 5/US-1 Aviation Boulevard PD&E Study
Project Number:	FM# 441693-1-22-02 ETDM Number 14475
Location:	Indian River County, FL
Date:	2045 PM
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	**Left**	**Thru**	**Right**	Heavy Vehicles	Volume Growth
Eastbound	0	523	97	267	7.90%	0.00%
Westbound	0	288	151	45	7.90%	0.00%
Southbound	0	85	1448	566	4.30%	0.00%
Northbound	0	177	1106	294	4.30%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone	**C2-Rural**		
E-W / Crossing East-West Legs	**Low**	**Low**	**Low**
N-S / Crossing North-South Legs	**Low**	**Low**	**Low**
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

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Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		2	2	1		1	2	2		2	1	1		1	2	0
Quadrant Roadway	N-E			0	0		0	0	0		0	0	0		0	0	0
	S-E		0	0	0		0	0	0			0	0		0	0	0
Partial Displaced Left Turn	N-S		1	2	1		1	2	2		2	1	1		1	2	0
Displaced Left Turn	FULL		1	2	1		1	2	2		1	2	1		1	2	1
Signalized Restricted Crossing U-Turn	N-S	1	1	2	1	1	1	2	1				1				1
Median U-Turn	N-S	2		2	1	2		2	1			2	2			2	1
Signalized ThruCut	N-S		1	2	1		1	2	1		1		1		1		1

Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Single Point	E-W		1	2	1		1	2	1		1	2	1		1	2	1

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Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C			
Traffic Signal	FULL									1426	0.84	0.84	4.90	4.62
Quadrant Roadway	N-E	1377	0.79			721	0.41			1094	0.61	0.79	4.65	4.58
	S-E			1226	0.70	991	0.57			1138	0.63	0.70	4.66	4.58
Partial Displaced Left Turn	N-S	977	0.54	1105	0.61					1226	0.70	0.70	2.93	3.29
Displaced Left Turn	FULL	953	0.53	1105	0.61	424	0.24	768	0.43	1349	0.75	0.75	3.09	3.91
Signalized Restricted Crossing U-Turn	N-S	1687	0.94	1659	0.92	1474	0.82	2036	1.13			1.13	3.09	4.32
Median U-Turn	N-S	1405	0.78	1231	0.68					1413	0.78	0.78	3.00	4.58
Signalized ThruCut	N-S									1659	0.95	0.95	3.85	4.67

Capacity Analysis for Planning of Junctions

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Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3			
2 X 2	1.40	1.43		1.33	0.75		1.15	1.17		2.42	1.40		2.42	4.42	4.50

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Ped Accommodations	Bicycle Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C			
Single Point	E-W	868	0.48			870	0.51					458	0.25	0.51	3.08	3.67

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APPENDIX C

(SPICE Analysis Results)

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Florida Department of Transportation
Safety Performance for Intersection Control Evaluation Tool

Results

Summary of crash prediction results for each alternative

Project Information

Project Name:	SR 5/US-1 at Aviation Boulevard PD&E Study	**Intersection Type**	At-Grade Intersection
Intersection:	SR 5/US-1 & Aviation Boulevard	**Opening Year**	2025
Agency:	FDOT District 4	**Design Year**	2045
Project Reference:	FM# 441693-1-22-02 | ETDM Number 14475	**Facility Type**	On Urban and Suburban Arterial
City:	Vero Beach	**Number of Legs**	4-leg
State:	Florida	**1-Way/2-Way**	2-way Intersecting 2-way
Date:	5/10/2022	**# of Major Street Lanes (both directions)**	5 or fewer
Analyst:	GOAL Associates	**Major Street Approach Speed**	Less than 55 mph

Crash Prediction Summary

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	SSI Score: Opening Year	SSI Score: Design Year	SSI Score: Rank
Traffic Signal	Total	6.10	10.12	169.63	3	Yes	Calibrated SPF	77	62	3
	Fatal & Injury	2.52	4.28	70.98						
2-lane Roundabout	Total	17.94	28.51	486.54	4	No	Uncalibrated SPF	79	69	2
	Fatal & Injury	3.38	5.64	94.30						
Displaced Left Turn (DLT)	Total	5.37	8.91	149.27	2	N/A	CMF	43	25	6
	Fatal & Injury	2.21	3.77	62.47						
Median U-Turn (MUT)	Total	5.19	8.60	144.18	1	N/A	CMF	84	76	1
	Fatal & Injury	1.76	3.00	49.69						
Signalized RCUT	Total	15.17	28.04	449.14	5	No	Uncalibrated SPF	74	61	4
	Fatal & Injury	5.22	10.11	158.84						
Signalized Thru-Cut	Total	No SPF	No SPF	No SPF	--	N/A	N/A	72	55	5
	Fatal & Injury	No SPF	No SPF	No SPF						
			--	--						
			--	--						

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APPENDIX D

(Existing Intersection Crash Data)

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CRASH STATISTICS

SR 5/US-1 at Aviation Boulevard Intersection		Number of Crashes by Year					5 Year Total Crashes	Mean Crashes Per Year	%
		2017	2018	2019	2020	2021			
CRASH TYPE	Rear End	1	3	4	1	0	9	3	40.9%
	Head On	0	0	0	0	0	0	0	0.0%
	Angle	1	1	1	0	0	3	1	13.6%
	Left Turn	1	0	0	1	0	2	0	9.1%
	Right Turn	0	1	0	0	0	1	0	4.5%
	Sideswipe	1	1	1	1	0	4	1	18.2%
	Backed Into	0	0	0	0	0	0	0	0.0%
	Pedestrian	0	0	0	0	0	0	0	0.0%
	Bicycle	0	0	0	0	0	0	0	0.0%
	Fixed Object	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*4.5%*
	Impact Attenuator/Crash Cushion	0	0	0	0	0	0	0	0.0%
	Bridge Overhead Structure	0	0	0	0	0	0	0	0.0%
	Bridge Pier or Support	0	0	0	0	0	0	0	0.0%
	Bridge Rail	0	0	0	0	0	0	0	0.0%
	Culvert	0	0	0	0	0	0	0	0.0%
	Curb	0	0	0	0	0	0	0	0.0%
	Ditch	0	0	0	0	0	0	0	0.0%
	Embankment	0	0	0	0	0	0	0	0.0%
	Guardrail Face	0	0	0	0	0	0	0	0.0%
	Guardrail End	0	0	0	0	0	0	0	0.0%
	Cable Barrier	0	0	0	0	0	0	0	0.0%
	Concrete Traffic Barrier	0	0	0	0	0	0	0	0.0%
	Other Traffic Barrier	0	0	0	0	0	0	0	0.0%
	Tree (Standing)	0	0	0	0	0	0	0	0.0%
	Utility Pole/Light Support	0	0	0	0	0	0	0	0.0%
	Traffic Sign Support	0	0	0	0	0	0	0	0.0%
	Traffic Signal Support	0	0	0	0	0	0	0	0.0%
	Other Post, Pole Or Support	0	0	0	0	0	0	0	0.0%
	Fence	0	0	0	0	0	0	0	0.0%
	Mailbox	0	0	0	0	0	0	0	0.0%
	Other Fixed Object	0	0	1	0	0	1	0	4.5%
	Other Non Fixed Object Collisions	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.0%*
	Railway Vehicle (Train, Engine)	0	0	0	0	0	0	0	0.0%
	Animal	0	0	0	0	0	0	0	0.0%
	Motor Vehicle in Transport	0	0	0	0	0	0	0	0.0%
	Parked Motor Vehicle	0	0	0	0	0	0	0	0.0%
	Work Zone/Maintenance Equip.	0	0	0	0	0	0	0	0.0%
	Struck by Falling/Shifting Cargo	0	0	0	0	0	0	0	0.0%
	Other Non-Fixed Object	0	0	0	0	0	0	0	0.0%
	Non-Collisions	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.0%*
	Overturn/Rollover	0	0	0	0	0	0	0	0.0%
	Fire/Explosion	0	0	0	0	0	0	0	0.0%
	Immersion	0	0	0	0	0	0	0	0.0%
	Jackknife	0	0	0	0	0	0	0	0.0%
	Cargo/Equipment Loss or Shift	0	0	0	0	0	0	0	0.0%
	Fell/Jumped from Motor Vehicle	0	0	0	0	0	0	0	0.0%
	Thrown or Falling Object	0	0	0	0	0	0	0	0.0%
	Ran into Water/Canal	0	0	0	0	0	0	0	0.0%
	Other Non-Collision	0	0	0	0	0	0	0	0.0%
	Others	0	0	2	0	0	2	0	9.1%
	Total Crashes	**4**	**6**	**9**	**3**	**0**	**22**	**4**	**100.0%**
SEVERITY	PDO Crashes	4	3	7	1	0	15	3	68.2%
	Fatal Crashes	0	0	0	0	0	0	0	0.0%
	Injury Crashes	0	3	2	2	0	7	1	31.8%

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CRASH STATISTICS

SR 5/US-1 at Aviation Boulevard Intersection		Number of Crashes Year					5 Year Total Crashes	Mean Crashes Per Year	%
		2017	2018	2019	2020	2021			
LIGHTING CONDITIONS	Daylight	4	5	5	2	0	16	3	72.7%
	Dusk	0	0	1	0	0	1	0	4.5%
	Dawn	0	0	0	0	0	0	0	0.0%
	Dark	0	1	3	1	0	5	1	22.7%
	Unknown	0	0	0	0	0	0	0	0.0%
SURFACE CONDITIONS	Dry	4	5	8	3	0	20	4	90.9%
	Wet	0	1	1	0	0	2	0	9.1%
	Others	0	0	0	0	0	0	0	0.0%
MONTH OF YEAR	January	0	0	2	0	0	2	0	9.1%
	February	0	0	2	1	0	3	1	13.6%
	March	1	1	0	0	0	2	0	9.1%
	April	1	2	2	0	0	5	1	22.7%
	May	0	0	0	0	0	0	0	0.0%
	June	0	1	1	0	0	2	0	9.1%
	July	1	0	0	0	0	1	0	4.5%
	August	0	1	0	0	0	1	0	4.5%
	September	1	0	0	0	0	1	0	4.5%
	October	0	0	0	0	0	0	0	0.0%
	November	0	1	0	0	0	1	0	4.5%
	December	0	0	2	2	0	4	1	18.2%
DAY OF WEEK	Monday	1	1	2	0	0	4	1	18.2%
	Tuesday	0	1	1	2	0	4	1	18.2%
	Wednesday	3	1	1	0	0	5	1	22.7%
	Thursday	0	1	2	1	0	4	1	18.2%
	Friday	0	0	0	0	0	0	0	0.0%
	Saturday	0	1	2	0	0	3	1	13.6%
	Sunday	0	1	1	0	0	2	0	9.1%
HOUR OF DAY	00:00-06:00	0	0	0	0	0	0	0	0.0%
	06:00-09:00	0	0	0	0	0	0	0	0.0%
	09:00-11:00	1	2	0	0	0	3	1	13.6%
	11:00-13:00	2	1	1	2	0	6	1	27.3%
	13:00-15:00	0	1	2	0	0	3	1	13.6%
	15:00-18:00	1	1	3	0	0	5	1	22.7%
	18:00-24:00	0	1	3	1	0	5	1	22.7%
CONTRIBUTING CAUSES (VEHICLE ONLY)	No Contributing Action	0	1	1	0	0	2	0	9.1%
	Careless or Negligent Manner	1	3	0	2	0	6	1	27.3%
	Failed to Yield Right-Of-Way	3	1	0	0	0	4	1	18.2%
	Improper Backing	0	0	0	0	0	0	0	0.0%
	Improper Turn	0	0	0	0	0	0	0	0.0%
	Followed too Closely	0	0	4	0	0	4	1	18.2%
	Ran Red Light	0	0	0	0	0	0	0	0.0%
	Drove too Fast for Conditions	0	0	0	0	0	0	0	0.0%
	Ran Stop Sign	0	0	0	0	0	0	0	0.0%
	Improper Passing	0	0	0	1	0	1	0	4.5%
	Exceed Posted Speed	0	0	0	0	0	0	0	0.0%
	Wrong Side or Wrong Way	0	0	0	0	0	0	0	0.0%
	Failed To Keep In Proper Lane	0	1	0	0	0	1	0	4.5%
	Ran Off Roadway	0	0	1	0	0	1	0	4.5%
	Disregarded Other Traffic Sign	0	0	0	0	0	0	0	0.0%
	Disregarded other Road Markings	0	0	0	0	0	0	0	0.0%
	Over-Correcting/Over-Steering	0	0	0	0	0	0	0	0.0%
	Swerved Or Avoided	0	0	0	0	0	0	0	0.0%
	Erratic, Reckless or Aggressive	0	0	0	0	0	0	0	0.0%
	Other Contributing Action	0	0	3	0	0	3	1	13.6%

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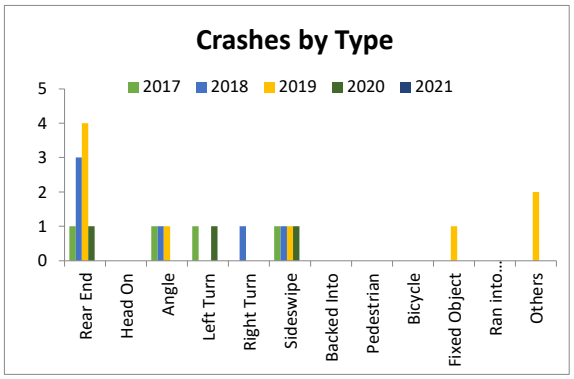
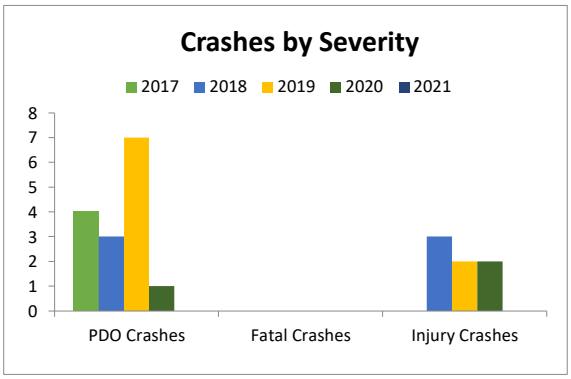
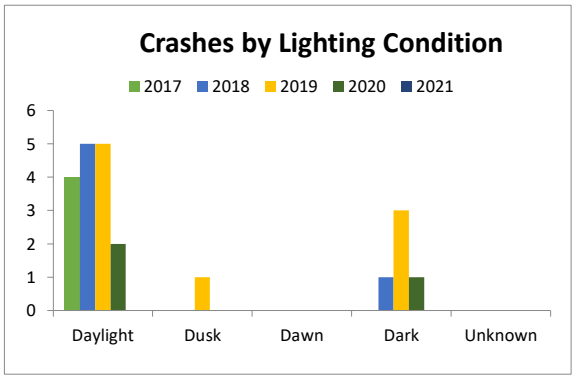
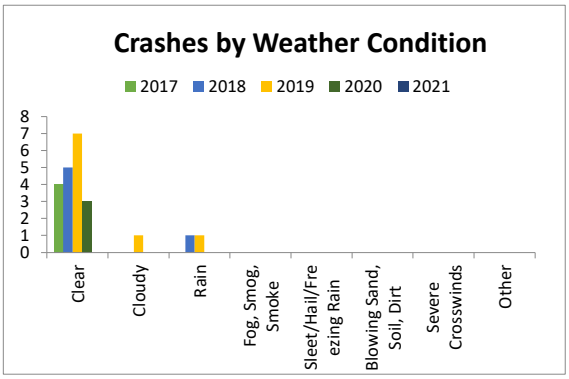
CRASH STATISTICS

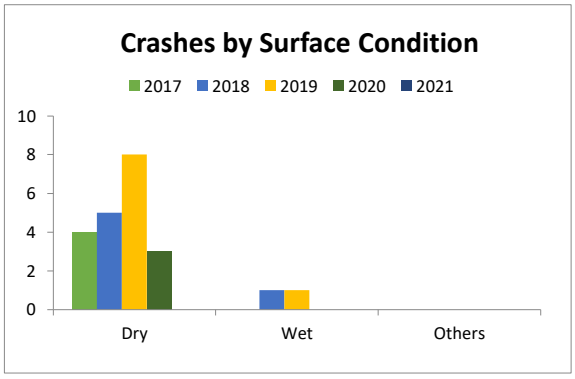
SR 5/US-1 at Aviation Boulevard Intersection

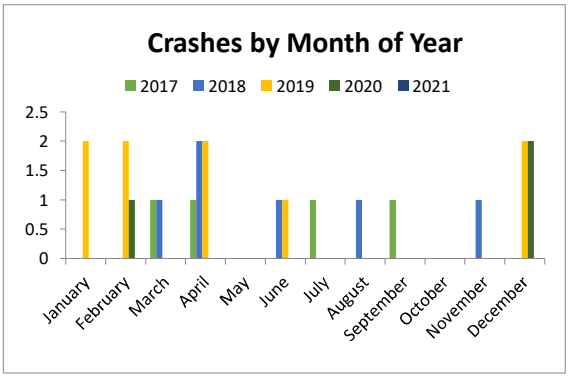


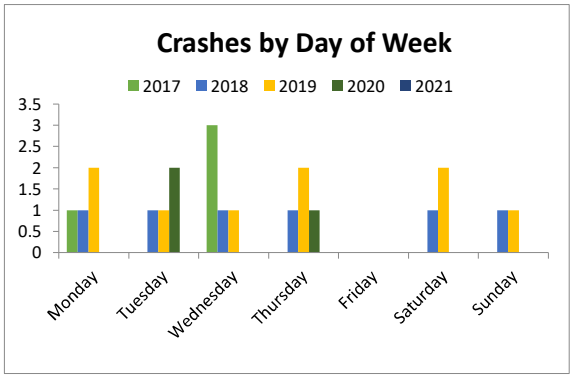


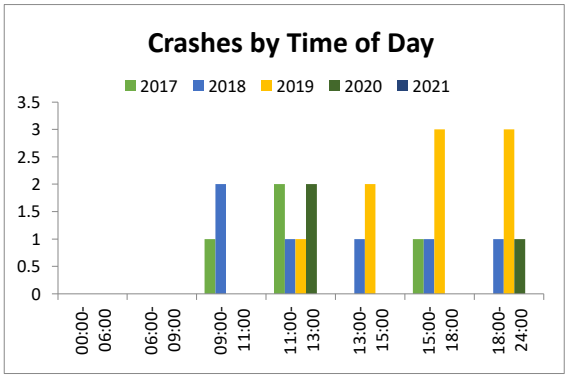






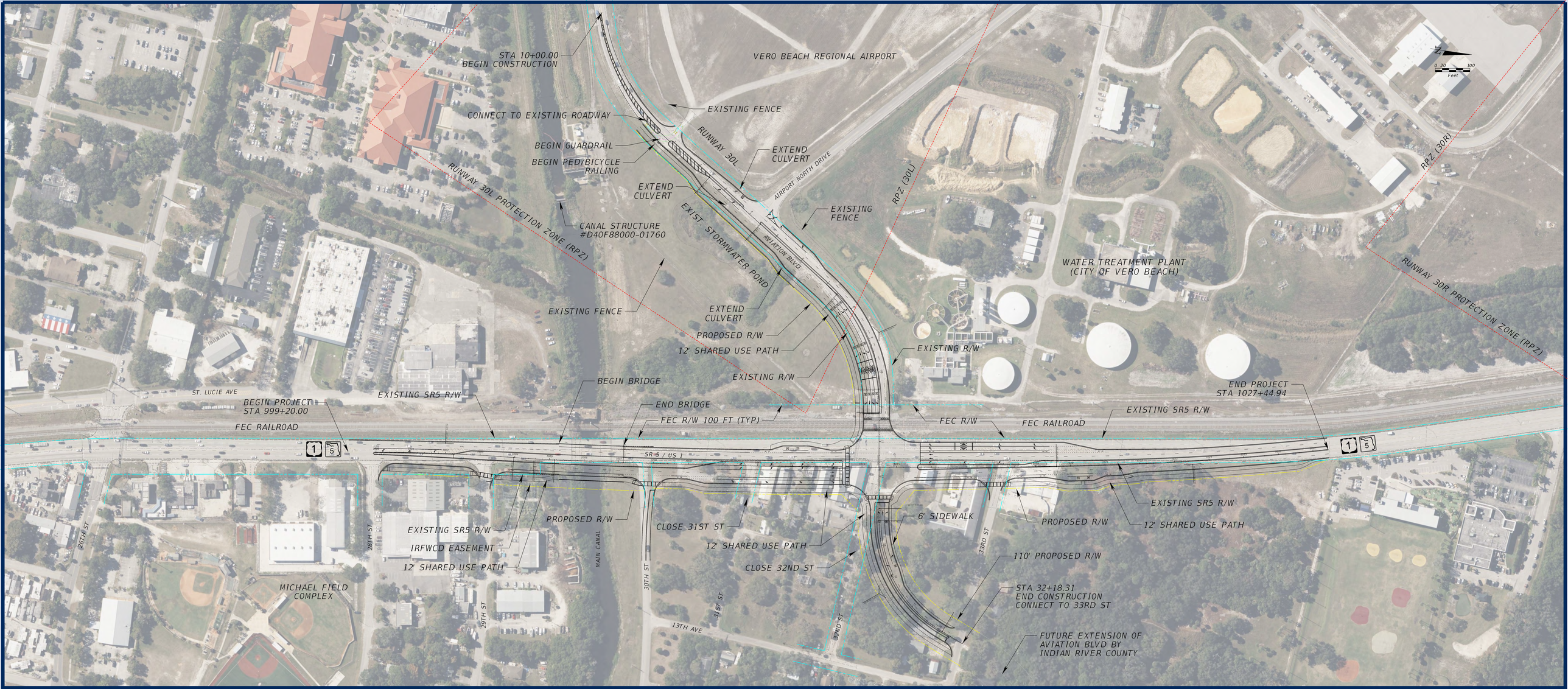






APPENDIX G

(Preliminary Build Alternatives Concepts)



Preferred Alternative

(Alternative 1)

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

1

Draft Alternative

February 1st, 2024

Alternative 2 - One-Way Pair

FDOT

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

1

Alternatives Public Workshop

October 10th & 11th, 2023

ALTERNATIVE 3
US 1 OVERPASS

DRAFT – SUBJECT TO REVISION 5/17/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760
RUNWAY 30L PROTECTION ZONE (RPZ)
RUNWAY 30L
AVIATION BLVD
AIRPORT NORTH DRIVE
CONNECT TO EXISTING ROADWAY
EXIST. STORMWATER POND
EXISTING FENCE
RPZ (30L)
WATER TREATMENT PLANT (CITY OF VERO BEACH)
RPZ (30R)
PROPOSED R/W
EXISTING R/W
EXISTING FENCE
DESIGN SPEED = 30 MPH
R = 335'
e = .032
EXISTING R/W
FEC RAILROAD
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
SR 5 / US 1
BEGIN PROJECT
END PROJECT
EXISTING SR5 R/W
SHARED USE PATH
SHARED USE PATH
PROPOSED R/W
PROPOSED R/W
MAIN CANAL
28TH ST
29TH ST
30TH ST
31ST ST
32ND ST
33RD ST
MICHAEL FIELD COMPLEX
13TH AVE
DESIGN SPEED = 30 MPH
R = 375'
e = .024
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT
DESIGN SPEED = 30 MPH
R = 520'
e = NC
AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY
CONNECT TO 13TH AVE
110' PROPOSED R/W

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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ALTERNATIVE 4
AVIATION BOULEVARD FOUR-LANE OVERPASS
DRAFT – SUBJECT TO REVISION 5/17/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

RUNWAY 30L
AVIATION BLVD
AIRPORT NORTH DRIVE
CANAL STRUCTURE #D40F88000-01760
EXIST. STORMWATER POND
OVERPASS TIE-IN TO EXISTING GRADE
EXISTING FENCE
RUNWAY 30L PROTECTION ZONE (RPZ)
WATER TREATMENT PLANT (CITY OF VERO BEACH)
RPZ (30R)
EXISTING FENCE
DESIGN SPEED = 30 MPH
R = 341'
e = .031
PROPOSED R/W
EXISTING R/W
END PROJECT
BEGIN PROJECT
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
SR 5 / US 1
PROPOSED R/W
PROPOSED R/W
MAIN CANAL
30TH ST
TEXAS U-TURN UNDER THE BRIDGE ACCESS TO 32ND ST EASTBOUND ONLY
33RD ST
28TH ST
29TH ST
31ST ST
32ND ST
DESIGN SPEED = 30 MPH
R = 820'
e = NC
PROPOSED R/W
MICHAEL FIELD COMPLEX
13TH AVE
DESIGN SPEED = 35 MPH
R = 775'
e = RC
OVERPASS TIE-IN TO EXISTING GRADE
PROPOSED R/W
QUADRANT ROAD
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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ALTERNATIVE 5
AVIATION BOULEVARD UNDERPASS
DRAFT – SUBJECT TO REVISION 5/17/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L

AVIATION BLVD

AIRPORT NORTH DRIVE

EXIST. STORMWATER POND

UNDERPASS TIE-IN TO EXISTING GRADE

RUNWAY 30L PROTECTION ZONE (RPZ)

EXISTING FENCE

WATER TREATMENT PLANT (CITY OF VERO BEACH)

EXISTING FENCE

DESIGN SPEED = 30 MPH
R = 341'
e = .031

EXISTING R/W

EXISTING R/W

RPZ (30R)

END PROJECT

BEGIN PROJECT

FEC R/W

FEC R/W

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

SR 5 / US 1

PROPOSED R/W

BRIDGE FOR FEC

BRIDGE FOR US-1

MAIN CANAL

30TH ST

31ST ST

32ND ST

33RD ST

13TH AVE

DESIGN SPEED = 30 MPH
R = 825'
e = NC

DESIGN SPEED = 35 MPH
R = 775'
e = RC

UNDERPASS TIE-IN TO EXISTING GRADE

QUADRANT ROAD

POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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ALTERNATIVE 6
AVIATION BOULEVARD OVERPASS
DRAFT - SUBJECT TO REVISION 5/17/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L PROTECTION ZONE (RPZ)

RUNWAY 30L

AVIATION BLVD

AIRPORT NORTH DRIVE

RPZ (30L)

EXIST. STORMWATER POND

EXISTING FENCE

APPROXIMATE POINT OF TIE-IN

WATER TREATMENT PLANT (CITY OF VERO BEACH)

RPZ (30R)

EXISTING FENCE

DESIGN SPEED = 30 MPH
R = 409'
e = RC

EXISTING R/W

TEXAS U-TURN UNDER THE BRIDGE

EXISTING R/W

BEGIN PROJECT

FEC R/W

FEC R/W

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

END PROJECT

SR 5 / US 1

MAIN CANAL

29TH ST

30TH ST

31ST ST

32ND ST

33RD ST

13TH AVE

TEXAS U-TURN UNDER THE BRIDGE
ACCESS TO 32ND ST EASTBOUND ONLY

DESIGN SPEED = 30 MPH
R = 409'
e = RC

APPROXIMATE POINT OF TIE-IN

ALTERNATIVE 6 REQUIRES EXTENSION OF AVIATION BLVD. TO BE CONSTRUCTED

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

Microsoft Bing
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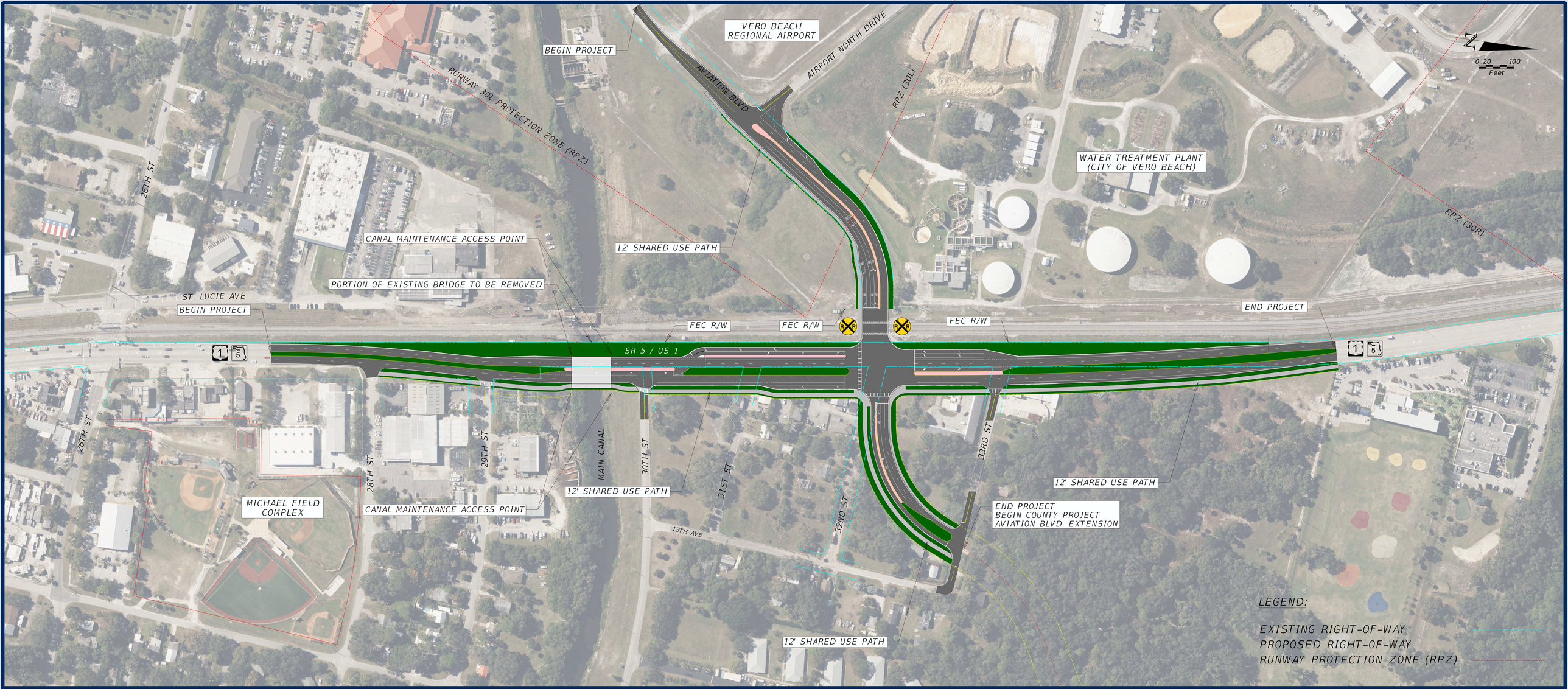


Alternative 7 - Displaced Left Turn Intersection

FDOT

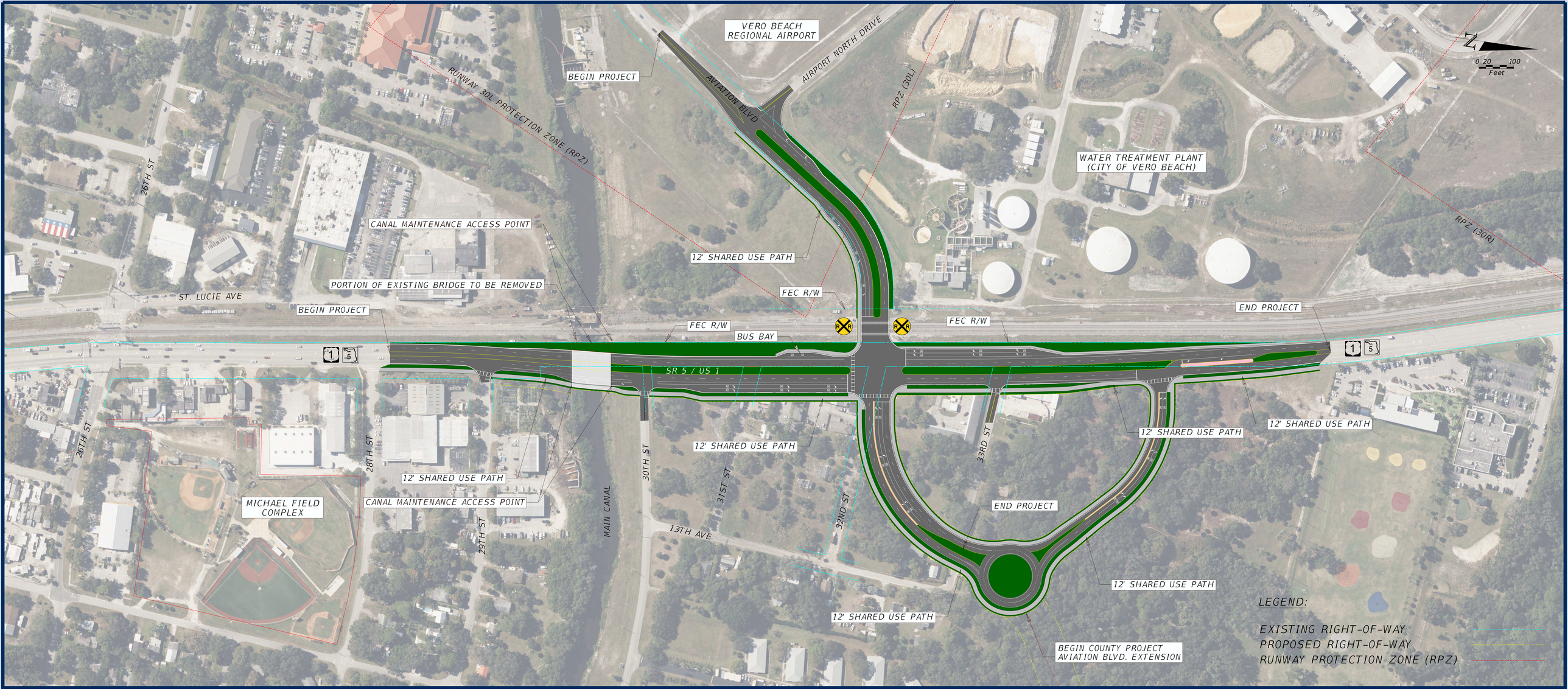
State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

1

Alternatives Public Workshop

October 10th & 11th, 2023



Alternative 8 - Median U-Turn with Roundabout

FDOT

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

1

Alternatives Public Workshop

October 10th & 11th, 2023

APPENDIX H

(Alternatives Screening Evaluation Matrix)

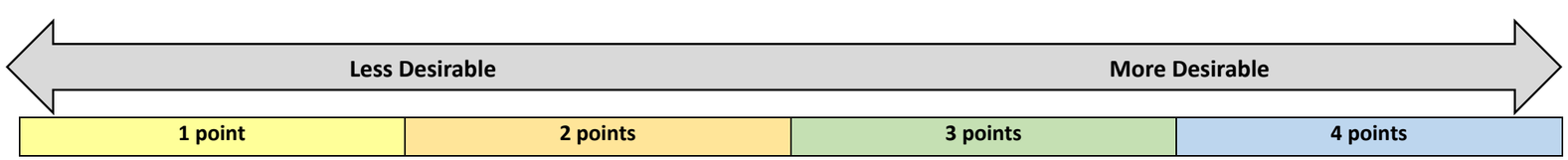
SCREENING EVALUATION MATRIX

SR 5/US-1 at Aviation Boulevard PD&E Study FM: 4441693-1-22-02

Note: Environmental impacts are planning level estimates.

CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 TWIN INTERSECTIONS	ALTERNATIVE 3 US-1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (without railroad crossing)	ALTERNATIVE 5 AVATION BLVD UNDERPASS (without railroad crossing)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (with railroad crossing)	ALTERNATIVE 7 DEFLECTED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
PD&E PURPOSE AND NEED **IMPROVES SAFETY**	Yes (3)	Yes: Reduced speeds and conflict points. Short crosswalks. Adds 1 intersection. NB US-1 curvature potential sight distance challenges. (2)	Yes: Reduced conflict points. (3)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Keeps at-grade railroad crossing and adds an overpass over railroad. (3)	Yes. Reduced conflict points. Adds 1 DLT intersection. (3)	Yes: Reduced speeds and conflict points with roundabout. Adds 1 directional intersection. (3)
PD&E PURPOSE AND NEED **ADDRESSES TRAFFIC DEMAND**	LOS D (3)	US-1 SB LOS C US-1 NB LOS D (3)	LOS C (4)	US-1 LOS B New Quadrant Rd US-1 @ QR LOS C Aviation @ QR LOS C (4)	New Quadrant Rd US-1 @ QR LOS C Aviation @ QR LOS D (3)	US-1 @ QR LOS C required. (4)	US-1 LOS D US-1 DLT LOS A (3)	US-1 LOS C, New Quadrant Road (QR) US-1 @ QR LOS B Aviation @ QR LOS C (4)
PD&E PURPOSE AND NEED **ENHANCES MULTIMODAL**	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Crosswalk at DLT Signal. (3)	Shared Use Path (4)
LOCAL GOVERNMENT AND PUBLIC SUPPORT	City supported. Public supported. County supported. (4)	City opposed. County neutral. (1)	City opposed. Public opposed. County wants Aviation Blvd. overpass (1)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City supported. County supported. (4)	City supported. County supported. (4)
COMPATIBLE WITH FAA AND ARIPORT NEEDS	Yes (4)	Yes (4)	Elevated roadway outside RPZ. (1)	Elevated roadway inside RPZ. Reduces traffic queue in RPZ. (1)	Depressed roadway inside RPZ. (1)	Elevated roadway inside RPZ. (1)	Yes (4)	Yes (4)
COMPATIBLE WITH FEC RAILROAD NEEDS	Yes: 6 lanes at rail crossing (2)	Yes: 6 lanes at rail crossing. (2)	Yes: 6 lanes at rail crossing. (2)	Yes: Removes at-grade rail crossing. (4)	Yes: Removes at-grade rail crossing. (4)	Yes: 3 lanes at rail crossing. (3)	Yes: 6 lanes at rail crossing. Adds separated NB deflected left turn lane at RR crossing. (2)	Yes: 5 lanes at rail crossing. (3)
COMPATIBLE WITH AVIATION BLVD EXTENSION	Yes (3)	Yes (3)	Yes (3)	Yes: Extension would connect at quadrant road intersection. (3)	Yes: Extension would connect at quadrant road intersection. (3)	PD&E Alt 6 does not have independent utility. Needs Aviation Blvd extension built to have logical termini. (1)	Yes. (3)	Yes: Extension would connect at quadrant road roundabout. (3)
ACCESS MANAGEMENT COMPATIBILITY WITH LOCAL STREET NETWORK	Maintains existing access. (4)	Changes circulation on 30th, 31st,32nd, 33rd Streets and 13th Ave. (2)	Close access to 30th and 33rd Streets. Reduces property access along US-1 ramps. (1)	Closes 31st Street. Disconnects 13th Ave and 33rd St from local network. Increased access with quadrant road. (1)	Closes 32nd Streets. Maintains access to 30th and 31st Streets. Eliminates access to Aviation Blvd east of US-1. Increased access with quadrant road. (1)	Maintains access to 30th, 31st and 33rd Streets. Eliminates access to Aviation Blvd east of US-1. (2)	Closes access to 31st and 32nd Streets. Adds new directional signalized median. (3)	Close access to 31st and 32nd Streets. Roundabout provides local traffic circulation. Increased access with quadrant road. (4)

LEGEND:



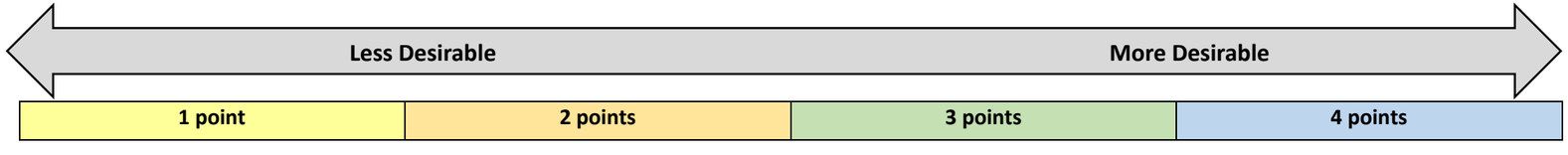
SCREENING EVALUATION MATRIX

SR 5/US-1 at Aviation Boulevard PD&E Study FM: 4441693-1-22-02

Note: Environmental impacts are planning level estimates.

CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 TWIN INTERSECTIONS	ALTERNATIVE 3 US-1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (without railroad crossing)	ALTERNATIVE 5 AVATION BLVD UNDERPASS (without railroad crossing)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (with railroad crossing)	ALTERNATIVE 7 DEFLECTED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
PROPERTY IMPACT TYPES	Business and residential impacts. (2)	Reduced business impacts on US-1. Impacts homes on 13th Ave. US-1 NB lanes split parcels into 2 parts. (1)	Business and residential impacts. (2)	Business and residential impacts. Physical separation of land north/south of overpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of underpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of overpass. (1)	Business and residential impacts. (2)	Business and residential impacts. (2)
PARCELS EFFECTED AND POTENTIAL DISPLACEMENTS	21 Parcels. Potential 9 business and 2 residential displacements. (2)	35 Parcels. Potential 2 business displacements. Potential 10 residential displacements along 13 Ave. (1)	23 Parcels. Potential 9 business and 2 residential displacements. (2)	35 parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7acres) (1)	35 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7 acres) (1)	27 Parcels. Potential 9 business and 6 residential and 2 residential displacements. Quadrant Road (3.7acres) (1)	22 Parcels. Potential 9 business and 2 residential displacements. (2)	25 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (2 acres) (1)
CULTURAL: HISTORIC AND ARCHEOLOGICAL POTENTIAL	Minor (2)	Minor (2)	Minor (2)	Minor (2)	Substantial excavation required adjacent to Vero Man site, increased potential for archeological findings. (1)	Minor (2)	Minor (2)	Minor (2)
NATURAL ENVIRONMENT	Minor (3)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)
PHYSICAL: NOISE	Low (3)	Shifts US-1 NB lanes eastward 500 feet towards homes. (1)	Elevated US-1 structure. (2)	Elevated Aviation Blvd structure. (1)	Depressed Aviation Blvd structure. (1)	Elevated Aviation Blvd structure. (1)	Low (3)	Road closer to residential. (2)
PHYSICAL: CONTAMINATION	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)
CONSTRUCTABILITY	Typical construction. One Main Canal Bridge. (4)	Requires 2 bridges over Main Canal. (3)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires Aviation Blvd underpass, high speed railroad track detour, railroad bridge, US 1 bridge at underpass, Main Canal Bridge. (1)	Requires Aviation Blvd Overpass. 1 Main Canal bridge. (2)	Requires two US-1 medians and 1 Main Canal bridge. (3)	Typical Construction. 1 Main Canal bridge. (4)
COST: CONSTRUCTION	Low (4)	Moderate (3)	High (2)	High (2)	Very High (1)	High (2)	Low (4)	Moderate (3)
TOTAL POINTS: (HIGHER IS DESIRABLE)	49	37	36	35	31	31	46	47
RANKING	1	4	5	6	8	7	3	2
SELECTED TO MOVE TO DETAILED PD&E PHASE	**YES**	**Yes**	Eliminate: Opposed by City. Aviation Blvd not raised.	Eliminate: Opposed by City.	Eliminate: Not viable due to constructability.	Eliminate: Not viable due to logical termini.	**YES**	**YES**

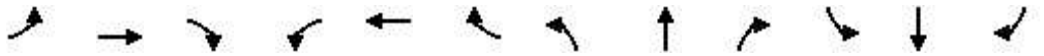
LEGEND:



APPENDIX I

(No-Build Alternative Intersection LOS Results)

2025 No Build Intersection LOS Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	65	78	196	55	11	140	956	195	26	1031	350
Future Volume (veh/h)	475	65	78	196	55	11	140	956	195	26	1031	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	325	313	82	206	58	12	147	1006	205	27	1085	368
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	362	291	76	223	63	13	139	1308	266	238	1056	353
Arrive On Green	0.21	0.21	0.21	0.17	0.17	0.17	0.10	0.89	0.89	0.02	0.40	0.40
Sat Flow, veh/h	1753	1406	368	1315	370	77	1781	2941	598	1781	2615	875
Grp Volume(v), veh/h	325	0	395	276	0	0	147	607	604	27	732	721
Grp Sat Flow(s),veh/h/ln	1753	0	1774	1761	0	0	1781	1777	1763	1781	1777	1713
Q Serve(g_s), s	27.1	0.0	31.0	23.2	0.0	0.0	7.7	17.9	18.1	1.3	60.6	60.6
Cycle Q Clear(g_c), s	27.1	0.0	31.0	23.2	0.0	0.0	7.7	17.9	18.1	1.3	60.6	60.6
Prop In Lane	1.00		0.21	0.75		0.04	1.00		0.34	1.00		0.51
Lane Grp Cap(c), veh/h	362	0	367	298	0	0	139	790	784	238	718	692
V/C Ratio(X)	0.90	0.00	1.08	0.93	0.00	0.00	1.05	0.77	0.77	0.11	1.02	1.04
Avail Cap(c_a), veh/h	362	0	367	315	0	0	139	790	784	257	718	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.91	0.91	0.91	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.9	0.0	59.5	61.4	0.0	0.0	38.5	5.6	5.6	25.6	44.7	44.7
Incr Delay (d2), s/veh	23.9	0.0	69.1	31.2	0.0	0.0	87.8	6.5	6.6	0.2	36.9	43.6
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(95%),veh/ln	20.7	0.0	29.7	18.9	0.0	0.0	10.6	7.2	7.2	1.1	43.5	44.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.9	0.0	128.6	92.6	0.0	0.0	126.3	12.0	12.2	25.7	81.6	88.3
LnGrp LOS	F	A	F	F	A	A	F	B	B	C	F	F
Approach Vol, veh/h		720			276			1358			1480	
Approach Delay, s/veh		107.5			92.6			24.5			83.9	
Approach LOS		F			F			C			F	

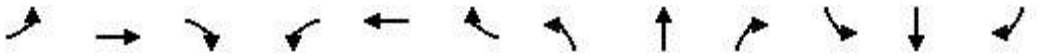
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	67.4		31.6	7.9	73.5		37.0				
Change Period (Y+Rc), s	* 6.3	6.8		* 6.2	4.5	6.8		6.0				
Max Green Setting (Gmax), s	* 7.7	59.2		* 27	5.0	63.7		31.0				
Max Q Clear Time (g_c+I1), s	9.7	62.6		25.2	3.3	20.1		33.0				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	11.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	67.9
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Future Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	122	56	12	28	21	84	1069	15	16	1192	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	148	155	132	20	47	57	382	2703	38	386	2360	97
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	0.03	0.75	0.75	0.90	0.90	0.90
Sat Flow, veh/h	1753	1841	1560	544	1269	1560	1781	3588	50	520	3479	143
Grp Volume(v), veh/h	98	122	56	40	0	21	84	529	555	16	609	632
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1814	0	1560	1781	1777	1861	520	1777	1845
Q Serve(g_s), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	0.7	9.2	9.2
Cycle Q Clear(g_c), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	5.1	9.2	9.2
Prop In Lane	1.00		1.00	0.30		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	148	155	132	67	0	57	382	1339	1402	386	1206	1252
V/C Ratio(X)	0.66	0.79	0.43	0.60	0.00	0.37	0.22	0.40	0.40	0.04	0.50	0.51
Avail Cap(c_a), veh/h	292	307	260	375	0	322	415	1339	1402	386	1206	1252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	66.6	67.3	65.2	71.1	0.0	70.5	6.5	6.5	6.5	2.9	2.8	2.8
Incr Delay (d2), s/veh	5.0	8.5	2.2	8.3	0.0	3.8	0.3	0.9	0.8	0.0	0.1	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(95%),veh/ln	7.0	8.6	3.8	3.0	0.0	1.5	1.4	9.9	10.2	0.1	2.9	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	75.8	67.4	79.4	0.0	74.4	6.8	7.4	7.3	2.9	2.9	2.9
LnGrp LOS	E	E	E	E	A	E	A	A	A	A	A	A
Approach Vol, veh/h		276			61			1168			1257	
Approach Delay, s/veh		72.6			77.7			7.3			2.9	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	108.6		11.5		119.8		18.6				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	4.0	11.2		5.3		17.7		11.7				
Green Ext Time (p_c), s	0.0	12.1		0.2		9.5		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		13.4	
HCM 6th LOS		B	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	78	1153	211	217	1289
Future Volume (veh/h)	74	78	1153	211	217	1289
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	82	1214	222	228	1357
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	220	169	2289	416	349	3007
Arrive On Green	0.06	0.06	0.76	0.76	0.04	0.85
Sat Flow, veh/h	3401	1560	3097	545	1781	3647
Grp Volume(v), veh/h	78	82	715	721	228	1357
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1772	1781	1777
Q Serve(g_s), s	3.3	7.4	24.0	24.5	4.0	14.3
Cycle Q Clear(g_c), s	3.3	7.4	24.0	24.5	4.0	14.3
Prop In Lane	1.00	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	220	169	1354	1351	349	3007
V/C Ratio(X)	0.36	0.48	0.53	0.53	0.65	0.45
Avail Cap(c_a), veh/h	395	249	1354	1351	580	3007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.49	0.49	1.00	1.00
Uniform Delay (d), s/veh	67.2	62.9	7.1	7.2	8.8	2.9
Incr Delay (d2), s/veh	1.0	2.1	0.7	0.7	2.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	10.8	12.1	12.2	5.1	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	65.1	7.8	7.9	10.9	3.4
LnGrp LOS	E	E	A	A	B	A
Approach Vol, veh/h	160		1436			1585
Approach Delay, s/veh	66.6		7.9			4.5
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.7		16.3	12.6	121.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		16.3		9.4	6.0	26.5
Green Ext Time (p_c), s		16.5		0.3	0.6	16.2

Intersection Summary	
HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Future Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	356	0	146	339	1	204	0	0	0	0	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	876		562	1130	3	248	0		0	0	13
Arrive On Green	0.00	0.48	0.00	0.06	0.62	0.62	0.14	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	0	1841	0	1753	1834	5	1753	204		0	0	1560
Grp Volume(v), veh/h	0	356	0	146	0	340	204	39.0		0	0	3
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1840	1753	D		0	0	1560
Q Serve(g_s), s	0.0	9.4	0.0	2.9	0.0	6.5	8.4			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	9.4	0.0	2.9	0.0	6.5	8.4			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	876		562	0	1133	248			0	0	13
V/C Ratio(X)	0.00	0.41		0.26	0.00	0.30	0.82			0.00	0.00	0.24
Avail Cap(c_a), veh/h	0	876		598	0	1133	387			0	0	209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.7	0.0	8.7	0.0	6.8	31.1			0.0	0.0	36.8
Incr Delay (d2), s/veh	0.0	1.4	0.0	0.2	0.0	0.7	7.9			0.0	0.0	9.4
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
%ile BackOfQ(95%),veh/ln	0.0	7.0	0.0	1.8	0.0	4.2	7.2			0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.1	0.0	8.9	0.0	7.4	39.0			0.0	0.0	46.2
LnGrp LOS	A	B		A	A	A	D			A	A	D
Approach Vol, veh/h		356	A		486						3	
Approach Delay, s/veh		14.1			7.9						46.2	
Approach LOS		B			A						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		52.0	16.4	6.3	10.5	41.5						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		46.0	* 17	* 10	* 6.3	34.0						
Max Q Clear Time (g_c+I1), s		8.5	10.4	2.1	4.9	11.4						
Green Ext Time (p_c), s		2.3	0.3	0.0	0.0	2.2						

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Notes

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

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	44	90	458	11	16
Future Volume (veh/h)	526	44	90	458	11	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	554	46	95	482	12	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	769	652	416	1133	220	195
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	554	46	95	482	12	17
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.0	0.8	1.3	6.5	0.3	0.5
Cycle Q Clear(g_c), s	12.0	0.8	1.3	6.5	0.3	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	652	416	1133	220	195
V/C Ratio(X)	0.72	0.07	0.23	0.43	0.05	0.09
Avail Cap(c_a), veh/h	2253	1909	545	2752	220	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	8.4	7.8	4.8	18.4	18.5
Incr Delay (d2), s/veh	1.3	0.0	0.3	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	0.4	0.6	2.7	0.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	8.4	8.1	5.0	18.5	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	600			577	29	
Approach Delay, s/veh	12.6			5.5	18.6	
Approach LOS	B			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.9		12.0	9.5	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		8.5		2.5	3.3	14.0
Green Ext Time (p_c), s		3.5		0.0	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

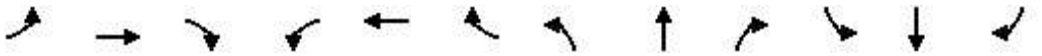
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	70	204	200	106	20	127	745	219	35	1054	367
Future Volume (veh/h)	395	70	204	200	106	20	127	745	219	35	1054	367
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	352	163	215	211	112	21	134	784	231	37	1109	386
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	362	149	196	215	114	21	131	984	290	165	897	307
Arrive On Green	0.21	0.21	0.21	0.20	0.20	0.20	0.04	0.36	0.36	0.03	0.35	0.35
Sat Flow, veh/h	1753	720	950	1084	575	108	1781	2706	797	1781	2598	889
Grp Volume(v), veh/h	352	0	378	344	0	0	134	515	500	37	752	743
Grp Sat Flow(s),veh/h/ln	1753	0	1670	1767	0	0	1781	1777	1727	1781	1777	1710
Q Serve(g_s), s	25.5	0.0	26.4	24.8	0.0	0.0	5.4	33.2	33.2	1.7	44.2	44.2
Cycle Q Clear(g_c), s	25.5	0.0	26.4	24.8	0.0	0.0	5.4	33.2	33.2	1.7	44.2	44.2
Prop In Lane	1.00		0.57	0.61		0.06	1.00		0.46	1.00		0.52
Lane Grp Cap(c), veh/h	362	0	344	351	0	0	131	646	628	165	614	591
V/C Ratio(X)	0.97	0.00	1.10	0.98	0.00	0.00	1.02	0.80	0.80	0.22	1.23	1.26
Avail Cap(c_a), veh/h	362	0	344	351	0	0	131	646	628	184	614	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.92	0.92	0.92	0.87	0.87	0.87
Uniform Delay (d), s/veh	50.5	0.0	50.8	51.1	0.0	0.0	37.2	36.5	36.5	29.6	41.9	41.9
Incr Delay (d2), s/veh	40.2	0.0	77.3	42.8	0.0	0.0	80.6	9.1	9.4	0.6	114.2	127.5
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(95%),veh/ln	21.6	0.0	26.7	21.5	0.0	0.0	8.0	22.2	21.7	1.4	54.7	56.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.6	0.0	128.1	93.9	0.0	0.0	117.8	45.6	45.9	30.2	156.1	169.4
LnGrp LOS	F	A	F	F	A	A	F	D	D	C	F	F
Approach Vol, veh/h		730			344			1149			1532	
Approach Delay, s/veh		110.0			93.9			54.1			159.5	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	51.0		32.0	9.7	53.3		33.0				
Change Period (Y+Rc), s	6.6	6.8		6.6	6.0	6.8		6.6				
Max Green Setting (Gmax), s	5.4	44.2		25.4	5.0	45.2		26.4				
Max Q Clear Time (g_c+I1), s	7.4	46.2		26.8	3.7	35.2		28.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	4.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		111.6	
HCM 6th LOS		F	

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Future Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	95	131	29	25	8	83	993	26	12	1462	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	177	186	158	40	34	64	243	2592	68	396	2274	105
Arrive On Green	0.20	0.20	0.20	0.08	0.08	0.08	0.03	0.73	0.73	0.66	0.66	0.66
Sat Flow, veh/h	1753	1841	1560	963	830	1560	1781	3538	93	553	3458	160
Grp Volume(v), veh/h	79	95	131	54	0	8	83	499	520	12	749	781
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1793	0	1560	1781	1777	1854	553	1777	1841
Q Serve(g_s), s	5.9	6.9	12.1	4.4	0.0	0.7	2.2	15.6	15.6	1.2	37.5	37.8
Cycle Q Clear(g_c), s	5.9	6.9	12.1	4.4	0.0	0.7	2.2	15.6	15.6	5.6	37.5	37.8
Prop In Lane	1.00		1.00	0.54		1.00	1.00		0.05	1.00		0.09
Lane Grp Cap(c), veh/h	177	186	158	74	0	64	243	1302	1358	396	1169	1211
V/C Ratio(X)	0.45	0.51	0.83	0.73	0.00	0.12	0.34	0.38	0.38	0.03	0.64	0.64
Avail Cap(c_a), veh/h	374	393	333	382	0	333	276	1302	1358	396	1169	1211
HCM Platoon Ratio	2.00	2.00	2.00	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	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	56.2	56.6	58.6	68.0	0.0	66.3	13.9	7.5	7.5	10.6	15.2	15.3
Incr Delay (d2), s/veh	1.8	2.2	10.7	13.2	0.0	0.9	0.8	0.9	0.8	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	5.7	8.4	4.0	0.0	0.5	1.7	10.1	10.4	0.3	16.7	17.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	58.7	69.3	81.2	0.0	67.2	14.7	8.3	8.3	10.6	15.4	15.5
LnGrp LOS	E	E	E	F	A	E	B	A	A	B	B	B
Approach Vol, veh/h		305			62			1102			1542	
Approach Delay, s/veh		63.1			79.4			8.8			15.4	
Approach LOS		E			E			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	105.5		12.2		116.7		21.2				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	4.2	39.8		6.4		17.6		14.1				
Green Ext Time (p_c), s	0.0	8.7		0.2		8.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	217	1160	43	54	1231
Future Volume (veh/h)	215	217	1160	43	54	1231
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	226	228	1221	45	57	1296
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	539	294	2384	88	326	2673
Arrive On Green	0.16	0.16	0.68	0.68	0.03	0.75
Sat Flow, veh/h	3401	1560	3589	129	1781	3647
Grp Volume(v), veh/h	226	228	620	646	57	1296
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1847	1781	1777
Q Serve(g_s), s	9.0	20.8	25.6	25.6	1.4	21.3
Cycle Q Clear(g_c), s	9.0	20.8	25.6	25.6	1.4	21.3
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	539	294	1212	1260	326	2673
V/C Ratio(X)	0.42	0.77	0.51	0.51	0.18	0.48
Avail Cap(c_a), veh/h	667	353	1212	1260	497	2673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.44	0.44	1.00	1.00
Uniform Delay (d), s/veh	56.9	57.8	11.7	11.7	8.8	7.2
Incr Delay (d2), s/veh	0.5	8.6	0.7	0.7	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.1	24.8	13.6	14.1	0.9	12.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.4	66.4	12.3	12.3	9.0	7.9
LnGrp LOS	E	E	B	B	A	A
Approach Vol, veh/h	454		1266			1353
Approach Delay, s/veh	61.9		12.3			7.9
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		119.6		30.4	10.5	109.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		23.3		22.8	3.4	27.6
Green Ext Time (p_c), s		15.0		0.9	0.1	12.3

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Future Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	452	0	241	317	4	202	0	0	0	0	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	975		548	1196	15	234	0		0	0	92
Arrive On Green	0.00	0.53	0.00	0.08	0.66	0.66	0.13	0.00	0.00	0.00	0.00	0.06
Sat Flow, veh/h	0	1841	0	1753	1814	23	1753	202		0	0	1560
Grp Volume(v), veh/h	0	452	0	241	0	321	202	60.7		0	0	37
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	975		548	0	1211	234			0	0	92
V/C Ratio(X)	0.00	0.46		0.44	0.00	0.26	0.86			0.00	0.00	0.40
Avail Cap(c_a), veh/h	0	975		697	0	1211	463			0	0	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	0.0	12.2	0.0	8.5	51.5			0.0	0.0	55.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.6	0.0	0.5	9.2			0.0	0.0	2.8
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
%ile BackOfQ(95%),veh/ln	0.0	12.9	0.0	5.0	0.0	6.3	10.8			0.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.3	0.0	12.7	0.0	9.1	60.7			0.0	0.0	57.9
LnGrp LOS	A	B		B	A	A	E			A	A	E
Approach Vol, veh/h		452	A		562						37	
Approach Delay, s/veh		19.3			10.6						57.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	22.2	13.1	15.7	70.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		10.7	15.7	4.8	9.2	20.6						
Green Ext Time (p_c), s		2.2	0.5	0.0	0.5	3.1						

Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Notes

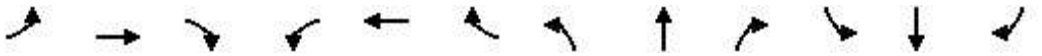
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	570	40	46	508	32	40
Future Volume (veh/h)	570	40	46	508	32	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	600	42	48	535	34	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	669	360	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.61	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	600	42	48	535	34	42
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.9	0.7	0.6	7.5	0.8	1.1
Cycle Q Clear(g_c), s	12.9	0.7	0.6	7.5	0.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	669	360	1114	226	201
V/C Ratio(X)	0.76	0.06	0.13	0.48	0.15	0.21
Avail Cap(c_a), veh/h	2077	1760	540	2590	451	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	7.8	8.0	5.1	18.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.4	0.3	3.2	0.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	7.8	8.2	5.4	18.3	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	642			583	76	
Approach Delay, s/veh	12.5			5.7	18.5	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		9.5		3.1	2.6	14.9
Green Ext Time (p_c), s		4.1		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

2045 No Build Intersection LOS Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	702	81	128	281	79	27	192	1397	266	66	1482	516
Future Volume (veh/h)	702	81	128	281	79	27	192	1397	266	66	1482	516
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	480	448	135	296	83	28	202	1471	280	69	1560	543
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	362	281	85	228	64	22	139	1270	237	107	1037	341
Arrive On Green	0.21	0.21	0.21	0.18	0.18	0.18	0.10	0.85	0.85	0.03	0.39	0.39
Sat Flow, veh/h	1753	1358	409	1276	358	121	1781	2989	557	1781	2628	863
Grp Volume(v), veh/h	480	0	583	407	0	0	202	862	889	69	1025	1078
Grp Sat Flow(s),veh/h/ln	1753	0	1767	1755	0	0	1781	1777	1770	1781	1777	1715
Q Serve(g_s), s	31.0	0.0	31.0	26.8	0.0	0.0	7.7	63.7	63.7	3.5	59.2	59.2
Cycle Q Clear(g_c), s	31.0	0.0	31.0	26.8	0.0	0.0	7.7	63.7	63.7	3.5	59.2	59.2
Prop In Lane	1.00		0.23	0.73		0.07	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	362	0	365	314	0	0	139	755	752	107	701	677
V/C Ratio(X)	1.32	0.00	1.60	1.30	0.00	0.00	1.45	1.14	1.18	0.64	1.46	1.59
Avail Cap(c_a), veh/h	362	0	365	314	0	0	139	755	752	107	701	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.72	0.72	0.72	0.71	0.71	0.71
Uniform Delay (d), s/veh	59.5	0.0	59.5	61.6	0.0	0.0	37.4	11.3	11.3	37.2	45.4	45.4
Incr Delay (d2), s/veh	164.2	0.0	281.0	155.6	0.0	0.0	228.4	75.7	92.2	8.9	213.1	272.0
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(95%),veh/ln	45.1	0.0	64.9	38.2	0.0	0.0	18.2	29.4	34.5	3.2	98.9	114.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	223.7	0.0	340.5	217.2	0.0	0.0	265.9	87.0	103.5	46.1	258.5	317.4
LnGrp LOS	F	A	F	F	A	A	F	F	F	D	F	F
Approach Vol, veh/h		1063			407			1953			2172	
Approach Delay, s/veh		287.8			217.2			113.0			281.0	
Approach LOS		F			F			F			F	

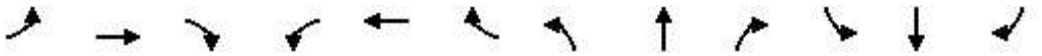
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	66.0		33.0	9.5	70.5		37.0				
Change Period (Y+Rc), s	* 6.3	6.8		* 6.2	4.5	6.8		6.0				
Max Green Setting (Gmax), s	* 7.7	59.2		* 27	5.0	63.7		31.0				
Max Q Clear Time (g_c+I1), s	9.7	61.2		28.8	5.5	65.7		33.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		219.0
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Future Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	0	93	21	35	33	121	1597	23	22	1764	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	322	0	143	30	51	70	167	2646	38	212	2295	96
Arrive On Green	0.09	0.00	0.09	0.04	0.04	0.04	0.03	0.74	0.74	0.44	0.44	0.44
Sat Flow, veh/h	3506	0	1560	678	1129	1560	1781	3586	52	312	3476	145
Grp Volume(v), veh/h	258	0	93	56	0	33	121	790	830	22	897	941
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1807	0	1560	1781	1777	1861	312	1777	1844
Q Serve(g_s), s	10.8	0.0	8.6	4.6	0.0	3.1	3.2	31.5	31.6	7.2	63.8	64.9
Cycle Q Clear(g_c), s	10.8	0.0	8.6	4.6	0.0	3.1	3.2	31.5	31.6	27.2	63.8	64.9
Prop In Lane	1.00		1.00	0.37		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	322	0	143	81	0	70	167	1311	1373	212	1173	1218
V/C Ratio(X)	0.80	0.00	0.65	0.69	0.00	0.47	0.72	0.60	0.60	0.10	0.76	0.77
Avail Cap(c_a), veh/h	584	0	260	373	0	322	196	1311	1373	212	1173	1218
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	66.8	0.0	65.8	70.6	0.0	69.9	32.8	9.3	9.3	28.6	32.0	32.3
Incr Delay (d2), s/veh	4.6	0.0	4.9	9.9	0.0	4.8	10.4	2.1	2.0	0.1	0.4	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(95%),veh/ln	8.8	0.0	6.6	4.2	0.0	2.4	6.4	17.9	18.7	1.0	31.7	33.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.4	0.0	70.6	80.5	0.0	74.7	43.1	11.4	11.3	28.7	32.4	32.7
LnGrp LOS	E	A	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		351			89			1741			1860	
Approach Delay, s/veh		71.2			78.3			13.5			32.5	
Approach LOS		E			E			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.6	105.8		12.7		117.5		19.8				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	5.2	66.9		6.6		33.6		12.8				
Green Ext Time (p_c), s	0.1	0.0		0.3		18.0		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			28.7									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	102	1716	279	289	1892
Future Volume (veh/h)	98	102	1716	279	289	1892
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	107	1806	294	304	1992
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	250	338	2010	318	328	2975
Arrive On Green	0.07	0.07	0.65	0.65	0.14	0.84
Sat Flow, veh/h	3401	1560	3166	487	1781	3647
Grp Volume(v), veh/h	103	107	1023	1077	304	1992
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1783	1781	1777
Q Serve(g_s), s	4.3	8.7	70.4	79.2	19.1	31.1
Cycle Q Clear(g_c), s	4.3	8.7	70.4	79.2	19.1	31.1
Prop In Lane	1.00	1.00		0.27	1.00	
Lane Grp Cap(c), veh/h	250	338	1162	1166	328	2975
V/C Ratio(X)	0.41	0.32	0.88	0.92	0.93	0.67
Avail Cap(c_a), veh/h	395	404	1162	1166	381	2975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	66.4	49.4	21.2	22.7	53.4	4.5
Incr Delay (d2), s/veh	1.1	0.5	1.0	1.6	26.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	12.6	30.8	34.7	19.9	14.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	49.9	22.2	24.3	79.8	5.7
LnGrp LOS	E	D	C	C	E	A
Approach Vol, veh/h	210		2100			2296
Approach Delay, s/veh	58.6		23.3			15.5
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		132.4		17.6	27.5	104.9
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		33.1		10.7	21.1	81.2
Green Ext Time (p_c), s		37.8		0.4	0.4	5.5

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Future Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	527	0	219	499	3	302	0	0	0	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	779		393	1047	6	340	0		0	0	24
Arrive On Green	0.00	0.42	0.00	0.08	0.57	0.57	0.19	0.00	0.00	0.00	0.00	0.02
Sat Flow, veh/h	0	1841	0	1753	1828	11	1753	302		0	0	1560
Grp Volume(v), veh/h	0	527	0	219	0	502	302	53.5		0	0	6
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1839	1753	D		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	5.4	0.0	12.9	13.5			0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	18.6	0.0	5.4	0.0	12.9	13.5			0.0	0.0	0.3
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	779		393	0	1053	340			0	0	24
V/C Ratio(X)	0.00	0.68		0.56	0.00	0.48	0.89			0.00	0.00	0.25
Avail Cap(c_a), veh/h	0	779		393	0	1053	360			0	0	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	18.7	0.0	13.8	0.0	10.1	31.5			0.0	0.0	39.1
Incr Delay (d2), s/veh	0.0	4.7	0.0	1.8	0.0	1.5	22.0			0.0	0.0	5.2
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
%ile BackOfQ(95%),veh/ln	0.0	13.1	0.0	3.8	0.0	8.7	12.1			0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.4	0.0	15.6	0.0	11.6	53.5			0.0	0.0	44.2
LnGrp LOS	A	C		B	A	B	D			A	A	D
Approach Vol, veh/h		527	A		721						6	
Approach Delay, s/veh		23.4			12.8						44.2	
Approach LOS		C			B						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		52.0	21.4	7.0	12.0	40.0						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		46.0	* 17	* 10	* 6.3	34.0						
Max Q Clear Time (g_c+I1), s		14.9	15.5	2.3	7.4	20.6						
Green Ext Time (p_c), s		3.6	0.1	0.0	0.0	2.9						

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Notes

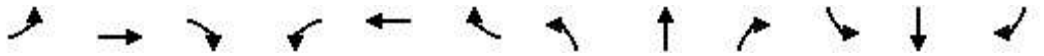
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	775	70	132	690	17	24
Future Volume (veh/h)	775	70	132	690	17	24
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	74	139	726	18	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	827	343	1289	171	153
Arrive On Green	0.53	0.53	0.07	0.70	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	816	74	139	726	18	25
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	23.0	1.4	1.9	12.0	0.6	0.9
Cycle Q Clear(g_c), s	23.0	1.4	1.9	12.0	0.6	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	827	343	1289	171	153
V/C Ratio(X)	0.84	0.09	0.41	0.56	0.11	0.16
Avail Cap(c_a), veh/h	1758	1489	416	2147	171	153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.1	11.0	4.6	25.2	25.4
Incr Delay (d2), s/veh	2.0	0.0	0.8	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.7	1.4	5.1	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	7.2	11.7	4.9	25.5	25.9
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	890			865	43	
Approach Delay, s/veh	13.6			6.0	25.7	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		12.0	10.4	38.9
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		14.0		2.9	3.9	25.0
Green Ext Time (p_c), s		6.4		0.0	0.1	7.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B



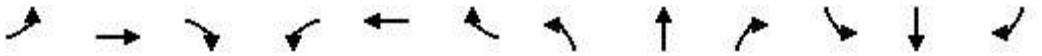
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	523	97	267	288	151	45	177	1106	294	85	1448	566
Future Volume (veh/h)	523	97	267	288	151	45	177	1106	294	85	1448	566
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	467	220	281	303	159	47	186	1164	309	89	1524	596
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	362	151	193	208	109	32	131	983	258	126	879	322
Arrive On Green	0.21	0.21	0.21	0.20	0.20	0.20	0.04	0.35	0.35	0.04	0.35	0.35
Sat Flow, veh/h	1753	734	938	1047	550	162	1781	2785	731	1781	2546	933
Grp Volume(v), veh/h	467	0	501	509	0	0	186	738	735	89	1033	1087
Grp Sat Flow(s),veh/h/ln	1753	0	1672	1759	0	0	1781	1777	1739	1781	1777	1702
Q Serve(g_s), s	26.4	0.0	26.4	25.4	0.0	0.0	5.4	45.2	45.2	4.1	44.2	44.2
Cycle Q Clear(g_c), s	26.4	0.0	26.4	25.4	0.0	0.0	5.4	45.2	45.2	4.1	44.2	44.2
Prop In Lane	1.00		0.56	0.60		0.09	1.00		0.42	1.00		0.55
Lane Grp Cap(c), veh/h	362	0	345	349	0	0	131	627	614	126	614	588
V/C Ratio(X)	1.29	0.00	1.45	1.46	0.00	0.00	1.42	1.18	1.20	0.71	1.68	1.85
Avail Cap(c_a), veh/h	362	0	345	349	0	0	131	627	614	126	614	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.78	0.78	0.78	0.67	0.67	0.67
Uniform Delay (d), s/veh	50.8	0.0	50.8	51.3	0.0	0.0	37.2	41.4	41.4	33.2	41.9	41.9
Incr Delay (d2), s/veh	150.4	0.0	219.3	221.4	0.0	0.0	218.2	91.9	101.2	11.5	312.3	386.7
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(95%),veh/ln	39.8	0.0	48.9	49.7	0.0	0.0	16.7	48.4	49.9	3.8	108.5	124.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	201.2	0.0	270.1	272.7	0.0	0.0	255.4	133.3	142.6	44.7	354.2	428.6
LnGrp LOS	F	A	F	F	A	A	F	F	F	D	F	F
Approach Vol, veh/h		968			509			1659			2209	
Approach Delay, s/veh		236.9			272.7			151.1			378.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	51.0		32.0	11.0	52.0		33.0				
Change Period (Y+Rc), s	6.6	6.8		6.6	6.0	6.8		6.6				
Max Green Setting (Gmax), s	5.4	44.2		25.4	5.0	45.2		26.4				
Max Q Clear Time (g_c+I1), s	7.4	46.2		27.4	6.1	47.2		28.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		272.1	
HCM 6th LOS		F	

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Future Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	103	178	41	27	11	115	1472	39	14	1765	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	233	245	207	55	36	80	165	2443	65	211	2127	87
Arrive On Green	0.13	0.13	0.13	0.05	0.05	0.05	0.04	0.69	0.69	0.61	0.61	0.61
Sat Flow, veh/h	1753	1841	1560	1077	709	1560	1781	3537	94	346	3478	143
Grp Volume(v), veh/h	86	103	178	68	0	11	115	739	772	14	897	941
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1787	0	1560	1781	1777	1854	346	1777	1845
Q Serve(g_s), s	6.7	7.7	16.8	5.6	0.0	1.0	3.5	33.0	33.2	3.4	59.4	60.7
Cycle Q Clear(g_c), s	6.7	7.7	16.8	5.6	0.0	1.0	3.5	33.0	33.2	24.6	59.4	60.7
Prop In Lane	1.00		1.00	0.60		1.00	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	233	245	207	91	0	80	165	1227	1280	211	1086	1128
V/C Ratio(X)	0.37	0.42	0.86	0.74	0.00	0.14	0.69	0.60	0.60	0.07	0.83	0.83
Avail Cap(c_a), veh/h	374	393	333	381	0	333	190	1227	1280	211	1086	1128
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	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	59.3	59.7	63.7	70.2	0.0	68.0	31.4	12.3	12.3	22.0	22.9	23.1
Incr Delay (d2), s/veh	1.0	1.2	12.0	11.3	0.0	0.8	8.8	2.2	2.1	0.1	0.7	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(95%),veh/ln	5.5	6.7	11.8	5.2	0.0	0.8	5.5	19.4	20.1	0.5	26.7	28.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	60.9	75.7	81.5	0.0	68.8	40.3	14.5	14.4	22.0	23.6	23.8
LnGrp LOS	E	E	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		367			79			1626			1852	
Approach Delay, s/veh		67.9			79.8			16.3			23.7	
Approach LOS		E			E			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.9	98.5		13.7		110.4		25.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	5.5	62.7		7.6		35.2		18.8				
Green Ext Time (p_c), s	0.0	0.0		0.3		14.4		1.2				

Intersection Summary			
HCM 6th Ctrl Delay		25.9	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	287	1701	54	67	1775
Future Volume (veh/h)	302	287	1701	54	67	1775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	302	1791	57	71	1868
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	667	355	2261	72	172	2540
Arrive On Green	0.20	0.20	0.64	0.64	0.03	0.71
Sat Flow, veh/h	3401	1560	3609	111	1781	3647
Grp Volume(v), veh/h	318	302	901	947	71	1868
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1850	1781	1777
Q Serve(g_s), s	12.4	27.8	55.1	56.1	1.9	47.4
Cycle Q Clear(g_c), s	12.4	27.8	55.1	56.1	1.9	47.4
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	667	355	1143	1190	172	2540
V/C Ratio(X)	0.48	0.85	0.79	0.80	0.41	0.74
Avail Cap(c_a), veh/h	667	355	1143	1190	341	2540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	53.5	55.5	19.4	19.6	23.3	12.9
Incr Delay (d2), s/veh	0.5	17.5	0.5	0.5	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	32.1	24.4	25.8	2.5	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	73.0	19.9	20.1	24.9	14.8
LnGrp LOS	D	E	B	C	C	B
Approach Vol, veh/h	620		1848			1939
Approach Delay, s/veh	63.3		20.0			15.2
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.0		36.0	10.7	103.3
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		49.4		29.8	3.9	58.1
Green Ext Time (p_c), s		28.3		0.0	0.1	16.2

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

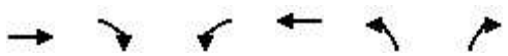
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Future Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	621	0	341	467	6	244	0	0	0	0	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	866		420	1151	15	275	0		0	0	103
Arrive On Green	0.00	0.47	0.00	0.12	0.63	0.63	0.16	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1813	23	1753	244		0	0	1560
Grp Volume(v), veh/h	0	621	0	341	0	473	244	64.3		0	0	51
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Cycle Q Clear(g_c), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	866		420	0	1165	275			0	0	103
V/C Ratio(X)	0.00	0.72		0.81	0.00	0.41	0.89			0.00	0.00	0.50
Avail Cap(c_a), veh/h	0	866		494	0	1165	445			0	0	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.7	0.0	21.4	0.0	11.3	52.1			0.0	0.0	56.8
Incr Delay (d2), s/veh	0.0	5.1	0.0	8.6	0.0	1.1	12.2			0.0	0.0	3.6
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
%ile BackOfQ(95%),veh/ln	0.0	22.4	0.0	9.6	0.0	10.9	13.3			0.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.7	0.0	30.0	0.0	12.4	64.3			0.0	0.0	60.5
LnGrp LOS	A	C		C	A	B	E			A	A	E
Approach Vol, veh/h		621	A		814						51	
Approach Delay, s/veh		31.7			19.8						60.5	
Approach LOS		C			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	25.8	14.3	20.7	65.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		18.0	19.2	6.0	14.1	36.0						
Green Ext Time (p_c), s		3.5	0.6	0.1	0.6	4.0						

Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	55	66	759	44	54
Future Volume (veh/h)	766	55	66	759	44	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	806	58	69	799	46	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	968	820	323	1260	180	160
Arrive On Green	0.53	0.53	0.06	0.68	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	806	58	69	799	46	57
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	21.6	1.1	0.9	14.1	1.4	2.0
Cycle Q Clear(g_c), s	21.6	1.1	0.9	14.1	1.4	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	968	820	323	1260	180	160
V/C Ratio(X)	0.83	0.07	0.21	0.63	0.26	0.36
Avail Cap(c_a), veh/h	1660	1407	435	2070	361	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	6.8	9.8	5.1	24.1	24.4
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.5	0.6	6.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	6.9	10.1	5.7	24.8	25.7
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	864			868	103	
Approach Delay, s/veh	13.2			6.0	25.3	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.3		12.0	9.3	37.1
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		16.1		4.0	2.9	23.6
Green Ext Time (p_c), s		7.4		0.1	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

APPENDIX J

(Build Alternative 1 Intersection LOS Results)

2025 Build Alternative 1 Intersection LOS Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	475	65	78	196	55	11	140	956	195	26	1031	350
Future Volume (veh/h)	475	65	78	196	55	11	140	956	195	26	1031	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	500	68	82	206	58	12	147	1006	205	27	1085	368
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	571	160	224	326	84	106	195	2158	1163	297	1995	2034
Arrive On Green	0.17	0.09	0.09	0.13	0.05	0.05	0.06	0.61	0.61	0.02	0.56	0.56
Sat Flow, veh/h	3401	1841	1560	1753	1841	1560	3456	3554	1585	1781	3554	2790
Grp Volume(v), veh/h	500	68	82	206	58	12	147	1006	205	27	1085	368
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	1841	1560	1728	1777	1585	1781	1777	1395
Q Serve(g_s), s	21.5	5.3	7.1	16.5	4.7	1.1	6.3	23.3	5.9	1.0	28.9	6.2
Cycle Q Clear(g_c), s	21.5	5.3	7.1	16.5	4.7	1.1	6.3	23.3	5.9	1.0	28.9	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	571	160	224	326	84	106	195	2158	1163	297	1995	2034
V/C Ratio(X)	0.88	0.42	0.37	0.63	0.69	0.11	0.75	0.47	0.18	0.09	0.54	0.18
Avail Cap(c_a), veh/h	880	358	392	475	270	264	316	2158	1163	316	1995	2034
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	0.91	0.91	0.91	0.89	0.89	0.89
Uniform Delay (d), s/veh	60.9	64.9	58.1	58.2	70.5	65.6	69.7	16.1	6.1	14.1	20.8	6.3
Incr Delay (d2), s/veh	6.5	1.8	1.0	2.0	9.6	0.5	5.3	0.7	0.3	0.1	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	15.0	4.6	5.2	12.1	4.4	0.8	5.3	14.5	3.6	0.7	17.7	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	66.7	59.1	60.2	80.1	66.1	75.1	16.8	6.4	14.3	21.7	6.5
LnGrp LOS	E	E	E	E	F	E	E	B	A	B	C	A
Approach Vol, veh/h		650			276			1358			1480	
Approach Delay, s/veh		66.2			64.7			21.5			17.8	
Approach LOS		E			E			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	91.0	31.2	13.1	7.9	97.9	25.0	19.2
Change Period (Y+Rc), s	* 6.3	6.8	6.0	* 6.2	4.5	6.8	6.0	* 6.2
Max Green Setting (Gmax), s	* 14	50.2	38.8	* 22	5.0	60.7	31.8	* 29
Max Q Clear Time (g_c+I1), s	8.3	30.9	23.5	6.7	3.0	25.3	18.5	9.1
Green Ext Time (p_c), s	0.2	9.5	1.7	0.2	0.0	10.0	0.5	0.5

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Future Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	122	56	12	28	21	84	1069	15	16	1192	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	148	155	132	20	47	57	335	2703	38	386	2360	97
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	0.03	0.75	0.75	0.68	0.68	0.68
Sat Flow, veh/h	1753	1841	1560	544	1269	1560	1781	3588	50	520	3479	143
Grp Volume(v), veh/h	98	122	56	40	0	21	84	529	555	16	609	632
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1814	0	1560	1781	1777	1861	520	1777	1845
Q Serve(g_s), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	1.7	25.1	25.2
Cycle Q Clear(g_c), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	6.1	25.1	25.2
Prop In Lane	1.00		1.00	0.30		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	148	155	132	67	0	57	335	1339	1402	386	1206	1252
V/C Ratio(X)	0.66	0.79	0.43	0.60	0.00	0.37	0.25	0.40	0.40	0.04	0.50	0.51
Avail Cap(c_a), veh/h	292	307	260	375	0	322	367	1339	1402	386	1206	1252
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	0.00	1.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	66.6	67.3	65.2	71.1	0.0	70.5	9.0	6.5	6.5	9.5	11.8	11.8
Incr Delay (d2), s/veh	5.0	8.5	2.2	8.3	0.0	3.8	0.4	0.9	0.8	0.2	1.2	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(95%),veh/ln	7.0	8.6	3.8	3.0	0.0	1.5	1.4	9.9	10.2	0.4	14.8	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	75.8	67.4	79.4	0.0	74.4	9.4	7.4	7.3	9.7	13.0	13.0
LnGrp LOS	E	E	E	E	A	E	A	A	A	A	B	B
Approach Vol, veh/h		276			61			1168			1257	
Approach Delay, s/veh		72.6			77.7			7.5			12.9	
Approach LOS		E			E			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	108.6		11.5		119.8		18.6				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	4.0	27.2		5.3		17.7		11.7				
Green Ext Time (p_c), s	0.0	11.1		0.2		9.5		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			18.0									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	78	1153	211	217	1289
Future Volume (veh/h)	74	78	1153	211	217	1289
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	82	1214	222	228	1357
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	220	169	2289	416	349	3007
Arrive On Green	0.06	0.06	0.76	0.76	0.04	0.85
Sat Flow, veh/h	3401	1560	3097	545	1781	3647
Grp Volume(v), veh/h	78	82	715	721	228	1357
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1772	1781	1777
Q Serve(g_s), s	3.3	7.4	24.0	24.5	4.0	14.3
Cycle Q Clear(g_c), s	3.3	7.4	24.0	24.5	4.0	14.3
Prop In Lane	1.00	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	220	169	1354	1351	349	3007
V/C Ratio(X)	0.36	0.48	0.53	0.53	0.65	0.45
Avail Cap(c_a), veh/h	395	249	1354	1351	580	3007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	67.2	62.9	7.1	7.2	8.8	2.9
Incr Delay (d2), s/veh	1.0	2.1	1.2	1.2	2.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	10.8	13.2	13.4	5.1	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	65.1	8.3	8.4	10.9	3.4
LnGrp LOS	E	E	A	A	B	A
Approach Vol, veh/h	160		1436			1585
Approach Delay, s/veh	66.6		8.3			4.5
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.7		16.3	12.6	121.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		16.3		9.4	6.0	26.5
Green Ext Time (p_c), s		16.5		0.3	0.6	16.2

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Future Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	356	0	146	339	1	204	0	222	0	0	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	876		562	1130	3	248	0	0	0	0	13
Arrive On Green	0.00	0.48	0.00	0.06	0.62	0.62	0.14	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	0	1841	0	1753	1834	5	1753	204		0	0	1560
Grp Volume(v), veh/h	0	356	0	146	0	340	204	39.0		0	0	3
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1840	1753	D		0	0	1560
Q Serve(g_s), s	0.0	9.4	0.0	2.9	0.0	6.5	8.4			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	9.4	0.0	2.9	0.0	6.5	8.4			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	876		562	0	1133	248			0	0	13
V/C Ratio(X)	0.00	0.41		0.26	0.00	0.30	0.82			0.00	0.00	0.24
Avail Cap(c_a), veh/h	0	876		598	0	1133	387			0	0	209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.7	0.0	8.7	0.0	6.8	31.1			0.0	0.0	36.8
Incr Delay (d2), s/veh	0.0	1.4	0.0	0.2	0.0	0.7	7.9			0.0	0.0	9.4
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
%ile BackOfQ(95%),veh/ln	0.0	7.0	0.0	1.8	0.0	4.2	7.2			0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.1	0.0	8.9	0.0	7.4	39.0			0.0	0.0	46.2
LnGrp LOS	A	B		A	A	A	D			A	A	D
Approach Vol, veh/h		356	A		486						3	
Approach Delay, s/veh		14.1			7.9						46.2	
Approach LOS		B			A						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		52.0	16.4	6.3	10.5	41.5						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		46.0	* 17	* 10	* 6.3	34.0						
Max Q Clear Time (g_c+I1), s		8.5	10.4	2.1	4.9	11.4						
Green Ext Time (p_c), s		2.3	0.3	0.0	0.0	2.2						

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Notes

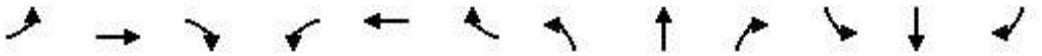
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	44	90	458	11	16
Future Volume (veh/h)	526	44	90	458	11	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	554	46	95	482	12	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	769	652	416	1133	220	195
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	554	46	95	482	12	17
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.0	0.8	1.3	6.5	0.3	0.5
Cycle Q Clear(g_c), s	12.0	0.8	1.3	6.5	0.3	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	652	416	1133	220	195
V/C Ratio(X)	0.72	0.07	0.23	0.43	0.05	0.09
Avail Cap(c_a), veh/h	2253	1909	545	2752	220	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	8.4	7.8	4.8	18.4	18.5
Incr Delay (d2), s/veh	1.3	0.0	0.3	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	0.4	0.6	2.7	0.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	8.4	8.1	5.0	18.5	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	600			577	29	
Approach Delay, s/veh	12.6			5.5	18.6	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.9		12.0	9.5	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		8.5		2.5	3.3	14.0
Green Ext Time (p_c), s		3.5		0.0	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	395	70	204	200	106	20	127	745	219	35	1054	367
Future Volume (veh/h)	395	70	204	200	106	20	127	745	219	35	1054	367
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	416	74	215	211	112	21	134	784	231	37	1109	386
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	485	264	304	375	224	231	179	1920	1048	323	1815	1822
Arrive On Green	0.14	0.14	0.14	0.12	0.12	0.12	0.05	0.54	0.54	0.03	0.51	0.51
Sat Flow, veh/h	3401	1841	1560	1753	1841	1560	3456	3554	1585	1781	3554	2790
Grp Volume(v), veh/h	416	74	215	211	112	21	134	784	231	37	1109	386
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	1841	1560	1728	1777	1585	1781	1777	1395
Q Serve(g_s), s	17.9	5.4	19.3	15.5	8.5	1.7	5.7	19.5	8.7	1.5	33.3	8.4
Cycle Q Clear(g_c), s	17.9	5.4	19.3	15.5	8.5	1.7	5.7	19.5	8.7	1.5	33.3	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	485	264	304	375	224	231	179	1920	1048	323	1815	1822
V/C Ratio(X)	0.86	0.28	0.71	0.56	0.50	0.09	0.75	0.41	0.22	0.11	0.61	0.21
Avail Cap(c_a), veh/h	907	282	320	624	275	274	217	1920	1048	383	1815	1822
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	0.92	0.92	0.92	0.87	0.87	0.87
Uniform Delay (d), s/veh	62.8	57.3	56.4	48.9	61.6	55.2	70.2	20.3	10.1	17.2	26.1	10.5
Incr Delay (d2), s/veh	4.5	0.6	6.6	1.3	1.7	0.2	10.2	0.6	0.4	0.1	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.8	4.6	12.9	11.3	7.4	1.3	5.1	12.9	5.7	1.1	20.2	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	57.9	62.9	50.3	63.3	55.4	80.3	20.9	10.5	17.4	27.4	10.7
LnGrp LOS	E	E	E	D	E	E	F	C	B	B	C	B
Approach Vol, veh/h		705			344			1149			1532	
Approach Delay, s/veh		65.0			54.8			25.8			23.0	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	83.4	27.4	24.8	9.9	87.8	24.1	28.1
Change Period (Y+Rc), s	6.6	6.8	6.0	6.6	6.0	6.8	6.0	6.6
Max Green Setting (Gmax), s	9.4	52.2	40.0	22.4	9.0	53.2	39.4	23.0
Max Q Clear Time (g_c+I1), s	7.7	35.3	19.9	10.5	3.5	21.5	17.5	21.3
Green Ext Time (p_c), s	0.1	9.1	1.4	0.4	0.0	7.3	0.6	0.2

Intersection Summary	
HCM 6th Ctrl Delay	34.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Future Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	95	131	29	25	8	83	993	26	12	1462	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	180	189	160	40	34	65	242	2585	68	394	2267	105
Arrive On Green	0.10	0.10	0.10	0.04	0.04	0.04	0.03	0.73	0.73	0.66	0.66	0.66
Sat Flow, veh/h	1753	1841	1560	963	830	1560	1781	3538	93	553	3458	160
Grp Volume(v), veh/h	79	95	131	54	0	8	83	499	520	12	749	781
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1793	0	1560	1781	1777	1854	553	1777	1841
Q Serve(g_s), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	1.2	37.7	38.0
Cycle Q Clear(g_c), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	5.8	37.7	38.0
Prop In Lane	1.00		1.00	0.54		1.00	1.00		0.05	1.00		0.09
Lane Grp Cap(c), veh/h	180	189	160	74	0	65	242	1298	1354	394	1165	1207
V/C Ratio(X)	0.44	0.50	0.82	0.73	0.00	0.12	0.34	0.38	0.38	0.03	0.64	0.65
Avail Cap(c_a), veh/h	374	393	333	382	0	333	275	1298	1354	394	1165	1207
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	0.00	1.00	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	63.2	63.7	65.9	71.1	0.0	69.3	14.1	7.6	7.6	10.8	15.4	15.4
Incr Delay (d2), s/veh	1.7	2.1	9.7	12.7	0.0	0.9	0.8	0.9	0.8	0.1	2.1	2.1
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(95%),veh/ln	5.3	6.4	9.2	4.2	0.0	0.6	1.7	10.2	10.5	0.3	21.2	22.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	65.7	75.7	83.8	0.0	70.1	14.9	8.4	8.4	10.9	17.5	17.5
LnGrp LOS	E	E	E	F	A	E	B	A	A	B	B	B
Approach Vol, veh/h		305			62			1102			1542	
Approach Delay, s/veh		69.8			82.0			8.9			17.5	
Approach LOS		E			F			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	105.1		12.2		116.4		21.4				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	4.2	40.0		6.5		17.8		14.3				
Green Ext Time (p_c), s	0.0	8.6		0.2		8.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	217	1160	43	54	1231
Future Volume (veh/h)	215	217	1160	43	54	1231
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	226	228	1221	45	57	1296
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	539	294	2384	88	326	2673
Arrive On Green	0.16	0.16	0.68	0.68	0.03	0.75
Sat Flow, veh/h	3401	1560	3589	129	1781	3647
Grp Volume(v), veh/h	226	228	620	646	57	1296
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1847	1781	1777
Q Serve(g_s), s	9.0	20.8	25.6	25.6	1.4	21.3
Cycle Q Clear(g_c), s	9.0	20.8	25.6	25.6	1.4	21.3
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	539	294	1212	1260	326	2673
V/C Ratio(X)	0.42	0.77	0.51	0.51	0.18	0.48
Avail Cap(c_a), veh/h	667	353	1212	1260	497	2673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	56.9	57.8	11.7	11.7	8.8	7.2
Incr Delay (d2), s/veh	0.5	8.6	1.3	1.3	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.1	24.8	15.2	15.7	0.9	12.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.4	66.4	13.0	12.9	9.0	7.9
LnGrp LOS	E	E	B	B	A	A
Approach Vol, veh/h	454		1266			1353
Approach Delay, s/veh	61.9		12.9			7.9
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		119.6		30.4	10.5	109.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		23.3		22.8	3.4	27.6
Green Ext Time (p_c), s		15.0		0.9	0.1	12.3

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

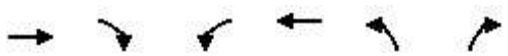
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Future Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	452	0	241	317	4	202	0	181	0	0	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	975		548	1196	15	234	0	0	0	0	92
Arrive On Green	0.00	0.53	0.00	0.08	0.66	0.66	0.13	0.00	0.00	0.00	0.00	0.06
Sat Flow, veh/h	0	1841	0	1753	1814	23	1753	202		0	0	1560
Grp Volume(v), veh/h	0	452	0	241	0	321	202	60.7		0	0	37
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	975		548	0	1211	234			0	0	92
V/C Ratio(X)	0.00	0.46		0.44	0.00	0.26	0.86			0.00	0.00	0.40
Avail Cap(c_a), veh/h	0	975		697	0	1211	463			0	0	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	0.0	12.2	0.0	8.5	51.5			0.0	0.0	55.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.6	0.0	0.5	9.2			0.0	0.0	2.8
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
%ile BackOfQ(95%),veh/ln	0.0	12.9	0.0	5.0	0.0	6.3	10.8			0.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.3	0.0	12.7	0.0	9.1	60.7			0.0	0.0	57.9
LnGrp LOS	A	B		B	A	A	E			A	A	E
Approach Vol, veh/h		452	A		562						37	
Approach Delay, s/veh		19.3			10.6						57.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	22.2	13.1	15.7	70.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		10.7	15.7	4.8	9.2	20.6						
Green Ext Time (p_c), s		2.2	0.5	0.0	0.5	3.1						

Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

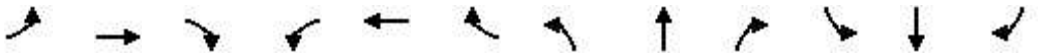


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	570	40	46	508	32	40
Future Volume (veh/h)	570	40	46	508	32	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	600	42	48	535	34	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	669	360	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.61	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	600	42	48	535	34	42
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.9	0.7	0.6	7.5	0.8	1.1
Cycle Q Clear(g_c), s	12.9	0.7	0.6	7.5	0.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	669	360	1114	226	201
V/C Ratio(X)	0.76	0.06	0.13	0.48	0.15	0.21
Avail Cap(c_a), veh/h	2077	1760	540	2590	451	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	7.8	8.0	5.1	18.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.4	0.3	3.2	0.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	7.8	8.2	5.4	18.3	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	642			583	76	
Approach Delay, s/veh	12.5			5.7	18.5	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		9.5		3.1	2.6	14.9
Green Ext Time (p_c), s		4.1		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

2045 Build Alternative 1 Intersection LOS Results



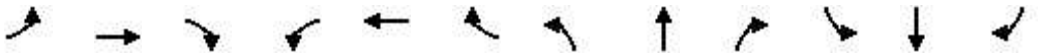
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	702	81	128	281	79	27	192	1397	266	66	1482	516
Future Volume (veh/h)	702	81	128	281	79	27	192	1397	266	66	1482	516
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	739	85	135	296	83	28	202	1471	280	69	1560	543
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	800	226	304	419	110	143	249	1835	1092	153	1649	1951
Arrive On Green	0.24	0.12	0.12	0.17	0.06	0.06	0.07	0.52	0.52	0.03	0.46	0.46
Sat Flow, veh/h	3401	1841	1560	1753	1841	1560	3456	3554	1585	1781	3554	2790
Grp Volume(v), veh/h	739	85	135	296	83	28	202	1471	280	69	1560	543
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	1841	1560	1728	1777	1585	1781	1777	1395
Q Serve(g_s), s	31.8	6.4	11.4	23.4	6.7	2.5	8.6	51.2	10.0	3.0	62.9	10.9
Cycle Q Clear(g_c), s	31.8	6.4	11.4	23.4	6.7	2.5	8.6	51.2	10.0	3.0	62.9	10.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	800	226	304	419	110	143	249	1835	1092	153	1649	1951
V/C Ratio(X)	0.92	0.38	0.44	0.71	0.75	0.20	0.81	0.80	0.26	0.45	0.95	0.28
Avail Cap(c_a), veh/h	880	358	416	488	270	278	316	1835	1092	155	1649	1951
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	0.72	0.72	0.72	0.71	0.71	0.71
Uniform Delay (d), s/veh	56.1	60.5	53.2	53.2	69.4	63.0	68.6	29.9	8.8	28.2	38.4	8.4
Incr Delay (d2), s/veh	14.4	1.0	1.0	3.8	9.8	0.7	8.8	2.8	0.4	1.5	9.7	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(95%),veh/ln	21.7	5.5	8.1	16.2	6.2	1.8	7.0	29.0	6.2	2.4	36.7	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	61.6	54.3	57.0	79.2	63.7	77.3	32.7	9.2	29.7	48.1	8.7
LnGrp LOS	E	E	D	E	E	E	E	C	A	C	D	A
Approach Vol, veh/h		959			407			1953			2172	
Approach Delay, s/veh		67.4			62.0			33.9			37.7	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	76.4	41.3	15.2	9.3	84.3	31.9	24.6
Change Period (Y+Rc), s	* 6.3	6.8	6.0	* 6.2	4.5	6.8	6.0	* 6.2
Max Green Setting (Gmax), s	* 14	50.2	38.8	* 22	5.0	60.7	31.8	* 29
Max Q Clear Time (g_c+I1), s	10.6	64.9	33.8	8.7	5.0	53.2	25.4	13.4
Green Ext Time (p_c), s	0.2	0.0	1.4	0.3	0.0	5.8	0.5	0.8

Intersection Summary	
HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Future Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	0	93	21	35	33	121	1597	23	22	1764	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	322	0	143	30	51	70	187	2646	38	212	2295	96
Arrive On Green	0.09	0.00	0.09	0.04	0.04	0.04	0.03	0.74	0.74	0.66	0.66	0.66
Sat Flow, veh/h	3506	0	1560	678	1129	1560	1781	3586	52	312	3476	145
Grp Volume(v), veh/h	258	0	93	56	0	33	121	790	830	22	897	941
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1807	0	1560	1781	1777	1861	312	1777	1844
Q Serve(g_s), s	10.8	0.0	8.6	4.6	0.0	3.1	3.2	31.5	31.6	5.4	51.9	53.1
Cycle Q Clear(g_c), s	10.8	0.0	8.6	4.6	0.0	3.1	3.2	31.5	31.6	25.4	51.9	53.1
Prop In Lane	1.00		1.00	0.37		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	322	0	143	81	0	70	187	1311	1373	212	1173	1218
V/C Ratio(X)	0.80	0.00	0.65	0.69	0.00	0.47	0.65	0.60	0.60	0.10	0.76	0.77
Avail Cap(c_a), veh/h	584	0	260	373	0	322	215	1311	1373	212	1173	1218
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.16	0.16	0.16
Uniform Delay (d), s/veh	66.8	0.0	65.8	70.6	0.0	69.9	26.2	9.3	9.3	18.1	17.5	17.7
Incr Delay (d2), s/veh	4.6	0.0	4.9	9.9	0.0	4.8	5.3	2.1	2.0	0.2	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.8	0.0	6.6	4.2	0.0	2.4	5.7	17.9	18.7	0.7	23.6	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.4	0.0	70.6	80.5	0.0	74.7	31.5	11.4	11.3	18.2	18.3	18.5
LnGrp LOS	E	A	E	F	A	E	C	B	B	B	B	B
Approach Vol, veh/h		351			89			1741			1860	
Approach Delay, s/veh		71.2			78.3			12.7			18.4	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.6	105.8		12.7		117.5		19.8				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	5.2	55.1		6.6		33.6		12.8				
Green Ext Time (p_c), s	0.1	5.2		0.3		18.0		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		21.8	
HCM 6th LOS		C	

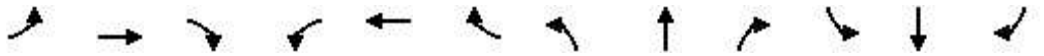
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	102	1716	279	289	1892
Future Volume (veh/h)	98	102	1716	279	289	1892
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	107	1806	294	304	1992
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	250	338	2010	318	328	2975
Arrive On Green	0.07	0.07	0.65	0.65	0.14	0.84
Sat Flow, veh/h	3401	1560	3166	487	1781	3647
Grp Volume(v), veh/h	103	107	1023	1077	304	1992
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1783	1781	1777
Q Serve(g_s), s	4.3	8.7	70.4	79.2	19.1	31.1
Cycle Q Clear(g_c), s	4.3	8.7	70.4	79.2	19.1	31.1
Prop In Lane	1.00	1.00		0.27	1.00	
Lane Grp Cap(c), veh/h	250	338	1162	1166	328	2975
V/C Ratio(X)	0.41	0.32	0.88	0.92	0.93	0.67
Avail Cap(c_a), veh/h	395	404	1162	1166	381	2975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.34	0.34	1.00	1.00
Uniform Delay (d), s/veh	66.4	49.4	21.2	22.7	53.4	4.5
Incr Delay (d2), s/veh	1.1	0.5	3.6	5.5	26.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	12.6	34.2	38.7	19.9	14.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	49.9	24.8	28.2	79.8	5.7
LnGrp LOS	E	D	C	C	E	A
Approach Vol, veh/h	210		2100			2296
Approach Delay, s/veh	58.6		26.5			15.5
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		132.4		17.6	27.5	104.9
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		33.1		10.7	21.1	81.2
Green Ext Time (p_c), s		37.8		0.4	0.4	5.5

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Future Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	527	0	219	499	3	302	0	331	0	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	779		393	1047	6	340	0	0	0	0	24
Arrive On Green	0.00	0.42	0.00	0.08	0.57	0.57	0.19	0.00	0.00	0.00	0.00	0.02
Sat Flow, veh/h	0	1841	0	1753	1828	11	1753	302		0	0	1560
Grp Volume(v), veh/h	0	527	0	219	0	502	302	53.5		0	0	6
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1839	1753	D		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	5.4	0.0	12.9	13.5			0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	18.6	0.0	5.4	0.0	12.9	13.5			0.0	0.0	0.3
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	779		393	0	1053	340			0	0	24
V/C Ratio(X)	0.00	0.68		0.56	0.00	0.48	0.89			0.00	0.00	0.25
Avail Cap(c_a), veh/h	0	779		393	0	1053	360			0	0	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	18.7	0.0	13.8	0.0	10.1	31.5			0.0	0.0	39.1
Incr Delay (d2), s/veh	0.0	4.7	0.0	1.8	0.0	1.5	22.0			0.0	0.0	5.2
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
%ile BackOfQ(95%),veh/ln	0.0	13.1	0.0	3.8	0.0	8.7	12.1			0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.4	0.0	15.6	0.0	11.6	53.5			0.0	0.0	44.2
LnGrp LOS	A	C		B	A	B	D			A	A	D
Approach Vol, veh/h		527	A		721						6	
Approach Delay, s/veh		23.4			12.8						44.2	
Approach LOS		C			B						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		52.0	21.4	7.0	12.0	40.0						
Change Period (Y+Rc), s		6.0	* 5.8	* 5.7	* 5.7	6.0						
Max Green Setting (Gmax), s		46.0	* 17	* 10	* 6.3	34.0						
Max Q Clear Time (g_c+I1), s		14.9	15.5	2.3	7.4	20.6						
Green Ext Time (p_c), s		3.6	0.1	0.0	0.0	2.9						

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Notes

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

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	775	70	132	690	17	24
Future Volume (veh/h)	775	70	132	690	17	24
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	74	139	726	18	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	827	343	1289	171	153
Arrive On Green	0.53	0.53	0.07	0.70	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	816	74	139	726	18	25
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	23.0	1.4	1.9	12.0	0.6	0.9
Cycle Q Clear(g_c), s	23.0	1.4	1.9	12.0	0.6	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	827	343	1289	171	153
V/C Ratio(X)	0.84	0.09	0.41	0.56	0.11	0.16
Avail Cap(c_a), veh/h	1758	1489	416	2147	171	153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.1	11.0	4.6	25.2	25.4
Incr Delay (d2), s/veh	2.0	0.0	0.8	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.7	1.4	5.1	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	7.2	11.7	4.9	25.5	25.9
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	890			865	43	
Approach Delay, s/veh	13.6			6.0	25.7	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		12.0	10.4	38.9
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		14.0		2.9	3.9	25.0
Green Ext Time (p_c), s		6.4		0.0	0.1	7.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	523	97	267	288	151	45	177	1106	294	85	1448	566
Future Volume (veh/h)	523	97	267	288	151	45	177	1106	294	85	1448	566
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	551	102	281	303	159	47	186	1164	309	89	1524	596
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	623	282	337	439	248	272	217	1680	1011	196	1584	1755
Arrive On Green	0.18	0.15	0.15	0.16	0.13	0.13	0.06	0.47	0.47	0.04	0.45	0.45
Sat Flow, veh/h	3401	1841	1560	1753	1841	1560	3456	3554	1585	1781	3554	2790
Grp Volume(v), veh/h	551	102	281	303	159	47	186	1164	309	89	1524	596
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1753	1841	1560	1728	1777	1585	1781	1777	1395
Q Serve(g_s), s	23.7	7.5	23.0	21.9	12.3	3.8	8.0	38.5	13.2	4.1	62.4	15.1
Cycle Q Clear(g_c), s	23.7	7.5	23.0	21.9	12.3	3.8	8.0	38.5	13.2	4.1	62.4	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	623	282	337	439	248	272	217	1680	1011	196	1584	1755
V/C Ratio(X)	0.88	0.36	0.83	0.69	0.64	0.17	0.86	0.69	0.31	0.45	0.96	0.34
Avail Cap(c_a), veh/h	907	282	337	611	275	295	217	1680	1011	232	1584	1755
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	0.78	0.78	0.78	0.67	0.67	0.67
Uniform Delay (d), s/veh	59.7	56.9	56.2	44.5	61.4	52.7	69.6	31.0	12.2	26.2	40.3	13.1
Incr Delay (d2), s/veh	7.4	0.8	16.3	1.9	4.3	0.3	22.7	1.9	0.6	1.1	11.5	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(95%),veh/ln	16.3	6.4	17.3	15.0	10.1	2.8	7.2	22.9	8.0	3.2	36.8	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.1	57.7	72.5	46.5	65.7	53.0	92.3	32.9	12.8	27.3	51.9	13.5
LnGrp LOS	E	E	E	D	E	D	F	C	B	C	D	B
Approach Vol, veh/h		934			509			1659			2209	
Approach Delay, s/veh		67.7			53.1			35.8			40.5	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	73.7	33.5	26.8	12.0	77.7	30.7	29.6
Change Period (Y+Rc), s	6.6	6.8	6.0	6.6	6.0	6.8	6.0	6.6
Max Green Setting (Gmax), s	9.4	52.2	40.0	22.4	9.0	53.2	39.4	23.0
Max Q Clear Time (g_c+I1), s	10.0	64.4	25.7	14.3	6.1	40.5	23.9	25.0
Green Ext Time (p_c), s	0.0	0.0	1.8	0.6	0.0	7.5	0.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Future Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	103	178	41	27	11	115	1472	39	14	1765	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	233	245	207	55	36	80	165	2442	65	210	2125	87
Arrive On Green	0.13	0.13	0.13	0.02	0.02	0.02	0.04	0.69	0.69	0.61	0.61	0.61
Sat Flow, veh/h	1753	1841	1560	1077	709	1560	1781	3537	94	346	3478	143
Grp Volume(v), veh/h	86	103	178	68	0	11	115	739	772	14	897	941
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1787	0	1560	1781	1777	1854	346	1777	1845
Q Serve(g_s), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	3.4	59.5	60.8
Cycle Q Clear(g_c), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	24.6	59.5	60.8
Prop In Lane	1.00		1.00	0.60		1.00	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	233	245	207	92	0	80	165	1227	1280	210	1086	1127
V/C Ratio(X)	0.37	0.42	0.86	0.74	0.00	0.14	0.70	0.60	0.60	0.07	0.83	0.84
Avail Cap(c_a), veh/h	374	393	333	381	0	333	190	1227	1280	210	1086	1127
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	1.00	0.00	1.00	1.00	1.00	1.00	0.27	0.27	0.27
Uniform Delay (d), s/veh	59.3	59.7	63.7	72.7	0.0	70.4	31.5	12.3	12.3	22.0	22.9	23.2
Incr Delay (d2), s/veh	1.0	1.2	12.0	11.0	0.0	0.8	8.9	2.2	2.1	0.2	2.1	2.1
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(95%),veh/ln	5.5	6.7	11.8	5.3	0.0	0.8	5.5	19.4	20.2	0.5	29.0	30.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	60.9	75.7	83.7	0.0	71.2	40.4	14.5	14.4	22.2	25.0	25.3
LnGrp LOS	E	E	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		367			79			1626			1852	
Approach Delay, s/veh		67.9			82.0			16.3			25.1	
Approach LOS		E			F			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.9	98.4		13.7		110.4		25.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	5.5	62.8		7.7		35.2		18.8				
Green Ext Time (p_c), s	0.0	0.0		0.3		14.4		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			26.6									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	287	1701	54	67	1775
Future Volume (veh/h)	302	287	1701	54	67	1775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	302	1791	57	71	1868
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	667	355	2261	72	172	2540
Arrive On Green	0.20	0.20	0.64	0.64	0.03	0.71
Sat Flow, veh/h	3401	1560	3609	111	1781	3647
Grp Volume(v), veh/h	318	302	901	947	71	1868
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1850	1781	1777
Q Serve(g_s), s	12.4	27.8	55.1	56.1	1.9	47.4
Cycle Q Clear(g_c), s	12.4	27.8	55.1	56.1	1.9	47.4
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	667	355	1143	1190	172	2540
V/C Ratio(X)	0.48	0.85	0.79	0.80	0.41	0.74
Avail Cap(c_a), veh/h	667	355	1143	1190	341	2540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.60	0.60	1.00	1.00
Uniform Delay (d), s/veh	53.5	55.5	19.4	19.6	23.3	12.9
Incr Delay (d2), s/veh	0.5	17.5	3.4	3.4	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	32.1	29.1	30.6	2.5	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	73.0	22.8	23.0	24.9	14.8
LnGrp LOS	D	E	C	C	C	B
Approach Vol, veh/h	620		1848			1939
Approach Delay, s/veh	63.3		22.9			15.2
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.0		36.0	10.7	103.3
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		49.4		29.8	3.9	58.1
Green Ext Time (p_c), s		28.3		0.0	0.1	16.2

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

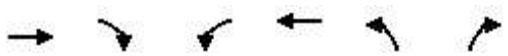
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Future Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	621	0	341	467	6	244	0	257	0	0	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	866		420	1151	15	275	0	0	0	0	103
Arrive On Green	0.00	0.47	0.00	0.12	0.63	0.63	0.16	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1813	23	1753	244		0	0	1560
Grp Volume(v), veh/h	0	621	0	341	0	473	244	64.3		0	0	51
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Cycle Q Clear(g_c), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	866		420	0	1165	275			0	0	103
V/C Ratio(X)	0.00	0.72		0.81	0.00	0.41	0.89			0.00	0.00	0.50
Avail Cap(c_a), veh/h	0	866		494	0	1165	445			0	0	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.7	0.0	21.4	0.0	11.3	52.1			0.0	0.0	56.8
Incr Delay (d2), s/veh	0.0	5.1	0.0	8.6	0.0	1.1	12.2			0.0	0.0	3.6
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
%ile BackOfQ(95%),veh/ln	0.0	22.4	0.0	9.6	0.0	10.9	13.3			0.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.7	0.0	30.0	0.0	12.4	64.3			0.0	0.0	60.5
LnGrp LOS	A	C		C	A	B	E			A	A	E
Approach Vol, veh/h		621	A		814						51	
Approach Delay, s/veh		31.7			19.8						60.5	
Approach LOS		C			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	25.8	14.3	20.7	65.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		18.0	19.2	6.0	14.1	36.0						
Green Ext Time (p_c), s		3.5	0.6	0.1	0.6	4.0						

Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	55	66	759	44	54
Future Volume (veh/h)	766	55	66	759	44	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	806	58	69	799	46	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	968	820	323	1260	180	160
Arrive On Green	0.53	0.53	0.06	0.68	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	806	58	69	799	46	57
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	21.6	1.1	0.9	14.1	1.4	2.0
Cycle Q Clear(g_c), s	21.6	1.1	0.9	14.1	1.4	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	968	820	323	1260	180	160
V/C Ratio(X)	0.83	0.07	0.21	0.63	0.26	0.36
Avail Cap(c_a), veh/h	1660	1407	435	2070	361	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	6.8	9.8	5.1	24.1	24.4
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.5	0.6	6.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	6.9	10.1	5.7	24.8	25.7
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	864			868	103	
Approach Delay, s/veh	13.2			6.0	25.3	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.3		12.0	9.3	37.1
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		16.1		4.0	2.9	23.6
Green Ext Time (p_c), s		7.4		0.1	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

APPENDIX K

(Build Alternative 2 Intersection LOS Results)

2025 Build Alternative 2 Intersection LOS Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↑↑	↱
Traffic Volume (veh/h)	0	540	78	196	195	0	0	0	0	26	1031	350
Future Volume (veh/h)	0	540	78	196	195	0	0	0	0	26	1031	350
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	0				1870	1870	1870
Adj Flow Rate, veh/h	0	568	82	206	205	0				27	1085	368
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	796	247	301	1132	0				1027	2048	914
Arrive On Green	0.00	0.16	0.16	0.19	0.54	0.00				0.58	0.58	0.58
Sat Flow, veh/h	0	5191	1560	1753	3589	0				1781	3554	1585
Grp Volume(v), veh/h	0	568	82	206	205	0				27	1085	368
Grp Sat Flow(s),veh/h/ln	0	1675	1560	1753	1749	0				1781	1777	1585
Q Serve(g_s), s	0.0	12.9	5.6	11.4	3.6	0.0				0.8	22.3	15.4
Cycle Q Clear(g_c), s	0.0	12.9	5.6	11.4	3.6	0.0				0.8	22.3	15.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	796	247	301	1132	0				1027	2048	914
V/C Ratio(X)	0.00	0.71	0.33	0.68	0.18	0.00				0.03	0.53	0.40
Avail Cap(c_a), veh/h	0	1466	455	494	1982	0				1027	2048	914
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.82	0.82	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	47.9	44.9	32.4	19.5	0.0				10.9	15.5	14.0
Incr Delay (d2), s/veh	0.0	1.2	0.8	2.3	0.1	0.0				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
%ile BackOfQ(50%),veh/ln	0.0	5.5	2.2	4.6	1.4	0.0				0.3	8.9	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	49.1	45.6	34.6	19.5	0.0				10.9	15.8	14.3
LnGrp LOS	A	D	D	C	B	A				B	B	B
Approach Vol, veh/h		650			411						1480	
Approach Delay, s/veh		48.7			27.1						15.3	
Approach LOS		D			C						B	

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		75.2		44.8			19.8	25.0				
Change Period (Y+Rc), s		6.0		6.0			6.0	6.0				
Max Green Setting (Gmax), s		40.0		68.0			27.0	35.0				
Max Q Clear Time (g_c+I1), s		24.3		5.6			13.4	14.9				
Green Ext Time (p_c), s		8.3		1.5			0.5	4.1				

Intersection Summary												
HCM 6th Ctrl Delay			25.8									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Future Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	122	56	12	28	21	84	1069	15	16	1192	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	148	155	132	20	47	57	335	2703	38	386	2360	97
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	0.03	0.75	0.75	0.68	0.68	0.68
Sat Flow, veh/h	1753	1841	1560	544	1269	1560	1781	3588	50	520	3479	143
Grp Volume(v), veh/h	98	122	56	40	0	21	84	529	555	16	609	632
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1814	0	1560	1781	1777	1861	520	1777	1845
Q Serve(g_s), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	1.7	25.1	25.2
Cycle Q Clear(g_c), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	6.1	25.1	25.2
Prop In Lane	1.00		1.00	0.30		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	148	155	132	67	0	57	335	1339	1402	386	1206	1252
V/C Ratio(X)	0.66	0.79	0.43	0.60	0.00	0.37	0.25	0.40	0.40	0.04	0.50	0.51
Avail Cap(c_a), veh/h	292	307	260	375	0	322	367	1339	1402	386	1206	1252
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.6	67.3	65.2	71.1	0.0	70.5	9.0	6.5	6.5	9.5	11.8	11.8
Incr Delay (d2), s/veh	5.0	8.5	2.2	8.3	0.0	3.8	0.4	0.9	0.8	0.2	1.5	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	3.9	5.0	2.1	1.7	0.0	0.9	0.8	5.9	6.1	0.2	10.2	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	75.8	67.4	79.4	0.0	74.4	9.4	7.4	7.3	9.7	13.3	13.3
LnGrp LOS	E	E	E	E	A	E	A	A	A	A	B	B
Approach Vol, veh/h		276			61			1168			1257	
Approach Delay, s/veh		72.6			77.7			7.5			13.2	
Approach LOS		E			E			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	108.6		11.5		119.8		18.6				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	4.0	27.2		5.3		17.7		11.7				
Green Ext Time (p_c), s	0.0	11.1		0.2		9.5		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		18.2	
HCM 6th LOS		B	

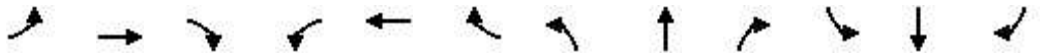
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	78	1153	211	217	1289
Future Volume (veh/h)	74	78	1153	211	217	1289
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	82	1214	222	228	1357
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	220	169	2289	416	349	3007
Arrive On Green	0.06	0.06	0.76	0.76	0.04	0.85
Sat Flow, veh/h	3401	1560	3097	545	1781	3647
Grp Volume(v), veh/h	78	82	715	721	228	1357
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1772	1781	1777
Q Serve(g_s), s	3.3	7.4	24.0	24.5	4.0	14.3
Cycle Q Clear(g_c), s	3.3	7.4	24.0	24.5	4.0	14.3
Prop In Lane	1.00	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	220	169	1354	1351	349	3007
V/C Ratio(X)	0.36	0.48	0.53	0.53	0.65	0.45
Avail Cap(c_a), veh/h	395	249	1354	1351	580	3007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.2	62.9	7.1	7.2	8.8	2.9
Incr Delay (d2), s/veh	1.0	2.1	1.5	1.5	2.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	6.6	9.0	9.1	2.8	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	65.1	8.6	8.7	10.9	3.4
LnGrp LOS	E	E	A	A	B	A
Approach Vol, veh/h	160		1436			1585
Approach Delay, s/veh	66.6		8.6			4.5
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.7		16.3	12.6	121.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		16.3		9.4	6.0	26.5
Green Ext Time (p_c), s		16.5		0.3	0.6	16.2

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Future Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	356	0	146	339	1	204	0	222	0	0	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	858		550	1119	3	248	0	0	0	0	13
Arrive On Green	0.00	0.47	0.00	0.06	0.61	0.61	0.14	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	0	1841	0	1753	1834	5	1753	204		0	0	1560
Grp Volume(v), veh/h	0	356	0	146	0	340	204	39.5		0	0	3
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1840	1753	D		0	0	1560
Q Serve(g_s), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	858		550	0	1123	248			0	0	13
V/C Ratio(X)	0.00	0.42		0.27	0.00	0.30	0.82			0.00	0.00	0.24
Avail Cap(c_a), veh/h	0	858		577	0	1123	382			0	0	208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.2	0.0	9.1	0.0	7.0	31.2			0.0	0.0	36.9
Incr Delay (d2), s/veh	0.0	1.5	0.0	0.3	0.0	0.7	8.3			0.0	0.0	9.4
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
%ile BackOfQ(50%),veh/ln	0.0	4.0	0.0	1.0	0.0	2.4	4.0			0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.7	0.0	9.3	0.0	7.7	39.5			0.0	0.0	46.3
LnGrp LOS	A	B		A	A	A	D			A	A	D
Approach Vol, veh/h		356	A		486						3	
Approach Delay, s/veh		14.7			8.2						46.3	
Approach LOS		B			A						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		51.7	16.6	6.6	10.8	40.9						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		45.7	16.3	10.0	6.0	33.7						
Max Q Clear Time (g_c+I1), s		8.6	10.5	2.1	5.0	11.6						
Green Ext Time (p_c), s		2.2	0.3	0.0	0.0	2.1						

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	44	90	458	11	16
Future Volume (veh/h)	526	44	90	458	11	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	554	46	95	482	12	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	769	652	416	1133	220	195
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	554	46	95	482	12	17
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.0	0.8	1.3	6.5	0.3	0.5
Cycle Q Clear(g_c), s	12.0	0.8	1.3	6.5	0.3	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	652	416	1133	220	195
V/C Ratio(X)	0.72	0.07	0.23	0.43	0.05	0.09
Avail Cap(c_a), veh/h	2253	1909	545	2752	220	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	8.4	7.8	4.8	18.4	18.5
Incr Delay (d2), s/veh	1.3	0.0	0.3	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.2	0.4	1.5	0.1	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	8.4	8.1	5.0	18.5	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	600			577	29	
Approach Delay, s/veh	12.6			5.5	18.6	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.9		12.0	9.5	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		8.5		2.5	3.3	14.0
Green Ext Time (p_c), s		3.5		0.0	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	475	91	0	0	251	11	140	956	195	0	0
Future Volume (veh/h)	475	91	0	0	251	11	140	956	195	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No			No			No			
Adj Sat Flow, veh/h/ln	1841	1841	0	0	1841	1841	1841	1841	1841		
Adj Flow Rate, veh/h	500	96	0	0	264	12	147	147	205		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	4	4	0	0	4	4	4	4	4		
Cap, veh/h	568	687	0	0	311	263	967	967	860		
Arrive On Green	0.28	0.62	0.00	0.00	0.17	0.17	0.55	0.55	0.55		
Sat Flow, veh/h	3401	1841	0	0	1841	1560	1753	1753	1560		
Grp Volume(v), veh/h	500	96	0	0	264	12	147	147	205		
Grp Sat Flow(s),veh/h/ln	1700	1841	0	0	1841	1560	1753	1753	1560		
Q Serve(g_s), s	16.9	2.6	0.0	0.0	16.7	0.8	4.9	4.9	8.1		
Cycle Q Clear(g_c), s	16.9	2.6	0.0	0.0	16.7	0.8	4.9	4.9	8.1		
Prop In Lane	1.00		0.00	0.00		1.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	568	687	0	0	311	263	967	967	860		
V/C Ratio(X)	0.88	0.14	0.00	0.00	0.85	0.05	0.15	0.15	0.24		
Avail Cap(c_a), veh/h	751	1112	0	0	637	539	967	967	860		
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	42.1	14.6	0.0	0.0	48.4	41.8	13.2	13.2	13.9		
Incr Delay (d2), s/veh	7.0	0.1	0.0	0.0	6.5	0.1	0.1	0.1	0.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.9	1.1	0.0	0.0	8.2	0.3	2.0	2.0	2.9		
Unsig. Movement Delay, s/veh											
LnGrp Delay(d),s/veh	49.1	14.7	0.0	0.0	54.9	41.9	13.2	13.2	14.0		
LnGrp LOS	D	B	A	A	D	D	B	B	B		
Approach Vol, veh/h		596			276		1358	1358			
Approach Delay, s/veh		43.6			54.3		16.2	16.2			
Approach LOS		D			D		B	B			

Timer - Assigned Phs			3	4		6		8			
Phs Duration (G+Y+Rc), s			24.6	24.7		70.7		49.3			
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s			26.5	41.5		38.5		72.5			
Max Q Clear Time (g_c+I1), s			18.9	18.7		23.1		4.6			
Green Ext Time (p_c), s			1.2	1.5		4.8		0.6			

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↑↑	↱
Traffic Volume (veh/h)	0	465	204	200	233	0	0	0	0	35	1054	367
Future Volume (veh/h)	0	465	204	200	233	0	0	0	0	35	1054	367
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	0				1870	1870	1870
Adj Flow Rate, veh/h	0	489	215	211	245	0				37	1109	386
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	896	278	326	1198	0				993	1981	884
Arrive On Green	0.00	0.18	0.18	0.23	0.68	0.00				0.56	0.56	0.56
Sat Flow, veh/h	0	5191	1560	1753	3589	0				1781	3554	1585
Grp Volume(v), veh/h	0	489	215	211	245	0				37	1109	386
Grp Sat Flow(s),veh/h/ln	0	1675	1560	1753	1749	0				1781	1777	1585
Q Serve(g_s), s	0.0	10.6	15.8	11.5	3.1	0.0				1.1	24.1	17.1
Cycle Q Clear(g_c), s	0.0	10.6	15.8	11.5	3.1	0.0				1.1	24.1	17.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	896	278	326	1198	0				993	1981	884
V/C Ratio(X)	0.00	0.55	0.77	0.65	0.20	0.00				0.04	0.56	0.44
Avail Cap(c_a), veh/h	0	1382	429	389	1661	0				993	1981	884
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.77	0.77	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	44.9	47.0	29.2	12.9	0.0				12.0	17.1	15.5
Incr Delay (d2), s/veh	0.0	0.5	4.6	2.2	0.1	0.0				0.0	0.4	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
%ile BackOfQ(50%),veh/ln	0.0	4.5	6.5	4.3	1.2	0.0				0.5	9.6	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.4	51.6	31.4	13.0	0.0				12.0	17.4	15.9
LnGrp LOS	A	D	D	C	B	A				B	B	B
Approach Vol, veh/h		704			456						1532	
Approach Delay, s/veh		47.3			21.5						16.9	
Approach LOS		D			C						B	

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		72.9		47.1			19.7	27.4				
Change Period (Y+Rc), s		6.0		6.0			6.0	6.0				
Max Green Setting (Gmax), s		51.0		57.0			18.0	33.0				
Max Q Clear Time (g_c+I1), s		26.1		5.1			13.5	17.8				
Green Ext Time (p_c), s		11.1		1.8			0.2	3.6				

Intersection Summary												
HCM 6th Ctrl Delay			25.6									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Future Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	95	131	29	25	8	83	993	26	12	1462	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	180	189	160	40	34	65	242	2585	68	394	2267	105
Arrive On Green	0.10	0.10	0.10	0.04	0.04	0.04	0.03	0.73	0.73	0.66	0.66	0.66
Sat Flow, veh/h	1753	1841	1560	963	830	1560	1781	3538	93	553	3458	160
Grp Volume(v), veh/h	79	95	131	54	0	8	83	499	520	12	749	781
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1793	0	1560	1781	1777	1854	553	1777	1841
Q Serve(g_s), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	1.2	37.7	38.0
Cycle Q Clear(g_c), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	5.8	37.7	38.0
Prop In Lane	1.00		1.00	0.54		1.00	1.00		0.05	1.00		0.09
Lane Grp Cap(c), veh/h	180	189	160	74	0	65	242	1298	1354	394	1165	1207
V/C Ratio(X)	0.44	0.50	0.82	0.73	0.00	0.12	0.34	0.38	0.38	0.03	0.64	0.65
Avail Cap(c_a), veh/h	374	393	333	382	0	333	275	1298	1354	394	1165	1207
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.2	63.7	65.9	71.1	0.0	69.3	14.1	7.6	7.6	10.8	15.4	15.4
Incr Delay (d2), s/veh	1.7	2.1	9.7	12.7	0.0	0.9	0.8	0.9	0.8	0.1	2.7	2.7
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	2.9	3.6	5.4	2.3	0.0	0.3	1.0	6.1	6.4	0.2	15.7	16.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	65.7	75.7	83.8	0.0	70.1	14.9	8.4	8.4	10.9	18.1	18.1
LnGrp LOS	E	E	E	F	A	E	B	A	A	B	B	B
Approach Vol, veh/h		305			62			1102			1542	
Approach Delay, s/veh		69.8			82.0			8.9			18.1	
Approach LOS		E			F			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	105.1		12.2		116.4		21.4				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	4.2	40.0		6.5		17.8		14.3				
Green Ext Time (p_c), s	0.0	8.6		0.2		8.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			21.3									
HCM 6th LOS			C									

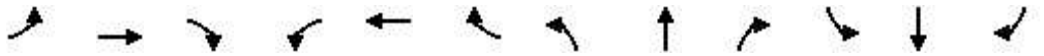
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	217	1160	43	54	1231
Future Volume (veh/h)	215	217	1160	43	54	1231
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	226	228	1221	45	57	1296
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	539	294	2384	88	326	2673
Arrive On Green	0.16	0.16	0.68	0.68	0.03	0.75
Sat Flow, veh/h	3401	1560	3589	129	1781	3647
Grp Volume(v), veh/h	226	228	620	646	57	1296
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1847	1781	1777
Q Serve(g_s), s	9.0	20.8	25.6	25.6	1.4	21.3
Cycle Q Clear(g_c), s	9.0	20.8	25.6	25.6	1.4	21.3
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	539	294	1212	1260	326	2673
V/C Ratio(X)	0.42	0.77	0.51	0.51	0.18	0.48
Avail Cap(c_a), veh/h	667	353	1212	1260	497	2673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	57.8	11.7	11.7	8.8	7.2
Incr Delay (d2), s/veh	0.5	8.6	1.5	1.5	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	17.9	10.4	10.8	0.5	7.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.4	66.4	13.2	13.2	9.0	7.9
LnGrp LOS	E	E	B	B	A	A
Approach Vol, veh/h	454		1266			1353
Approach Delay, s/veh	61.9		13.2			7.9
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		119.6		30.4	10.5	109.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		23.3		22.8	3.4	27.6
Green Ext Time (p_c), s		15.0		0.9	0.1	12.3

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B



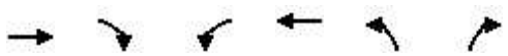
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Future Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	452	0	241	317	4	202	0	181	0	0	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	975		548	1196	15	234	0	0	0	0	92
Arrive On Green	0.00	0.53	0.00	0.08	0.66	0.66	0.13	0.00	0.00	0.00	0.00	0.06
Sat Flow, veh/h	0	1841	0	1753	1814	23	1753	202		0	0	1560
Grp Volume(v), veh/h	0	452	0	241	0	321	202	60.7		0	0	37
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	975		548	0	1211	234			0	0	92
V/C Ratio(X)	0.00	0.46		0.44	0.00	0.26	0.86			0.00	0.00	0.40
Avail Cap(c_a), veh/h	0	975		697	0	1211	463			0	0	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	0.0	12.2	0.0	8.5	51.5			0.0	0.0	55.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.6	0.0	0.5	9.2			0.0	0.0	2.8
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
%ile BackOfQ(50%),veh/ln	0.0	8.2	0.0	2.8	0.0	3.5	6.6			0.0	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.3	0.0	12.7	0.0	9.1	60.7			0.0	0.0	57.9
LnGrp LOS	A	B		B	A	A	E			A	A	E
Approach Vol, veh/h		452	A		562						37	
Approach Delay, s/veh		19.3			10.6						57.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	22.2	13.1	15.7	70.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		10.7	15.7	4.8	9.2	20.6						
Green Ext Time (p_c), s		2.2	0.5	0.0	0.5	3.1						

Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	570	40	46	508	32	40
Future Volume (veh/h)	570	40	46	508	32	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	600	42	48	535	34	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	669	360	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.61	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	600	42	48	535	34	42
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.9	0.7	0.6	7.5	0.8	1.1
Cycle Q Clear(g_c), s	12.9	0.7	0.6	7.5	0.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	669	360	1114	226	201
V/C Ratio(X)	0.76	0.06	0.13	0.48	0.15	0.21
Avail Cap(c_a), veh/h	2077	1760	540	2590	451	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	7.8	8.0	5.1	18.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.2	0.2	1.8	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	7.8	8.2	5.4	18.3	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	642			583	76	
Approach Delay, s/veh	12.5			5.7	18.5	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		9.5		3.1	2.6	14.9
Green Ext Time (p_c), s		4.1		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	395	105	0	0	306	20	127	745	219	0	0
Future Volume (veh/h)	395	105	0	0	306	20	127	745	219	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No			No			No			
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	416	111	0	0	322	21	134	134	231		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2		
Cap, veh/h	487	706	0	0	373	316	975	975	868		
Arrive On Green	0.24	0.63	0.00	0.00	0.20	0.20	0.55	0.55	0.55		
Sat Flow, veh/h	3456	1870	0	0	1870	1585	1781	1781	1585		
Grp Volume(v), veh/h	416	111	0	0	322	21	134	134	231		
Grp Sat Flow(s),veh/h/ln	1728	1870	0	0	1870	1585	1781	1781	1585		
Q Serve(g_s), s	13.8	2.9	0.0	0.0	20.0	1.3	4.4	4.4	9.3		
Cycle Q Clear(g_c), s	13.8	2.9	0.0	0.0	20.0	1.3	4.4	4.4	9.3		
Prop In Lane	1.00		0.00	0.00		1.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	487	706	0	0	373	316	975	975	868		
V/C Ratio(X)	0.85	0.16	0.00	0.00	0.86	0.07	0.14	0.14	0.27		
Avail Cap(c_a), veh/h	734	1130	0	0	662	561	975	975	868		
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.79	0.79	0.00	0.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	44.7	14.3	0.0	0.0	46.5	39.0	13.3	13.3	14.4		
Incr Delay (d2), s/veh	5.1	0.1	0.0	0.0	6.0	0.1	0.1	0.1	0.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	1.2	0.0	0.0	9.9	0.5	1.8	1.8	3.3		
Unsig. Movement Delay, s/veh											
LnGrp Delay(d),s/veh	49.8	14.4	0.0	0.0	52.5	39.1	13.4	13.4	14.6		
LnGrp LOS	D	B	A	A	D	D	B	B	B		
Approach Vol, veh/h		527			343		1149	1149			
Approach Delay, s/veh		42.3			51.7		15.3	15.3			
Approach LOS		D			D		B	B			

Timer - Assigned Phs			3	4		6		8			
Phs Duration (G+Y+Rc), s			21.4	28.4		70.2		49.8			
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s			25.5	42.5		38.5		72.5			
Max Q Clear Time (g_c+I1), s			15.8	22.0		17.0		4.9			
Green Ext Time (p_c), s			1.1	1.9		4.3		0.7			

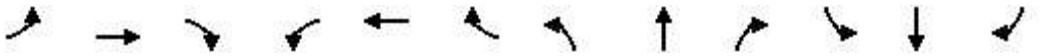
Intersection Summary	
HCM 6th Ctrl Delay	28.5
HCM 6th LOS	C

2045 Build Alternative 2 Intersection LOS Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	783	128	281	271	0	0	0	0	66	1482	516
Future Volume (veh/h)	0	783	128	281	271	0	0	0	0	66	1482	516
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	0				1870	1870	1870
Adj Flow Rate, veh/h	0	824	135	296	285	0				69	1560	543
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	1098	341	354	1455	0				862	1720	767
Arrive On Green	0.00	0.14	0.14	0.15	0.42	0.00				0.48	0.48	0.48
Sat Flow, veh/h	0	5191	1560	1753	3589	0				1781	3554	1585
Grp Volume(v), veh/h	0	824	135	296	285	0				69	1560	543
Grp Sat Flow(s),veh/h/ln	0	1675	1560	1753	1749	0				1781	1777	1585
Q Serve(g_s), s	0.0	18.9	9.4	15.1	6.2	0.0				2.5	48.4	32.3
Cycle Q Clear(g_c), s	0.0	18.9	9.4	15.1	6.2	0.0				2.5	48.4	32.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1098	341	354	1455	0				862	1720	767
V/C Ratio(X)	0.00	0.75	0.40	0.84	0.20	0.00				0.08	0.91	0.71
Avail Cap(c_a), veh/h	0	1466	455	490	1982	0				862	1720	767
HCM Platoon Ratio	1.00	0.66	0.66	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.74	0.74	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	48.2	44.2	30.4	22.3	0.0				16.6	28.5	24.3
Incr Delay (d2), s/veh	0.0	1.5	0.7	6.7	0.0	0.0				0.0	7.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	13.1	6.9	10.7	4.6	0.0				1.8	28.2	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	49.7	44.9	37.1	22.3	0.0				16.7	35.9	27.3
LnGrp LOS	A	D	D	D	C	A				B	D	C
Approach Vol, veh/h		959			581						2172	
Approach Delay, s/veh		49.1			29.9						33.1	
Approach LOS		D			C						C	

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		64.1		55.9			23.7	32.2				
Change Period (Y+Rc), s		6.0		6.0			6.0	6.0				
Max Green Setting (Gmax), s		40.0		68.0			27.0	35.0				
Max Q Clear Time (g_c+I1), s		50.4		8.2			17.1	20.9				
Green Ext Time (p_c), s		0.0		2.1			0.6	5.3				

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Future Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	0	93	21	35	33	121	1597	23	22	1764	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	324	0	144	30	51	70	187	2644	38	212	2293	96
Arrive On Green	0.06	0.00	0.06	0.04	0.04	0.04	0.03	0.74	0.74	0.66	0.66	0.66
Sat Flow, veh/h	3506	0	1560	678	1129	1560	1781	3586	52	312	3476	145
Grp Volume(v), veh/h	258	0	93	56	0	33	121	790	830	22	897	941
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1807	0	1560	1781	1777	1861	312	1777	1844
Q Serve(g_s), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	5.4	52.0	53.2
Cycle Q Clear(g_c), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	25.5	52.0	53.2
Prop In Lane	1.00		1.00	0.37		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	324	0	144	81	0	70	187	1310	1372	212	1172	1217
V/C Ratio(X)	0.80	0.00	0.65	0.69	0.00	0.47	0.65	0.60	0.60	0.10	0.76	0.77
Avail Cap(c_a), veh/h	584	0	260	373	0	322	215	1310	1372	212	1172	1217
HCM Platoon Ratio	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.0	0.0	68.0	70.6	0.0	69.9	26.3	9.3	9.3	18.1	17.5	17.7
Incr Delay (d2), s/veh	4.5	0.0	4.8	9.9	0.0	4.8	5.4	2.1	2.0	1.0	4.8	4.8
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(95%),veh/ln	9.0	0.0	6.8	4.2	0.0	2.4	5.7	18.0	18.7	0.8	29.7	31.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	0.0	72.8	80.5	0.0	74.7	31.6	11.4	11.3	19.1	22.3	22.6
LnGrp LOS	E	A	E	F	A	E	C	B	B	B	C	C
Approach Vol, veh/h		351			89			1741			1860	
Approach Delay, s/veh		73.3			78.3			12.8			22.4	
Approach LOS		E			E			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.6	105.8		12.7		117.4		19.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	5.2	55.2		6.6		33.7		12.9				
Green Ext Time (p_c), s	0.1	5.2		0.3		18.0		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

Notes

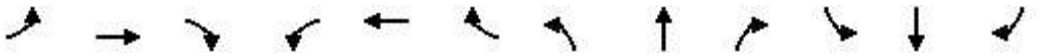
User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	102	1716	279	289	1892
Future Volume (veh/h)	98	102	1716	279	289	1892
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	107	1806	294	304	1992
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	250	338	2010	318	328	2975
Arrive On Green	0.07	0.07	0.65	0.65	0.14	0.84
Sat Flow, veh/h	3401	1560	3166	487	1781	3647
Grp Volume(v), veh/h	103	107	1023	1077	304	1992
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1783	1781	1777
Q Serve(g_s), s	4.3	8.7	70.4	79.2	19.1	31.1
Cycle Q Clear(g_c), s	4.3	8.7	70.4	79.2	19.1	31.1
Prop In Lane	1.00	1.00		0.27	1.00	
Lane Grp Cap(c), veh/h	250	338	1162	1166	328	2975
V/C Ratio(X)	0.41	0.32	0.88	0.92	0.93	0.67
Avail Cap(c_a), veh/h	395	404	1162	1166	381	2975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.4	49.4	21.2	22.7	53.4	4.5
Incr Delay (d2), s/veh	1.1	0.5	9.7	13.4	26.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	12.6	40.1	45.6	19.9	14.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	49.9	30.8	36.1	79.8	5.7
LnGrp LOS	E	D	C	D	E	A
Approach Vol, veh/h	210		2100			2296
Approach Delay, s/veh	58.6		33.5			15.5
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		132.4		17.6	27.5	104.9
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		33.1		10.7	21.1	81.2
Green Ext Time (p_c), s		37.8		0.4	0.4	5.5

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Future Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	527	0	219	499	3	302	0	331	0	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	770		380	1037	6	339	0	0	0	0	24
Arrive On Green	0.00	0.42	0.00	0.07	0.57	0.57	0.19	0.00	0.00	0.00	0.00	0.02
Sat Flow, veh/h	0	1841	0	1753	1828	11	1753	302		0	0	1560
Grp Volume(v), veh/h	0	527	0	219	0	502	302	54.3		0	0	6
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1839	1753	D		0	0	1560
Q Serve(g_s), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	770		380	0	1043	339			0	0	24
V/C Ratio(X)	0.00	0.68		0.58	0.00	0.48	0.89			0.00	0.00	0.25
Avail Cap(c_a), veh/h	0	770		380	0	1043	355			0	0	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.1	0.0	14.3	0.0	10.4	31.6			0.0	0.0	39.2
Incr Delay (d2), s/veh	0.0	4.9	0.0	2.2	0.0	1.6	22.6			0.0	0.0	5.2
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
%ile BackOfQ(95%),veh/ln	0.0	13.3	0.0	3.9	0.0	8.9	12.2			0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.0	0.0	16.5	0.0	12.0	54.3			0.0	0.0	44.3
LnGrp LOS	A	C		B	A	B	D			A	A	D
Approach Vol, veh/h		527	A		721						6	
Approach Delay, s/veh		24.0			13.3						44.3	
Approach LOS		C			B						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		51.7	21.6	7.3	12.0	39.7						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		45.7	16.3	10.0	6.0	33.7						
Max Q Clear Time (g_c+I1), s		15.1	15.5	2.3	7.5	20.8						
Green Ext Time (p_c), s		3.5	0.1	0.0	0.0	2.8						

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	775	70	132	690	17	24
Future Volume (veh/h)	775	70	132	690	17	24
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	74	139	726	18	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	827	343	1289	171	153
Arrive On Green	0.53	0.53	0.07	0.70	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	816	74	139	726	18	25
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	23.0	1.4	1.9	12.0	0.6	0.9
Cycle Q Clear(g_c), s	23.0	1.4	1.9	12.0	0.6	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	827	343	1289	171	153
V/C Ratio(X)	0.84	0.09	0.41	0.56	0.11	0.16
Avail Cap(c_a), veh/h	1758	1489	416	2147	171	153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.1	11.0	4.6	25.2	25.4
Incr Delay (d2), s/veh	2.0	0.0	0.8	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.7	1.4	5.1	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	7.2	11.7	4.9	25.5	25.9
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	890			865	43	
Approach Delay, s/veh	13.6			6.0	25.7	
Approach LOS	B			A	C	

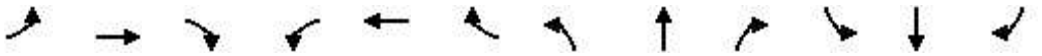
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		12.0	10.4	38.9
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		14.0		2.9	3.9	25.0
Green Ext Time (p_c), s		6.4		0.0	0.1	7.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	702	147	0	0	360	27	192	1397	266	0	0
Future Volume (veh/h)	702	147	0	0	360	27	192	1397	266	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No			No			No			
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	739	155	0	0	379	28	202	202	280		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2		
Cap, veh/h	763	914	0	0	431	365	777	777	692		
Arrive On Green	0.37	0.82	0.00	0.00	0.23	0.23	0.44	0.44	0.44		
Sat Flow, veh/h	3456	1870	0	0	1870	1585	1781	1781	1585		
Grp Volume(v), veh/h	739	155	0	0	379	28	202	202	280		
Grp Sat Flow(s),veh/h/ln	1728	1870	0	0	1870	1585	1781	1781	1585		
Q Serve(g_s), s	25.2	2.1	0.0	0.0	23.5	1.7	8.6	8.6	14.5		
Cycle Q Clear(g_c), s	25.2	2.1	0.0	0.0	23.5	1.7	8.6	8.6	14.5		
Prop In Lane	1.00		0.00	0.00		1.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	763	914	0	0	431	365	777	777	692		
V/C Ratio(X)	0.97	0.17	0.00	0.00	0.88	0.08	0.26	0.26	0.40		
Avail Cap(c_a), veh/h	763	1130	0	0	647	548	777	777	692		
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.71	0.71	0.00	0.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	37.5	5.8	0.0	0.0	44.6	36.2	21.5	21.5	23.1		
Incr Delay (d2), s/veh	20.2	0.1	0.0	0.0	9.2	0.1	0.2	0.2	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		
%ile BackOfQ(95%),veh/ln	16.1	1.5	0.0	0.0	17.6	1.2	6.6	6.6	9.3		
Unsig. Movement Delay, s/veh											
LnGrp Delay(d),s/veh	57.6	5.9	0.0	0.0	53.8	36.3	21.7	21.7	23.5		
LnGrp LOS	E	A	A	A	D	D	C	C	C		
Approach Vol, veh/h		894			407		1953	1953			
Approach Delay, s/veh		48.7			52.6		37.3	37.3			
Approach LOS		D			D		D	D			

Timer - Assigned Phs			3	4		6		8			
Phs Duration (G+Y+Rc), s			31.0	32.1		56.9		63.1			
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s			26.5	41.5		38.5		72.5			
Max Q Clear Time (g_c+I1), s			27.2	25.5		48.1		4.1			
Green Ext Time (p_c), s			0.0	2.1		0.0		1.0			

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰	↑↑	↱
Traffic Volume (veh/h)	0	620	267	288	328	0	0	0	0	85	1448	566
Future Volume (veh/h)	0	620	267	288	328	0	0	0	0	85	1448	566
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	0				1870	1870	1870
Adj Flow Rate, veh/h	0	653	281	303	345	0				89	1524	596
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	0				2	2	2
Cap, veh/h	0	1125	349	376	1467	0				856	1708	762
Arrive On Green	0.00	0.15	0.15	0.15	0.42	0.00				0.48	0.48	0.48
Sat Flow, veh/h	0	5191	1560	1753	3589	0				1781	3554	1585
Grp Volume(v), veh/h	0	653	281	303	345	0				89	1524	596
Grp Sat Flow(s),veh/h/ln	0	1675	1560	1753	1749	0				1781	1777	1585
Q Serve(g_s), s	0.0	14.5	20.9	15.4	7.6	0.0				3.3	46.8	37.6
Cycle Q Clear(g_c), s	0.0	14.5	20.9	15.4	7.6	0.0				3.3	46.8	37.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1125	349	376	1467	0				856	1708	762
V/C Ratio(X)	0.00	0.58	0.80	0.81	0.24	0.00				0.10	0.89	0.78
Avail Cap(c_a), veh/h	0	1382	429	384	1661	0				856	1708	762
HCM Platoon Ratio	1.00	0.66	0.66	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.68	0.68	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	45.9	48.6	29.6	22.4	0.0				17.0	28.3	25.9
Incr Delay (d2), s/veh	0.0	0.5	8.9	8.3	0.1	0.0				0.1	6.4	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	10.5	14.3	11.0	5.6	0.0				2.5	28.3	21.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	46.4	57.5	37.9	22.5	0.0				17.1	34.7	31.2
LnGrp LOS	A	D	E	D	C	A				B	C	C
Approach Vol, veh/h		934			648						2209	
Approach Delay, s/veh		49.7			29.7						33.1	
Approach LOS		D			C						C	

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		63.7		56.3			23.5	32.9				
Change Period (Y+Rc), s		6.0		6.0			6.0	6.0				
Max Green Setting (Gmax), s		51.0		57.0			18.0	33.0				
Max Q Clear Time (g_c+I1), s		48.8		9.6			17.4	22.9				
Green Ext Time (p_c), s		2.0		2.5			0.1	4.0				

Intersection Summary												
HCM 6th Ctrl Delay			36.6									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Future Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	103	178	41	27	11	115	1472	39	14	1765	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	234	246	208	55	36	80	165	2439	65	210	2122	87
Arrive On Green	0.09	0.09	0.09	0.02	0.02	0.02	0.04	0.69	0.69	0.61	0.61	0.61
Sat Flow, veh/h	1753	1841	1560	1077	709	1560	1781	3537	94	346	3478	143
Grp Volume(v), veh/h	86	103	178	68	0	11	115	739	772	14	897	941
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1787	0	1560	1781	1777	1854	346	1777	1845
Q Serve(g_s), s	6.9	7.9	16.9	5.7	0.0	1.0	3.5	33.1	33.3	3.4	59.6	60.9
Cycle Q Clear(g_c), s	6.9	7.9	16.9	5.7	0.0	1.0	3.5	33.1	33.3	24.7	59.6	60.9
Prop In Lane	1.00		1.00	0.60		1.00	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	234	246	208	92	0	80	165	1225	1278	210	1084	1125
V/C Ratio(X)	0.37	0.42	0.85	0.74	0.00	0.14	0.70	0.60	0.60	0.07	0.83	0.84
Avail Cap(c_a), veh/h	374	393	333	381	0	333	190	1225	1278	210	1084	1125
HCM Platoon Ratio	0.66	0.66	0.66	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	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.4	62.9	66.9	72.7	0.0	70.4	31.6	12.4	12.4	22.1	23.0	23.3
Incr Delay (d2), s/veh	1.0	1.1	11.6	11.0	0.0	0.8	9.0	2.2	2.1	0.6	7.3	7.4
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(95%),veh/ln	5.8	7.0	12.1	5.3	0.0	0.8	5.5	19.5	20.2	0.6	34.8	36.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	64.0	78.6	83.7	0.0	71.2	40.6	14.6	14.5	22.7	30.3	30.7
LnGrp LOS	E	E	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		367			79			1626			1852	
Approach Delay, s/veh		70.9			82.0			16.4			30.4	
Approach LOS		E			F			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.9	98.3		13.7		110.2		26.0				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	5.5	62.9		7.7		35.3		18.9				
Green Ext Time (p_c), s	0.0	0.0		0.3		14.3		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			29.4									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	287	1701	54	67	1775
Future Volume (veh/h)	302	287	1701	54	67	1775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	302	1791	57	71	1868
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	667	355	2261	72	172	2540
Arrive On Green	0.20	0.20	0.64	0.64	0.03	0.71
Sat Flow, veh/h	3401	1560	3609	111	1781	3647
Grp Volume(v), veh/h	318	302	901	947	71	1868
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1850	1781	1777
Q Serve(g_s), s	12.4	27.8	55.1	56.1	1.9	47.4
Cycle Q Clear(g_c), s	12.4	27.8	55.1	56.1	1.9	47.4
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	667	355	1143	1190	172	2540
V/C Ratio(X)	0.48	0.85	0.79	0.80	0.41	0.74
Avail Cap(c_a), veh/h	667	355	1143	1190	341	2540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	55.5	19.4	19.6	23.3	12.9
Incr Delay (d2), s/veh	0.5	17.5	5.6	5.6	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	32.1	31.7	33.3	2.5	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	73.0	24.9	25.1	24.9	14.8
LnGrp LOS	D	E	C	C	C	B
Approach Vol, veh/h	620		1848			1939
Approach Delay, s/veh	63.3		25.0			15.2
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.0		36.0	10.7	103.3
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		49.4		29.8	3.9	58.1
Green Ext Time (p_c), s		28.3		0.0	0.1	16.2

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Future Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	621	0	341	467	6	244	0	257	0	0	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	866		420	1151	15	275	0	0	0	0	103
Arrive On Green	0.00	0.47	0.00	0.12	0.63	0.63	0.16	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1813	23	1753	244		0	0	1560
Grp Volume(v), veh/h	0	621	0	341	0	473	244	64.3		0	0	51
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Cycle Q Clear(g_c), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	866		420	0	1165	275			0	0	103
V/C Ratio(X)	0.00	0.72		0.81	0.00	0.41	0.89			0.00	0.00	0.50
Avail Cap(c_a), veh/h	0	866		494	0	1165	445			0	0	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.7	0.0	21.4	0.0	11.3	52.1			0.0	0.0	56.8
Incr Delay (d2), s/veh	0.0	5.1	0.0	8.6	0.0	1.1	12.2			0.0	0.0	3.6
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
%ile BackOfQ(95%),veh/ln	0.0	22.4	0.0	9.6	0.0	10.9	13.3			0.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.7	0.0	30.0	0.0	12.4	64.3			0.0	0.0	60.5
LnGrp LOS	A	C		C	A	B	E			A	A	E
Approach Vol, veh/h		621	A		814						51	
Approach Delay, s/veh		31.7			19.8						60.5	
Approach LOS		C			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	25.8	14.3	20.7	65.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		18.0	19.2	6.0	14.1	36.0						
Green Ext Time (p_c), s		3.5	0.6	0.1	0.6	4.0						

Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	55	66	759	44	54
Future Volume (veh/h)	766	55	66	759	44	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	806	58	69	799	46	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	968	820	323	1260	180	160
Arrive On Green	0.53	0.53	0.06	0.68	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	806	58	69	799	46	57
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	21.6	1.1	0.9	14.1	1.4	2.0
Cycle Q Clear(g_c), s	21.6	1.1	0.9	14.1	1.4	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	968	820	323	1260	180	160
V/C Ratio(X)	0.83	0.07	0.21	0.63	0.26	0.36
Avail Cap(c_a), veh/h	1660	1407	435	2070	361	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	6.8	9.8	5.1	24.1	24.4
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.5	0.6	6.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	6.9	10.1	5.7	24.8	25.7
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	864			868	103	
Approach Delay, s/veh	13.2			6.0	25.3	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.3		12.0	9.3	37.1
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		16.1		4.0	2.9	23.6
Green Ext Time (p_c), s		7.4		0.1	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	523	182	0	0	439	45	177	1106	294	0	0
Future Volume (veh/h)	523	182	0	0	439	45	177	1106	294	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach		No			No			No			
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870		
Adj Flow Rate, veh/h	551	192	0	0	462	47	186	186	309		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2		
Cap, veh/h	624	922	0	0	514	436	770	770	685		
Arrive On Green	0.18	0.49	0.00	0.00	0.27	0.27	0.43	0.43	0.43		
Sat Flow, veh/h	3456	1870	0	0	1870	1585	1781	1781	1585		
Grp Volume(v), veh/h	551	192	0	0	462	47	186	186	309		
Grp Sat Flow(s),veh/h/ln	1728	1870	0	0	1870	1585	1781	1781	1585		
Q Serve(g_s), s	18.7	7.0	0.0	0.0	28.5	2.7	7.9	7.9	16.5		
Cycle Q Clear(g_c), s	18.7	7.0	0.0	0.0	28.5	2.7	7.9	7.9	16.5		
Prop In Lane	1.00		0.00	0.00		1.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	624	922	0	0	514	436	770	770	685		
V/C Ratio(X)	0.88	0.21	0.00	0.00	0.90	0.11	0.24	0.24	0.45		
Avail Cap(c_a), veh/h	734	1130	0	0	662	561	770	770	685		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.81	0.81	0.00	0.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	47.9	17.2	0.0	0.0	41.9	32.5	21.6	21.6	24.0		
Incr Delay (d2), s/veh	9.2	0.1	0.0	0.0	12.8	0.1	0.2	0.2	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		
%ile BackOfQ(95%),veh/ln	13.2	5.4	0.0	0.0	21.2	1.9	6.1	6.1	10.3		
Unsig. Movement Delay, s/veh											
LnGrp Delay(d),s/veh	57.1	17.3	0.0	0.0	54.7	32.6	21.8	21.8	24.5		
LnGrp LOS	E	B	A	A	D	C	C	C	C		
Approach Vol, veh/h		743			509		1659	1659			
Approach Delay, s/veh		46.8			52.7		28.3	28.3			
Approach LOS		D			D		C	C			

Timer - Assigned Phs			3	4		6		8			
Phs Duration (G+Y+Rc), s			26.2	37.5		56.4		63.6			
Change Period (Y+Rc), s			4.5	4.5		4.5		4.5			
Max Green Setting (Gmax), s			25.5	42.5		38.5		72.5			
Max Q Clear Time (g_c+I1), s			20.7	30.5		34.2		9.0			
Green Ext Time (p_c), s			1.0	2.4		2.6		1.2			

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

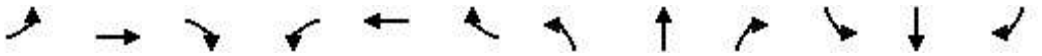
APPENDIX L

(Build Alternative 7 Intersection LOS Results)

2025 Build Alternative 7 Intersection LOS Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	65	0	196	55	11	0	956	195	26	1031	350
Future Volume (vph)	475	65	0	196	55	11	0	956	195	26	1031	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5	6.6	6.6
Lane Util. Factor	0.97	1.00		1.00	0.95			0.95	1.00	1.00	0.95	0.88
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827		1736	3382			3539	1583	1770	3539	2787
Flt Permitted	0.95	1.00		0.71	1.00			1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	3367	1827		1302	3382			3539	1583	289	3539	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	500	68	0	206	58	12	0	1006	205	27	1085	368
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	81	0	0	74
Lane Group Flow (vph)	500	68	0	206	59	0	0	1006	124	27	1085	294
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		pm+pt	NA			NA	pm+ov	pm+pt	NA	pt+ov
Protected Phases	3	8		7	4			6	7	5	1 2	1 2 3
Permitted Phases				4					6	1 2		
Actuated Green, G (s)	37.8	27.0		28.2	8.7			65.3	84.8	74.1	74.1	118.7
Effective Green, g (s)	37.8	27.0		28.2	8.7			65.3	84.8	67.5	74.1	111.9
Actuated g/C Ratio	0.27	0.19		0.20	0.06			0.47	0.61	0.48	0.53	0.80
Clearance Time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		
Lane Grp Cap (vph)	909	352		322	210			1650	958	184	1873	2227
v/s Ratio Prot	c0.15	0.04		0.09	0.02			c0.28	0.02	0.00	c0.31	0.11
v/s Ratio Perm				c0.04					0.06	0.07		
v/c Ratio	0.55	0.19		0.64	0.28			0.61	0.13	0.15	0.58	0.13
Uniform Delay, d1	43.8	47.4		50.7	62.7			27.8	11.8	22.2	22.4	3.2
Progression Factor	0.33	0.40		1.00	1.00			0.96	0.79	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		4.1	0.7			1.6	0.1	0.4	0.4	0.0
Delay (s)	15.2	19.1		54.8	63.4			28.4	9.4	22.6	22.8	3.2
Level of Service	B	B		D	E			C	A	C	C	A
Approach Delay (s)		15.7			57.0			25.1			17.9	
Approach LOS		B			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Future Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	122	56	12	28	21	84	1069	15	16	1192	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	148	155	132	20	47	57	335	2703	38	386	2360	97
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	0.03	0.75	0.75	0.68	0.68	0.68
Sat Flow, veh/h	1753	1841	1560	544	1269	1560	1781	3588	50	520	3479	143
Grp Volume(v), veh/h	98	122	56	40	0	21	84	529	555	16	609	632
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1814	0	1560	1781	1777	1861	520	1777	1845
Q Serve(g_s), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	1.7	25.1	25.2
Cycle Q Clear(g_c), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	6.1	25.1	25.2
Prop In Lane	1.00		1.00	0.30		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	148	155	132	67	0	57	335	1339	1402	386	1206	1252
V/C Ratio(X)	0.66	0.79	0.43	0.60	0.00	0.37	0.25	0.40	0.40	0.04	0.50	0.51
Avail Cap(c_a), veh/h	292	307	260	375	0	322	367	1339	1402	386	1206	1252
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	0.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	66.6	67.3	65.2	71.1	0.0	70.5	9.0	6.5	6.5	9.5	11.8	11.8
Incr Delay (d2), s/veh	5.0	8.5	2.2	8.3	0.0	3.8	0.4	0.9	0.8	0.2	1.3	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(95%),veh/ln	7.0	8.6	3.8	3.0	0.0	1.5	1.4	9.9	10.2	0.4	15.1	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	75.8	67.4	79.4	0.0	74.4	9.4	7.4	7.3	9.7	13.1	13.1
LnGrp LOS	E	E	E	E	A	E	A	A	A	A	B	B
Approach Vol, veh/h		276			61			1168			1257	
Approach Delay, s/veh		72.6			77.7			7.5			13.1	
Approach LOS		E			E			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	108.6		11.5		119.8		18.6				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	4.0	27.2		5.3		17.7		11.7				
Green Ext Time (p_c), s	0.0	11.1		0.2		9.5		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

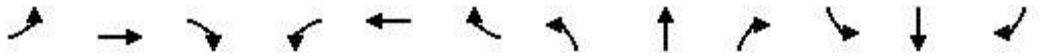
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	78	1153	211	217	1289
Future Volume (veh/h)	74	78	1153	211	217	1289
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	82	1214	222	228	1357
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	220	169	2289	416	349	3007
Arrive On Green	0.06	0.06	0.76	0.76	0.04	0.85
Sat Flow, veh/h	3401	1560	3097	545	1781	3647
Grp Volume(v), veh/h	78	82	715	721	228	1357
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1772	1781	1777
Q Serve(g_s), s	3.3	7.4	24.0	24.5	4.0	14.3
Cycle Q Clear(g_c), s	3.3	7.4	24.0	24.5	4.0	14.3
Prop In Lane	1.00	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	220	169	1354	1351	349	3007
V/C Ratio(X)	0.36	0.48	0.53	0.53	0.65	0.45
Avail Cap(c_a), veh/h	395	249	1354	1351	580	3007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.78	0.78	1.00	1.00
Uniform Delay (d), s/veh	67.2	62.9	7.1	7.2	8.8	2.9
Incr Delay (d2), s/veh	1.0	2.1	1.2	1.2	2.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	10.8	13.1	13.3	5.1	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	65.1	8.2	8.3	10.9	3.4
LnGrp LOS	E	E	A	A	B	A
Approach Vol, veh/h	160		1436			1585
Approach Delay, s/veh	66.6		8.3			4.5
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.7		16.3	12.6	121.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		16.3		9.4	6.0	26.5
Green Ext Time (p_c), s		16.5		0.3	0.6	16.2

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Future Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	356	0	146	339	1	204	0	222	0	0	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	858		550	1119	3	248	0	0	0	0	13
Arrive On Green	0.00	0.47	0.00	0.06	0.61	0.61	0.14	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	0	1841	0	1753	1834	5	1753	204		0	0	1560
Grp Volume(v), veh/h	0	356	0	146	0	340	204	39.5		0	0	3
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1840	1753	D		0	0	1560
Q Serve(g_s), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	858		550	0	1123	248			0	0	13
V/C Ratio(X)	0.00	0.42		0.27	0.00	0.30	0.82			0.00	0.00	0.24
Avail Cap(c_a), veh/h	0	858		577	0	1123	382			0	0	208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.2	0.0	9.1	0.0	7.0	31.2			0.0	0.0	36.9
Incr Delay (d2), s/veh	0.0	1.5	0.0	0.3	0.0	0.7	8.3			0.0	0.0	9.4
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
%ile BackOfQ(95%),veh/ln	0.0	7.2	0.0	1.9	0.0	4.3	7.3			0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.7	0.0	9.3	0.0	7.7	39.5			0.0	0.0	46.3
LnGrp LOS	A	B		A	A	A	D			A	A	D
Approach Vol, veh/h		356	A		486						3	
Approach Delay, s/veh		14.7			8.2						46.3	
Approach LOS		B			A						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		51.7	16.6	6.6	10.8	40.9						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		45.7	16.3	10.0	6.0	33.7						
Max Q Clear Time (g_c+I1), s		8.6	10.5	2.1	5.0	11.6						
Green Ext Time (p_c), s		2.2	0.3	0.0	0.0	2.1						

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	44	90	458	11	16
Future Volume (veh/h)	526	44	90	458	11	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	554	46	95	482	12	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	769	652	416	1133	220	195
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	554	46	95	482	12	17
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.0	0.8	1.3	6.5	0.3	0.5
Cycle Q Clear(g_c), s	12.0	0.8	1.3	6.5	0.3	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	652	416	1133	220	195
V/C Ratio(X)	0.72	0.07	0.23	0.43	0.05	0.09
Avail Cap(c_a), veh/h	2253	1909	545	2752	220	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	8.4	7.8	4.8	18.4	18.5
Incr Delay (d2), s/veh	1.3	0.0	0.3	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	0.4	0.6	2.7	0.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	8.4	8.1	5.0	18.5	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	600			577	29	
Approach Delay, s/veh	12.6			5.5	18.6	
Approach LOS	B			A	B	

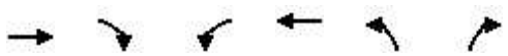
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.9		12.0	9.5	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		8.5		2.5	3.3	14.0
Green Ext Time (p_c), s		3.5		0.0	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	78	140	1151	1227	0
Future Volume (vph)	0	78	140	1151	1227	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	3539	3539	
Flt Permitted		1.00	0.18	1.00	1.00	
Satd. Flow (perm)		1611	335	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	82	147	1212	1292	0
RTOR Reduction (vph)	0	79	0	0	0	0
Lane Group Flow (vph)	0	3	147	1212	1292	0
Turn Type		Perm	pm+pt	NA	NA	
Protected Phases			1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)		5.5	122.5	122.5	109.5	
Effective Green, g (s)		5.5	122.5	122.5	109.5	
Actuated g/C Ratio		0.04	0.88	0.88	0.78	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		63	364	3096	2768	
v/s Ratio Prot			0.02	c0.34	c0.37	
v/s Ratio Perm		c0.00	0.33			
v/c Ratio		0.05	0.40	0.39	0.47	
Uniform Delay, d1		64.7	3.1	1.7	5.2	
Progression Factor		1.00	1.00	1.00	1.59	
Incremental Delay, d2		0.3	0.7	0.4	0.5	
Delay (s)		65.1	3.9	2.0	8.8	
Level of Service		E	A	A	A	
Approach Delay (s)	65.1			2.2	8.8	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

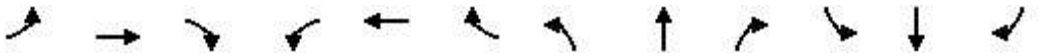
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	540	78	0	405	140	0
Future Volume (vph)	540	78	0	405	140	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.6	
Lane Util. Factor	0.91	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	5085	1583		3539	1770	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	5085	1583		3539	1770	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	568	82	0	426	147	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	568	82	0	426	147	0
Turn Type	NA	Free		NA	pm+pt	
Protected Phases	3 8			3 4 7	1	
Permitted Phases		Free		1 2	6	
Actuated Green, G (s)	52.5	140.0		126.6	74.1	
Effective Green, g (s)	52.5	140.0		120.0	74.1	
Actuated g/C Ratio	0.38	1.00		0.86	0.53	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1906	1583		3033	936	
v/s Ratio Prot	c0.11			0.05	c0.04	
v/s Ratio Perm		0.05		0.07	0.04	
v/c Ratio	0.30	0.05		0.14	0.16	
Uniform Delay, d1	30.8	0.0		1.6	16.9	
Progression Factor	1.00	1.00		1.00	1.01	
Incremental Delay, d2	0.1	0.1		0.0	0.1	
Delay (s)	30.9	0.1		1.6	17.1	
Level of Service	C	A		A	B	
Approach Delay (s)	27.0			1.6	17.1	
Approach LOS	C			A	B	

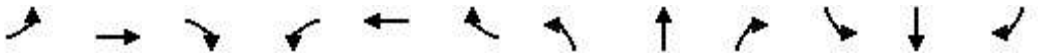
Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	70	0	200	106	20	0	745	219	35	1054	367
Future Volume (vph)	395	70	0	200	106	20	0	745	219	35	1054	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5	6.6	6.6
Lane Util. Factor	0.97	1.00		1.00	0.95			0.95	1.00	1.00	0.95	0.88
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827		1736	3389			3539	1583	1770	3539	2787
Flt Permitted	0.95	1.00		0.71	1.00			1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	3367	1827		1295	3389			3539	1583	463	3539	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	416	74	0	211	112	21	0	784	231	37	1109	386
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	89	0	0	86
Lane Group Flow (vph)	416	74	0	211	121	0	0	784	142	37	1109	300
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		pm+pt	NA			NA	pm+ov	pm+pt	NA	pt+ov
Protected Phases	3	8		7	4			6	7	5	1 2	1 2 3
Permitted Phases				4					6	1 2		
Actuated Green, G (s)	31.6	24.2		30.8	11.7			67.0	86.1	77.3	77.3	115.7
Effective Green, g (s)	31.6	24.2		30.8	11.7			67.0	86.1	70.7	77.3	108.9
Actuated g/C Ratio	0.23	0.17		0.22	0.08			0.48	0.61	0.51	0.55	0.78
Clearance Time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		
Lane Grp Cap (vph)	759	315		345	283			1693	973	287	1954	2167
v/s Ratio Prot	c0.12	0.04		0.08	0.04			0.22	0.02	0.01	c0.31	0.11
v/s Ratio Perm				c0.05					0.07	0.06		
v/c Ratio	0.55	0.23		0.61	0.43			0.46	0.15	0.13	0.57	0.14
Uniform Delay, d1	47.9	49.9		48.5	61.0			24.5	11.4	18.9	20.4	3.9
Progression Factor	0.36	0.38		1.00	1.00			0.94	0.90	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.4		3.2	1.0			0.9	0.1	0.2	0.4	0.0
Delay (s)	18.0	19.4		51.7	62.0			23.9	10.3	19.1	20.8	3.9
Level of Service	B	B		D	E			C	B	B	C	A
Approach Delay (s)		18.2			55.7			20.8			16.5	
Approach LOS		B			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Future Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	95	131	29	25	8	83	993	26	12	1462	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	180	189	160	40	34	65	242	2585	68	394	2267	105
Arrive On Green	0.10	0.10	0.10	0.04	0.04	0.04	0.03	0.73	0.73	0.66	0.66	0.66
Sat Flow, veh/h	1753	1841	1560	963	830	1560	1781	3538	93	553	3458	160
Grp Volume(v), veh/h	79	95	131	54	0	8	83	499	520	12	749	781
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1793	0	1560	1781	1777	1854	553	1777	1841
Q Serve(g_s), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	1.2	37.7	38.0
Cycle Q Clear(g_c), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	5.8	37.7	38.0
Prop In Lane	1.00		1.00	0.54		1.00	1.00		0.05	1.00		0.09
Lane Grp Cap(c), veh/h	180	189	160	74	0	65	242	1298	1354	394	1165	1207
V/C Ratio(X)	0.44	0.50	0.82	0.73	0.00	0.12	0.34	0.38	0.38	0.03	0.64	0.65
Avail Cap(c_a), veh/h	374	393	333	382	0	333	275	1298	1354	394	1165	1207
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	0.00	1.00	1.00	1.00	1.00	0.85	0.85	0.85
Uniform Delay (d), s/veh	63.2	63.7	65.9	71.1	0.0	69.3	14.1	7.6	7.6	10.8	15.4	15.4
Incr Delay (d2), s/veh	1.7	2.1	9.7	12.7	0.0	0.9	0.8	0.9	0.8	0.1	2.3	2.3
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(95%),veh/ln	5.3	6.4	9.2	4.2	0.0	0.6	1.7	10.2	10.5	0.3	21.6	22.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	65.7	75.7	83.8	0.0	70.1	14.9	8.4	8.4	10.9	17.7	17.7
LnGrp LOS	E	E	E	F	A	E	B	A	A	B	B	B
Approach Vol, veh/h		305			62			1102			1542	
Approach Delay, s/veh		69.8			82.0			8.9			17.7	
Approach LOS		E			F			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	105.1		12.2		116.4		21.4				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	4.2	40.0		6.5		17.8		14.3				
Green Ext Time (p_c), s	0.0	8.6		0.2		8.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			21.1									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	217	1160	43	54	1231
Future Volume (veh/h)	215	217	1160	43	54	1231
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	226	228	1221	45	57	1296
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	539	294	2384	88	326	2673
Arrive On Green	0.16	0.16	0.68	0.68	0.03	0.75
Sat Flow, veh/h	3401	1560	3589	129	1781	3647
Grp Volume(v), veh/h	226	228	620	646	57	1296
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1847	1781	1777
Q Serve(g_s), s	9.0	20.8	25.6	25.6	1.4	21.3
Cycle Q Clear(g_c), s	9.0	20.8	25.6	25.6	1.4	21.3
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	539	294	1212	1260	326	2673
V/C Ratio(X)	0.42	0.77	0.51	0.51	0.18	0.48
Avail Cap(c_a), veh/h	667	353	1212	1260	497	2673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh	56.9	57.8	11.7	11.7	8.8	7.2
Incr Delay (d2), s/veh	0.5	8.6	1.3	1.3	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.1	24.8	15.2	15.7	0.9	12.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.4	66.4	13.0	12.9	9.0	7.9
LnGrp LOS	E	E	B	B	A	A
Approach Vol, veh/h	454		1266			1353
Approach Delay, s/veh	61.9		13.0			7.9
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		119.6		30.4	10.5	109.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		23.3		22.8	3.4	27.6
Green Ext Time (p_c), s		15.0		0.9	0.1	12.3

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Future Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	452	0	241	317	4	202	0	181	0	0	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	975		548	1196	15	234	0	0	0	0	92
Arrive On Green	0.00	0.53	0.00	0.08	0.66	0.66	0.13	0.00	0.00	0.00	0.00	0.06
Sat Flow, veh/h	0	1841	0	1753	1814	23	1753	202		0	0	1560
Grp Volume(v), veh/h	0	452	0	241	0	321	202	60.7		0	0	37
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	975		548	0	1211	234			0	0	92
V/C Ratio(X)	0.00	0.46		0.44	0.00	0.26	0.86			0.00	0.00	0.40
Avail Cap(c_a), veh/h	0	975		697	0	1211	463			0	0	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	0.0	12.2	0.0	8.5	51.5			0.0	0.0	55.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.6	0.0	0.5	9.2			0.0	0.0	2.8
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
%ile BackOfQ(95%),veh/ln	0.0	12.9	0.0	5.0	0.0	6.3	10.8			0.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.3	0.0	12.7	0.0	9.1	60.7			0.0	0.0	57.9
LnGrp LOS	A	B		B	A	A	E			A	A	E
Approach Vol, veh/h		452	A		562						37	
Approach Delay, s/veh		19.3			10.6						57.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	22.2	13.1	15.7	70.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		10.7	15.7	4.8	9.2	20.6						
Green Ext Time (p_c), s		2.2	0.5	0.0	0.5	3.1						

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	570	40	46	508	32	40
Future Volume (veh/h)	570	40	46	508	32	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	600	42	48	535	34	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	669	360	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.61	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	600	42	48	535	34	42
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.9	0.7	0.6	7.5	0.8	1.1
Cycle Q Clear(g_c), s	12.9	0.7	0.6	7.5	0.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	669	360	1114	226	201
V/C Ratio(X)	0.76	0.06	0.13	0.48	0.15	0.21
Avail Cap(c_a), veh/h	2077	1760	540	2590	451	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	7.8	8.0	5.1	18.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.4	0.3	3.2	0.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	7.8	8.2	5.4	18.3	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	642			583	76	
Approach Delay, s/veh	12.5			5.7	18.5	
Approach LOS	B			A	B	

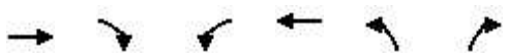
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		9.5		3.1	2.6	14.9
Green Ext Time (p_c), s		4.1		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	204	127	964	1254	0
Future Volume (vph)	0	204	127	964	1254	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	3539	3539	
Flt Permitted		1.00	0.17	1.00	1.00	
Satd. Flow (perm)		1611	321	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	215	134	1015	1320	0
RTOR Reduction (vph)	0	203	0	0	0	0
Lane Group Flow (vph)	0	12	134	1015	1320	0
Turn Type		Perm	pm+pt	NA	NA	
Protected Phases			1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)		7.8	121.7	121.7	108.6	
Effective Green, g (s)		7.8	121.7	121.7	108.6	
Actuated g/C Ratio		0.06	0.87	0.87	0.78	
Clearance Time (s)		4.5	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		89	352	3076	2745	
v/s Ratio Prot			0.02	c0.29	c0.37	
v/s Ratio Perm		c0.01	0.31			
v/c Ratio		0.13	0.38	0.33	0.48	
Uniform Delay, d1		62.9	3.4	1.7	5.6	
Progression Factor		1.00	1.00	1.00	1.90	
Incremental Delay, d2		0.7	0.7	0.3	0.5	
Delay (s)		63.6	4.1	2.0	11.2	
Level of Service		E	A	A	B	
Approach Delay (s)	63.6			2.2	11.2	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	465	204	0	473	127	0
Future Volume (vph)	465	204	0	473	127	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.6	
Lane Util. Factor	0.91	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	5085	1583		3539	1770	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	5085	1583		3539	1770	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	489	215	0	498	134	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	489	215	0	498	134	0
Turn Type	NA	Free		NA	pm+pt	
Protected Phases	3 8			3 4 7	1	
Permitted Phases		Free		1 2	6	
Actuated Green, G (s)	49.3	140.0		126.6	77.3	
Effective Green, g (s)	49.3	140.0		120.0	77.3	
Actuated g/C Ratio	0.35	1.00		0.86	0.55	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1790	1583		3033	977	
v/s Ratio Prot	c0.10			c0.06	0.04	
v/s Ratio Perm		c0.14		0.08	0.04	
v/c Ratio	0.27	0.14		0.16	0.14	
Uniform Delay, d1	32.5	0.0		1.7	15.2	
Progression Factor	1.00	1.00		1.00	1.01	
Incremental Delay, d2	0.1	0.2		0.0	0.1	
Delay (s)	32.6	0.2		1.7	15.4	
Level of Service	C	A		A	B	
Approach Delay (s)	22.7			1.7	15.4	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	739	85	296	111	1471	280	69	1560	543
v/c Ratio	0.99	0.28	0.86	0.38	0.86	0.24	0.43	0.79	0.23
Control Delay	50.7	17.9	62.5	48.3	35.8	1.1	23.1	28.1	0.5
Queue Delay	0.0	0.6	0.0	0.0	1.1	0.0	0.0	14.6	0.0
Total Delay	50.7	18.4	62.5	48.3	36.9	1.1	23.1	42.7	0.5
Queue Length 50th (ft)	~369	69	215	38	612	0	26	550	0
Queue Length 95th (ft)	#497	119	#307	68	#844	22	57	702	11
Internal Link Dist (ft)		85		523	527			3278	
Turn Bay Length (ft)			300			300	200		300
Base Capacity (vph)	748	430	344	548	1715	1152	159	2010	2391
Starvation Cap Reductn	0	158	0	0	89	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	468	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.31	0.86	0.20	0.90	0.24	0.43	1.01	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

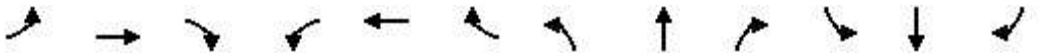
Lane Group	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	135	202	1751	1856
v/c Ratio	0.52	0.67	0.57	0.74
Control Delay	8.0	35.0	3.0	15.9
Queue Delay	0.0	0.0	0.2	8.5
Total Delay	8.0	35.0	3.2	24.3
Queue Length 50th (ft)	0	84	146	753
Queue Length 95th (ft)	5	165	181	926
Internal Link Dist (ft)			1562	527
Turn Bay Length (ft)		250		
Base Capacity (vph)	384	335	3092	2525
Starvation Cap Reductn	0	0	0	648
Spillback Cap Reductn	0	0	437	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.60	0.66	0.99

Intersection Summary

Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	824	135	626	202
v/c Ratio	0.46	0.09	0.18	0.20
Control Delay	36.2	0.1	0.1	9.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.2	0.1	0.1	9.1
Queue Length 50th (ft)	216	0	0	50
Queue Length 95th (ft)	245	0	0	53
Internal Link Dist (ft)	382		85	490
Turn Bay Length (ft)		250		
Base Capacity (vph)	2129	1583	3539	991
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	112	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.09	0.18	0.20

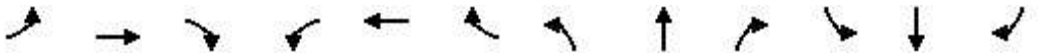
Intersection Summary

2045 Build Alternative 7 Intersection LOS Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	702	81	0	281	79	27	0	1397	266	66	1482	516
Future Volume (vph)	702	81	0	281	79	27	0	1397	266	66	1482	516
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5	6.6	6.6
Lane Util. Factor	0.97	1.00		1.00	0.95			0.95	1.00	1.00	0.95	0.88
Frt	1.00	1.00		1.00	0.96			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827		1736	3340			3539	1583	1770	3539	2787
Flt Permitted	0.95	1.00		0.70	1.00			1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	3367	1827		1282	3340			3539	1583	115	3539	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	739	85	0	296	83	28	0	1471	280	69	1560	543
RTOR Reduction (vph)	0	0	0	0	26	0	0	0	108	0	0	119
Lane Group Flow (vph)	739	85	0	296	85	0	0	1471	172	69	1560	424
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		pm+pt	NA			NA	pm+ov	pm+pt	NA	pt+ov
Protected Phases	3	8		7	4			6	7	5	1 2	1 2 3
Permitted Phases				4					6	1 2		
Actuated Green, G (s)	31.1	23.4		30.3	11.3			67.0	86.0	78.2	78.2	116.1
Effective Green, g (s)	31.1	23.4		30.3	11.3			67.0	86.0	71.6	78.2	109.3
Actuated g/C Ratio	0.22	0.17		0.22	0.08			0.48	0.61	0.51	0.56	0.78
Clearance Time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		
Lane Grp Cap (vph)	747	305		339	269			1693	972	138	1976	2175
v/s Ratio Prot	c0.22	0.05		0.12	0.03			c0.42	0.02	0.02	c0.44	0.15
v/s Ratio Perm				c0.07					0.08	0.23		
v/c Ratio	0.99	0.28		0.87	0.32			0.87	0.18	0.50	0.79	0.19
Uniform Delay, d1	54.3	50.9		51.9	60.7			32.6	11.7	28.6	24.4	4.0
Progression Factor	0.34	0.31		1.00	1.00			0.93	0.59	1.00	1.00	1.00
Incremental Delay, d2	28.9	0.5		21.1	0.7			5.4	0.1	2.8	2.2	0.0
Delay (s)	47.4	16.2		73.0	61.4			35.7	7.0	31.4	26.6	4.0
Level of Service	D	B		E	E			D	A	C	C	A
Approach Delay (s)		44.2			69.9			31.1			21.1	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Future Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	0	93	21	35	33	121	1597	23	22	1764	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	324	0	144	30	51	70	187	2644	38	212	2293	96
Arrive On Green	0.06	0.00	0.06	0.04	0.04	0.04	0.03	0.74	0.74	0.66	0.66	0.66
Sat Flow, veh/h	3506	0	1560	678	1129	1560	1781	3586	52	312	3476	145
Grp Volume(v), veh/h	258	0	93	56	0	33	121	790	830	22	897	941
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1807	0	1560	1781	1777	1861	312	1777	1844
Q Serve(g_s), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	5.4	52.0	53.2
Cycle Q Clear(g_c), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	25.5	52.0	53.2
Prop In Lane	1.00		1.00	0.37		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	324	0	144	81	0	70	187	1310	1372	212	1172	1217
V/C Ratio(X)	0.80	0.00	0.65	0.69	0.00	0.47	0.65	0.60	0.60	0.10	0.76	0.77
Avail Cap(c_a), veh/h	584	0	260	373	0	322	215	1310	1372	212	1172	1217
HCM Platoon Ratio	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	69.0	0.0	68.0	70.6	0.0	69.9	26.3	9.3	9.3	18.1	17.5	17.7
Incr Delay (d2), s/veh	4.5	0.0	4.8	9.9	0.0	4.8	5.4	2.1	2.0	0.6	3.0	3.0
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(95%),veh/ln	9.0	0.0	6.8	4.2	0.0	2.4	5.7	18.0	18.7	0.8	27.4	28.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	0.0	72.8	80.5	0.0	74.7	31.6	11.4	11.3	18.7	20.5	20.8
LnGrp LOS	E	A	E	F	A	E	C	B	B	B	C	C
Approach Vol, veh/h		351			89			1741			1860	
Approach Delay, s/veh		73.3			78.3			12.8			20.6	
Approach LOS		E			E			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.6	105.8		12.7		117.4		19.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	5.2	55.2		6.6		33.7		12.9				
Green Ext Time (p_c), s	0.1	5.2		0.3		18.0		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			23.1									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	102	1716	279	289	1892
Future Volume (veh/h)	98	102	1716	279	289	1892
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	107	1806	294	304	1992
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	250	338	2010	318	328	2975
Arrive On Green	0.07	0.07	0.65	0.65	0.14	0.84
Sat Flow, veh/h	3401	1560	3166	487	1781	3647
Grp Volume(v), veh/h	103	107	1023	1077	304	1992
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1783	1781	1777
Q Serve(g_s), s	4.3	8.7	70.4	79.2	19.1	31.1
Cycle Q Clear(g_c), s	4.3	8.7	70.4	79.2	19.1	31.1
Prop In Lane	1.00	1.00		0.27	1.00	
Lane Grp Cap(c), veh/h	250	338	1162	1166	328	2975
V/C Ratio(X)	0.41	0.32	0.88	0.92	0.93	0.67
Avail Cap(c_a), veh/h	395	404	1162	1166	381	2975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.25	0.25	1.00	1.00
Uniform Delay (d), s/veh	66.4	49.4	21.2	22.7	53.4	4.5
Incr Delay (d2), s/veh	1.1	0.5	2.7	4.2	26.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	12.6	33.1	37.5	19.9	14.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	49.9	23.9	26.8	79.8	5.7
LnGrp LOS	E	D	C	C	E	A
Approach Vol, veh/h	210		2100			2296
Approach Delay, s/veh	58.6		25.4			15.5
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		132.4		17.6	27.5	104.9
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		33.1		10.7	21.1	81.2
Green Ext Time (p_c), s		37.8		0.4	0.4	5.5

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Future Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	527	0	219	499	3	302	0	331	0	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	770		380	1037	6	339	0	0	0	0	24
Arrive On Green	0.00	0.42	0.00	0.07	0.57	0.57	0.19	0.00	0.00	0.00	0.00	0.02
Sat Flow, veh/h	0	1841	0	1753	1828	11	1753	302		0	0	1560
Grp Volume(v), veh/h	0	527	0	219	0	502	302	54.3		0	0	6
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1839	1753	D		0	0	1560
Q Serve(g_s), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	770		380	0	1043	339			0	0	24
V/C Ratio(X)	0.00	0.68		0.58	0.00	0.48	0.89			0.00	0.00	0.25
Avail Cap(c_a), veh/h	0	770		380	0	1043	355			0	0	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.1	0.0	14.3	0.0	10.4	31.6			0.0	0.0	39.2
Incr Delay (d2), s/veh	0.0	4.9	0.0	2.2	0.0	1.6	22.6			0.0	0.0	5.2
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
%ile BackOfQ(95%),veh/ln	0.0	13.3	0.0	3.9	0.0	8.9	12.2			0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.0	0.0	16.5	0.0	12.0	54.3			0.0	0.0	44.3
LnGrp LOS	A	C		B	A	B	D			A	A	D
Approach Vol, veh/h		527	A		721						6	
Approach Delay, s/veh		24.0			13.3						44.3	
Approach LOS		C			B						D	

Timer - Assigned Phs	2	3	4	5	6
Phs Duration (G+Y+Rc), s	51.7	21.6	7.3	12.0	39.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	45.7	16.3	10.0	6.0	33.7
Max Q Clear Time (g_c+I1), s	15.1	15.5	2.3	7.5	20.8
Green Ext Time (p_c), s	3.5	0.1	0.0	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	775	70	132	690	17	24
Future Volume (veh/h)	775	70	132	690	17	24
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	74	139	726	18	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	827	343	1289	171	153
Arrive On Green	0.53	0.53	0.07	0.70	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	816	74	139	726	18	25
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	23.0	1.4	1.9	12.0	0.6	0.9
Cycle Q Clear(g_c), s	23.0	1.4	1.9	12.0	0.6	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	827	343	1289	171	153
V/C Ratio(X)	0.84	0.09	0.41	0.56	0.11	0.16
Avail Cap(c_a), veh/h	1758	1489	416	2147	171	153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.1	11.0	4.6	25.2	25.4
Incr Delay (d2), s/veh	2.0	0.0	0.8	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.7	1.4	5.1	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	7.2	11.7	4.9	25.5	25.9
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	890			865	43	
Approach Delay, s/veh	13.6			6.0	25.7	
Approach LOS	B			A	C	

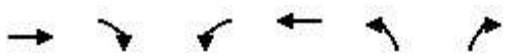
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		12.0	10.4	38.9
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		14.0		2.9	3.9	25.0
Green Ext Time (p_c), s		6.4		0.0	0.1	7.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	128	192	1663	1763	0
Future Volume (vph)	0	128	192	1663	1763	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	3539	3539	
Flt Permitted		1.00	0.07	1.00	1.00	
Satd. Flow (perm)		1611	124	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	135	202	1751	1856	0
RTOR Reduction (vph)	0	130	0	0	0	0
Lane Group Flow (vph)	0	5	202	1751	1856	0
Turn Type		Perm	pm+pt	NA	NA	
Protected Phases			1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)		5.6	122.4	122.4	99.9	
Effective Green, g (s)		5.6	122.4	122.4	99.9	
Actuated g/C Ratio		0.04	0.87	0.87	0.71	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		64	302	3094	2525	
v/s Ratio Prot			0.08	c0.49	c0.52	
v/s Ratio Perm		c0.00	0.51			
v/c Ratio		0.08	0.67	0.57	0.74	
Uniform Delay, d1		64.7	34.4	2.2	12.1	
Progression Factor		1.00	1.00	1.00	1.11	
Incremental Delay, d2		0.6	5.5	0.8	1.2	
Delay (s)		65.3	40.0	2.9	14.5	
Level of Service		E	D	A	B	
Approach Delay (s)	65.3			6.8	14.5	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	783	128	0	595	192	0
Future Volume (vph)	783	128	0	595	192	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.6	
Lane Util. Factor	0.91	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	5085	1583		3539	1770	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	5085	1583		3539	1770	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	824	135	0	626	202	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	824	135	0	626	202	0
Turn Type	NA	Free		NA	pm+pt	
Protected Phases	3 8			3 4 7	1	
Permitted Phases		Free		1 2	6	
Actuated Green, G (s)	48.4	140.0		126.6	78.2	
Effective Green, g (s)	48.4	140.0		120.0	78.2	
Actuated g/C Ratio	0.35	1.00		0.86	0.56	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1757	1583		3033	988	
v/s Ratio Prot	c0.16			c0.07	c0.05	
v/s Ratio Perm		0.09		0.11	0.06	
v/c Ratio	0.47	0.09		0.21	0.20	
Uniform Delay, d1	35.8	0.0		1.7	15.4	
Progression Factor	1.00	1.00		1.00	0.55	
Incremental Delay, d2	0.2	0.1		0.0	0.1	
Delay (s)	36.0	0.1		1.8	8.6	
Level of Service	D	A		A	A	
Approach Delay (s)	30.9			1.8	8.6	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	523	97	0	288	151	45	0	1106	294	85	1448	566
Future Volume (vph)	523	97	0	288	151	45	0	1106	294	85	1448	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5	6.6	6.6
Lane Util. Factor	0.97	1.00		1.00	0.95			0.95	1.00	1.00	0.95	0.88
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827		1736	3352			3539	1583	1770	3539	2787
Flt Permitted	0.95	1.00		0.69	1.00			1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	3367	1827		1263	3352			3539	1583	161	3539	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	551	102	0	303	159	47	0	1164	309	89	1524	596
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	132	0	0	136
Lane Group Flow (vph)	551	102	0	303	185	0	0	1164	177	89	1524	460
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		pm+pt	NA			NA	pm+ov	pm+pt	NA	pt+ov
Protected Phases	3	8		7	4			6	7	5	1 2	1 2 3
Permitted Phases				4					6	1 2		
Actuated Green, G (s)	30.2	27.9		35.7	16.7			61.4	80.4	73.7	73.7	110.7
Effective Green, g (s)	30.2	27.9		35.7	16.7			61.4	80.4	67.1	73.7	103.9
Actuated g/C Ratio	0.22	0.20		0.26	0.12			0.44	0.57	0.48	0.53	0.74
Clearance Time (s)	6.0	6.6		6.0	6.6			6.8	6.0	4.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		
Lane Grp Cap (vph)	726	364		386	399			1552	909	166	1863	2068
v/s Ratio Prot	c0.16	0.06		0.11	0.06			0.33	0.03	0.03	c0.43	0.17
v/s Ratio Perm				c0.09					0.09	0.23		
v/c Ratio	0.76	0.28		0.78	0.46			0.75	0.20	0.54	0.82	0.22
Uniform Delay, d1	51.5	47.5		47.1	57.5			32.9	14.3	26.5	27.6	5.6
Progression Factor	0.42	0.36		1.00	1.00			0.87	0.42	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.4		10.1	0.9			3.0	0.1	3.3	2.9	0.1
Delay (s)	25.8	17.3		57.2	58.3			31.6	6.1	29.8	30.5	5.6
Level of Service	C	B		E	E			C	A	C	C	A
Approach Delay (s)		24.5			57.7			26.3			23.8	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Future Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	103	178	41	27	11	115	1472	39	14	1765	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	233	245	207	55	36	80	165	2442	65	210	2125	87
Arrive On Green	0.13	0.13	0.13	0.02	0.02	0.02	0.04	0.69	0.69	0.61	0.61	0.61
Sat Flow, veh/h	1753	1841	1560	1077	709	1560	1781	3537	94	346	3478	143
Grp Volume(v), veh/h	86	103	178	68	0	11	115	739	772	14	897	941
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1787	0	1560	1781	1777	1854	346	1777	1845
Q Serve(g_s), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	3.4	59.5	60.8
Cycle Q Clear(g_c), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	24.6	59.5	60.8
Prop In Lane	1.00		1.00	0.60		1.00	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	233	245	207	92	0	80	165	1227	1280	210	1086	1127
V/C Ratio(X)	0.37	0.42	0.86	0.74	0.00	0.14	0.70	0.60	0.60	0.07	0.83	0.84
Avail Cap(c_a), veh/h	374	393	333	381	0	333	190	1227	1280	210	1086	1127
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	1.00	0.00	1.00	1.00	1.00	1.00	0.54	0.54	0.54
Uniform Delay (d), s/veh	59.3	59.7	63.7	72.7	0.0	70.4	31.5	12.3	12.3	22.0	22.9	23.2
Incr Delay (d2), s/veh	1.0	1.2	12.0	11.0	0.0	0.8	8.9	2.2	2.1	0.3	4.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.5	6.7	11.8	5.3	0.0	0.8	5.5	19.4	20.2	0.5	31.4	33.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	60.9	75.7	83.7	0.0	71.2	40.4	14.5	14.4	22.4	27.0	27.3
LnGrp LOS	E	E	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		367			79			1626			1852	
Approach Delay, s/veh		67.9			82.0			16.3			27.1	
Approach LOS		E			F			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.9	98.4		13.7		110.4		25.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	5.5	62.8		7.7		35.2		18.8				
Green Ext Time (p_c), s	0.0	0.0		0.3		14.4		1.2				

Intersection Summary			
HCM 6th Ctrl Delay		27.5	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	287	1701	54	67	1775
Future Volume (veh/h)	302	287	1701	54	67	1775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	302	1791	57	71	1868
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	667	355	2261	72	172	2540
Arrive On Green	0.20	0.20	0.64	0.64	0.03	0.71
Sat Flow, veh/h	3401	1560	3609	111	1781	3647
Grp Volume(v), veh/h	318	302	901	947	71	1868
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1850	1781	1777
Q Serve(g_s), s	12.4	27.8	55.1	56.1	1.9	47.4
Cycle Q Clear(g_c), s	12.4	27.8	55.1	56.1	1.9	47.4
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	667	355	1143	1190	172	2540
V/C Ratio(X)	0.48	0.85	0.79	0.80	0.41	0.74
Avail Cap(c_a), veh/h	667	355	1143	1190	341	2540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.53	0.53	1.00	1.00
Uniform Delay (d), s/veh	53.5	55.5	19.4	19.6	23.3	12.9
Incr Delay (d2), s/veh	0.5	17.5	3.0	3.0	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	32.1	28.6	30.1	2.5	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	73.0	22.4	22.6	24.9	14.8
LnGrp LOS	D	E	C	C	C	B
Approach Vol, veh/h	620		1848			1939
Approach Delay, s/veh	63.3		22.5			15.2
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.0		36.0	10.7	103.3
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		49.4		29.8	3.9	58.1
Green Ext Time (p_c), s		28.3		0.0	0.1	16.2

Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

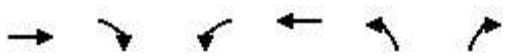
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Future Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	621	0	341	467	6	244	0	257	0	0	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	866		420	1151	15	275	0	0	0	0	103
Arrive On Green	0.00	0.47	0.00	0.12	0.63	0.63	0.16	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1813	23	1753	244		0	0	1560
Grp Volume(v), veh/h	0	621	0	341	0	473	244	64.3		0	0	51
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Cycle Q Clear(g_c), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	866		420	0	1165	275			0	0	103
V/C Ratio(X)	0.00	0.72		0.81	0.00	0.41	0.89			0.00	0.00	0.50
Avail Cap(c_a), veh/h	0	866		494	0	1165	445			0	0	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.7	0.0	21.4	0.0	11.3	52.1			0.0	0.0	56.8
Incr Delay (d2), s/veh	0.0	5.1	0.0	8.6	0.0	1.1	12.2			0.0	0.0	3.6
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
%ile BackOfQ(95%),veh/ln	0.0	22.4	0.0	9.6	0.0	10.9	13.3			0.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.7	0.0	30.0	0.0	12.4	64.3			0.0	0.0	60.5
LnGrp LOS	A	C		C	A	B	E			A	A	E
Approach Vol, veh/h		621	A		814						51	
Approach Delay, s/veh		31.7			19.8						60.5	
Approach LOS		C			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	25.8	14.3	20.7	65.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		18.0	19.2	6.0	14.1	36.0						
Green Ext Time (p_c), s		3.5	0.6	0.1	0.6	4.0						

Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	55	66	759	44	54
Future Volume (veh/h)	766	55	66	759	44	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	806	58	69	799	46	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	968	820	323	1260	180	160
Arrive On Green	0.53	0.53	0.06	0.68	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	806	58	69	799	46	57
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	21.6	1.1	0.9	14.1	1.4	2.0
Cycle Q Clear(g_c), s	21.6	1.1	0.9	14.1	1.4	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	968	820	323	1260	180	160
V/C Ratio(X)	0.83	0.07	0.21	0.63	0.26	0.36
Avail Cap(c_a), veh/h	1660	1407	435	2070	361	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	6.8	9.8	5.1	24.1	24.4
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.5	0.6	6.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	6.9	10.1	5.7	24.8	25.7
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	864			868	103	
Approach Delay, s/veh	13.2			6.0	25.3	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.3		12.0	9.3	37.1
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		16.1		4.0	2.9	23.6
Green Ext Time (p_c), s		7.4		0.1	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	267	177	1400	1736	0
Future Volume (vph)	0	267	177	1400	1736	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	
Frt		0.86	1.00	1.00	1.00	
Flt Protected		1.00	0.95	1.00	1.00	
Satd. Flow (prot)		1611	1770	3539	3539	
Flt Permitted		1.00	0.06	1.00	1.00	
Satd. Flow (perm)		1611	113	3539	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	281	186	1474	1827	0
RTOR Reduction (vph)	0	168	0	0	0	0
Lane Group Flow (vph)	0	113	186	1474	1827	0
Turn Type		Perm	pm+pt	NA	NA	
Protected Phases			1	6	2	
Permitted Phases		8	6			
Actuated Green, G (s)		14.1	115.4	115.4	95.1	
Effective Green, g (s)		14.1	115.4	115.4	95.1	
Actuated g/C Ratio		0.10	0.82	0.82	0.68	
Clearance Time (s)		4.5	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		162	262	2917	2403	
v/s Ratio Prot			c0.07	0.42	c0.52	
v/s Ratio Perm		c0.07	0.51			
v/c Ratio		0.70	0.71	0.51	0.76	
Uniform Delay, d1		60.9	36.4	3.7	14.9	
Progression Factor		1.00	1.00	1.00	0.83	
Incremental Delay, d2		12.2	8.5	0.6	1.4	
Delay (s)		73.1	44.9	4.3	13.8	
Level of Service		E	D	A	B	
Approach Delay (s)	73.1			8.9	13.8	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	620	267	0	717	177	0
Future Volume (vph)	620	267	0	717	177	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0		6.0	6.6	
Lane Util. Factor	0.91	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	0.95	
Satd. Flow (prot)	5085	1583		3539	1770	
Flt Permitted	1.00	1.00		1.00	0.95	
Satd. Flow (perm)	5085	1583		3539	1770	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	653	281	0	755	186	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	653	281	0	755	186	0
Turn Type	NA	Free		NA	pm+pt	
Protected Phases	3 8			3 4 7	1	
Permitted Phases		Free		1 2	6	
Actuated Green, G (s)	52.9	140.0		126.6	73.7	
Effective Green, g (s)	52.9	140.0		120.0	73.7	
Actuated g/C Ratio	0.38	1.00		0.86	0.53	
Clearance Time (s)					6.6	
Vehicle Extension (s)					3.0	
Lane Grp Cap (vph)	1921	1583		3033	931	
v/s Ratio Prot	c0.13			c0.09	0.04	
v/s Ratio Perm		0.18		0.12	0.07	
v/c Ratio	0.34	0.18		0.25	0.20	
Uniform Delay, d1	31.1	0.0		1.8	17.5	
Progression Factor	1.00	1.00		1.00	0.56	
Incremental Delay, d2	0.1	0.2		0.0	0.1	
Delay (s)	31.2	0.2		1.9	9.9	
Level of Service	C	A		A	A	
Approach Delay (s)	21.9			1.9	9.9	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	551	102	303	206	1164	309	89	1524	596
v/c Ratio	0.76	0.28	0.77	0.49	0.75	0.28	0.51	0.82	0.26
Control Delay	29.7	19.1	49.6	53.9	32.0	1.0	25.5	32.0	0.9
Queue Delay	1.3	1.5	0.0	0.0	0.4	0.0	0.0	16.3	0.0
Total Delay	31.0	20.5	49.6	53.9	32.4	1.0	25.5	48.4	0.9
Queue Length 50th (ft)	53	82	214	82	446	0	36	556	6
Queue Length 95th (ft)	#338	132	284	119	497	19	69	719	24
Internal Link Dist (ft)		85		523	527			3278	
Turn Bay Length (ft)			300			300	200		300
Base Capacity (vph)	726	408	392	556	1574	1102	176	1947	2303
Starvation Cap Reductn	56	180	0	0	103	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	449	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.45	0.77	0.37	0.79	0.28	0.51	1.02	0.26

Intersection Summary

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

Lane Group	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	281	186	1474	1827
v/c Ratio	0.85	0.71	0.51	0.76
Control Delay	43.5	41.0	4.9	15.6
Queue Delay	0.0	0.0	0.0	6.4
Total Delay	43.5	41.0	5.0	22.1
Queue Length 50th (ft)	85	83	175	751
Queue Length 95th (ft)	186	175	282	925
Internal Link Dist (ft)			1562	527
Turn Bay Length (ft)		250		
Base Capacity (vph)	405	289	2916	2403
Starvation Cap Reductn	0	0	0	532
Spillback Cap Reductn	0	0	66	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.64	0.52	0.98

Intersection Summary

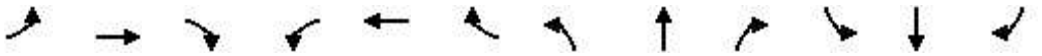
Lane Group	EBT	EBR	WBT	NBL
Lane Group Flow (vph)	653	281	755	186
v/c Ratio	0.34	0.18	0.21	0.20
Control Delay	31.4	0.2	0.1	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.4	0.2	0.1	10.2
Queue Length 50th (ft)	159	0	0	48
Queue Length 95th (ft)	182	0	0	47
Internal Link Dist (ft)	382		85	490
Turn Bay Length (ft)		250		
Base Capacity (vph)	2069	1583	3523	933
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	183	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.18	0.21	0.20

Intersection Summary

APPENDIX M

(Build Alternative 8 Intersection LOS Results)

2025 Build Alternative 8 Intersection LOS Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	540	78	196	195	0	0	956	335	0	1031	350
Future Volume (veh/h)	0	540	78	196	195	0	0	956	335	0	1031	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	568	82	206	205	0	0	1006	353	0	1085	368
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	0	2	2	0	2	2
Cap, veh/h	0	678	302	259	1084	0	0	2135	1888	0	2135	1676
Arrive On Green	0.00	0.19	0.19	0.08	0.31	0.00	0.00	0.40	0.40	0.00	0.60	0.60
Sat Flow, veh/h	0	3589	1560	3401	3589	0	0	3647	2790	0	3647	2790
Grp Volume(v), veh/h	0	568	82	206	205	0	0	1006	353	0	1085	368
Grp Sat Flow(s),veh/h/ln	0	1749	1560	1700	1749	0	0	1777	1395	0	1777	1395
Q Serve(g_s), s	0.0	23.4	6.7	8.9	6.4	0.0	0.0	31.3	10.0	0.0	26.3	9.1
Cycle Q Clear(g_c), s	0.0	23.4	6.7	8.9	6.4	0.0	0.0	31.3	10.0	0.0	26.3	9.1
Prop In Lane	0.00		1.00	1.00		0.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	0	678	302	259	1084	0	0	2135	1888	0	2135	1676
V/C Ratio(X)	0.00	0.84	0.27	0.80	0.19	0.00	0.00	0.47	0.19	0.00	0.51	0.22
Avail Cap(c_a), veh/h	0	942	420	476	1571	0	0	2135	1888	0	2135	1676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.91	0.91	0.00	0.83	0.83
Uniform Delay (d), s/veh	0.0	58.2	51.4	68.2	37.9	0.0	0.0	27.2	14.2	0.0	17.2	13.8
Incr Delay (d2), s/veh	0.0	4.9	0.5	5.6	0.1	0.0	0.0	0.7	0.2	0.0	0.7	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(95%),veh/ln	0.0	16.3	4.9	7.4	5.1	0.0	0.0	20.4	16.1	0.0	15.9	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	63.0	51.9	73.7	38.0	0.0	0.0	27.9	14.3	0.0	17.9	14.0
LnGrp LOS	A	E	D	E	D	A	A	C	B	A	B	B
Approach Vol, veh/h		650			411			1359			1453	
Approach Delay, s/veh		61.6			55.9			24.4			16.9	
Approach LOS		E			E			C			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		96.9		53.1		96.9	17.4	35.7				
Change Period (Y+Rc), s		6.8		6.6		6.8	6.0	6.6				
Max Green Setting (Gmax), s		69.2		67.4		69.2	21.0	40.4				
Max Q Clear Time (g_c+I1), s		28.3		8.4		33.3	10.9	25.4				
Green Ext Time (p_c), s		12.9		1.5		11.2	0.5	3.6				

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Future Volume (veh/h)	150	35	53	11	27	20	80	1016	14	15	1132	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	122	56	12	28	21	84	1069	15	16	1192	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	148	155	132	20	47	57	382	2703	38	386	2360	97
Arrive On Green	0.08	0.08	0.08	0.04	0.04	0.04	0.03	0.75	0.75	0.90	0.90	0.90
Sat Flow, veh/h	1753	1841	1560	544	1269	1560	1781	3588	50	520	3479	143
Grp Volume(v), veh/h	98	122	56	40	0	21	84	529	555	16	609	632
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1814	0	1560	1781	1777	1861	520	1777	1845
Q Serve(g_s), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	0.7	9.2	9.2
Cycle Q Clear(g_c), s	8.1	9.7	5.1	3.3	0.0	2.0	2.0	15.7	15.7	5.1	9.2	9.2
Prop In Lane	1.00		1.00	0.30		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	148	155	132	67	0	57	382	1339	1402	386	1206	1252
V/C Ratio(X)	0.66	0.79	0.43	0.60	0.00	0.37	0.22	0.40	0.40	0.04	0.50	0.51
Avail Cap(c_a), veh/h	292	307	260	375	0	322	415	1339	1402	386	1206	1252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	66.6	67.3	65.2	71.1	0.0	70.5	6.5	6.5	6.5	2.9	2.8	2.8
Incr Delay (d2), s/veh	5.0	8.5	2.2	8.3	0.0	3.8	0.3	0.9	0.8	0.2	1.3	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(95%),veh/ln	7.0	8.6	3.8	3.0	0.0	1.5	1.4	9.9	10.2	0.1	4.7	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	75.8	67.4	79.4	0.0	74.4	6.8	7.4	7.3	3.1	4.1	4.0
LnGrp LOS	E	E	E	E	A	E	A	A	A	A	A	A
Approach Vol, veh/h		276			61			1168			1257	
Approach Delay, s/veh		72.6			77.7			7.3			4.0	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	108.6		11.5		119.8		18.6				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	4.0	11.2		5.3		17.7		11.7				
Green Ext Time (p_c), s	0.0	12.1		0.2		9.5		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			13.9									
HCM 6th LOS			B									

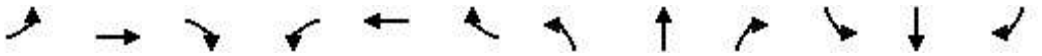
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	74	78	1153	211	217	1289
Future Volume (veh/h)	74	78	1153	211	217	1289
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	82	1214	222	228	1357
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	220	169	2289	416	410	3007
Arrive On Green	0.06	0.06	1.00	1.00	0.04	0.85
Sat Flow, veh/h	3401	1560	3097	545	1781	3647
Grp Volume(v), veh/h	78	82	715	721	228	1357
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1772	1781	1777
Q Serve(g_s), s	3.3	7.4	0.0	0.0	4.0	14.3
Cycle Q Clear(g_c), s	3.3	7.4	0.0	0.0	4.0	14.3
Prop In Lane	1.00	1.00		0.31	1.00	
Lane Grp Cap(c), veh/h	220	169	1354	1351	410	3007
V/C Ratio(X)	0.36	0.48	0.53	0.53	0.56	0.45
Avail Cap(c_a), veh/h	395	249	1354	1351	640	3007
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.90	0.90	1.00	1.00
Uniform Delay (d), s/veh	67.2	62.9	0.0	0.0	2.8	2.9
Incr Delay (d2), s/veh	1.0	2.1	1.3	1.4	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	10.8	0.9	0.9	2.4	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.1	65.1	1.3	1.4	4.0	3.4
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	160		1436			1585
Approach Delay, s/veh	66.6		1.3			3.5
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		133.7		16.3	12.6	121.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		16.3		9.4	6.0	2.0
Green Ext Time (p_c), s		16.5		0.3	0.6	16.8

Intersection Summary	
HCM 6th Ctrl Delay	5.7
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Future Volume (veh/h)	0	338	210	139	322	1	194	0	211	0	0	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	356	0	146	339	1	204	0	222	0	0	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	858		550	1119	3	248	0	0	0	0	13
Arrive On Green	0.00	0.47	0.00	0.06	0.61	0.61	0.14	0.00	0.00	0.00	0.00	0.01
Sat Flow, veh/h	0	1841	0	1753	1834	5	1753	204		0	0	1560
Grp Volume(v), veh/h	0	356	0	146	0	340	204	39.5		0	0	3
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1840	1753	D		0	0	1560
Q Serve(g_s), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Cycle Q Clear(g_c), s	0.0	9.6	0.0	3.0	0.0	6.6	8.5			0.0	0.0	0.1
Prop In Lane	0.00		0.00	1.00		0.00	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	858		550	0	1123	248			0	0	13
V/C Ratio(X)	0.00	0.42		0.27	0.00	0.30	0.82			0.00	0.00	0.24
Avail Cap(c_a), veh/h	0	858		577	0	1123	382			0	0	208
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.2	0.0	9.1	0.0	7.0	31.2			0.0	0.0	36.9
Incr Delay (d2), s/veh	0.0	1.5	0.0	0.3	0.0	0.7	8.3			0.0	0.0	9.4
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
%ile BackOfQ(95%),veh/ln	0.0	7.2	0.0	1.9	0.0	4.3	7.3			0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.7	0.0	9.3	0.0	7.7	39.5			0.0	0.0	46.3
LnGrp LOS	A	B		A	A	A	D			A	A	D
Approach Vol, veh/h		356	A		486						3	
Approach Delay, s/veh		14.7			8.2						46.3	
Approach LOS		B			A						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		51.7	16.6	6.6	10.8	40.9						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		45.7	16.3	10.0	6.0	33.7						
Max Q Clear Time (g_c+I1), s		8.6	10.5	2.1	5.0	11.6						
Green Ext Time (p_c), s		2.2	0.3	0.0	0.0	2.1						

Intersection Summary												
HCM 6th Ctrl Delay			16.6									
HCM 6th LOS			B									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	44	90	458	11	16
Future Volume (veh/h)	526	44	90	458	11	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	554	46	95	482	12	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	769	652	416	1133	220	195
Arrive On Green	0.42	0.42	0.07	0.62	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	554	46	95	482	12	17
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.0	0.8	1.3	6.5	0.3	0.5
Cycle Q Clear(g_c), s	12.0	0.8	1.3	6.5	0.3	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	769	652	416	1133	220	195
V/C Ratio(X)	0.72	0.07	0.23	0.43	0.05	0.09
Avail Cap(c_a), veh/h	2253	1909	545	2752	220	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	8.4	7.8	4.8	18.4	18.5
Incr Delay (d2), s/veh	1.3	0.0	0.3	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	0.4	0.6	2.7	0.2	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	8.4	8.1	5.0	18.5	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	600			577	29	
Approach Delay, s/veh	12.6			5.5	18.6	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.9		12.0	9.5	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		8.5		2.5	3.3	14.0
Green Ext Time (p_c), s		3.5		0.0	0.1	4.4

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	486	956	0	26	1381
Future Volume (veh/h)	0	486	956	0	26	1381
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	512	1006	0	27	1454
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	2	2
Cap, veh/h	303	610	2443	0	404	2665
Arrive On Green	0.00	0.17	0.69	0.00	0.02	0.75
Sat Flow, veh/h	1781	3170	3741	0	1781	3647
Grp Volume(v), veh/h	0	512	1006	0	27	1454
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	0	1781	1777
Q Serve(g_s), s	0.0	23.3	18.5	0.0	0.6	26.0
Cycle Q Clear(g_c), s	0.0	23.3	18.5	0.0	0.6	26.0
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	303	610	2443	0	404	2665
V/C Ratio(X)	0.00	0.84	0.41	0.00	0.07	0.55
Avail Cap(c_a), veh/h	309	621	2443	0	435	2665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.86	0.00	0.89	0.89
Uniform Delay (d), s/veh	0.0	58.3	10.2	0.0	7.3	7.9
Incr Delay (d2), s/veh	0.0	9.8	0.4	0.0	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	27.5	11.4	0.0	0.4	14.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	68.1	10.7	0.0	7.4	8.7
LnGrp LOS	A	E	B	A	A	A
Approach Vol, veh/h	512		1006			1481
Approach Delay, s/veh	68.1		10.7			8.6
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		118.5		31.5	9.4	109.1
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		112.0		26.0	6.0	100.0
Max Q Clear Time (g_c+I1), s		28.0		25.3	2.6	20.5
Green Ext Time (p_c), s		18.8		0.2	0.0	9.7

Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCS7 Roundabouts Report

General Information

Analyst	GOAL Associates
Agency or Co.	FDOT District 4
Date Performed	8/2/2023
Analysis Year	2025
Time Analyzed	AM Peak Period
Project Description	SR 5/US-1 at Aviation Blvd P...

Site Information

Intersection	SR 5/US-1 & Aviation Blvd
E/W Street Name	Aviation Blvd.
N/S Street Name	SR 5/US-1/Federal Hwy
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	Vero Beach

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT		T				TR								LR	
Volume (V), veh/h	140	475	260		0		251	11					0	26		5
Percent Heavy Vehicles, %	3	3	3		3		3	3					3	3		3
Flow Rate (v_{PCE}), pc/h	152	515	282		0		272	12					0	28		5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.5436	4.5436			4.9763						4.9763	
Follow-Up Headway (s)	2.5352	2.5352			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	446	503			284						33	
Entry Volume, veh/h	433	488			276						32	
Circulating Flow (v_c), pc/h	28			667			977			424		
Exiting Flow (v_{ex}), pc/h	310			429			527			0		
Capacity (c_{pce}), pc/h	1384	1384			699						895	
Capacity (c), veh/h	1344	1344			679						869	
v/c Ratio (x)	0.32	0.36			0.41						0.04	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	5.6	6.0			10.9						4.5	
Lane LOS	A	A			B						A	
95% Queue, veh	1.4	1.7			2.0						0.1	
Approach Delay, s/veh	5.8			10.9						4.5		
Approach LOS	A			B						A		
Intersection Delay, s/veh | LOS	6.9						A					

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	465	204	200	233	0	0	745	346	0	1054	367
Future Volume (veh/h)	0	465	204	200	233	0	0	745	346	0	1054	367
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	489	215	211	245	0	0	784	364	0	1109	386
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	0	2	2	0	2	2
Cap, veh/h	0	600	267	265	1022	0	0	2175	1925	0	2175	1708
Arrive On Green	0.00	0.17	0.17	0.08	0.29	0.00	0.00	0.61	0.61	0.00	0.61	0.61
Sat Flow, veh/h	0	3589	1560	3401	3589	0	0	3647	2790	0	3647	2790
Grp Volume(v), veh/h	0	489	215	211	245	0	0	784	364	0	1109	386
Grp Sat Flow(s),veh/h/ln	0	1749	1560	1700	1749	0	0	1777	1395	0	1777	1395
Q Serve(g_s), s	0.0	18.9	18.5	8.5	7.5	0.0	0.0	15.4	6.5	0.0	24.6	8.7
Cycle Q Clear(g_c), s	0.0	18.9	18.5	8.5	7.5	0.0	0.0	15.4	6.5	0.0	24.6	8.7
Prop In Lane	0.00		1.00	1.00		0.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	0	600	267	265	1022	0	0	2175	1925	0	2175	1708
V/C Ratio(X)	0.00	0.82	0.80	0.80	0.24	0.00	0.00	0.36	0.19	0.00	0.51	0.23
Avail Cap(c_a), veh/h	0	809	361	413	1384	0	0	2175	1925	0	2175	1708
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)	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.92	0.92	0.00	0.84	0.84
Uniform Delay (d), s/veh	0.0	55.9	55.7	63.5	37.7	0.0	0.0	13.5	7.7	0.0	15.3	12.2
Incr Delay (d2), s/veh	0.0	4.8	9.1	5.9	0.1	0.0	0.0	0.4	0.2	0.0	0.7	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(95%),veh/ln	0.0	13.6	12.6	7.1	5.9	0.0	0.0	10.2	14.1	0.0	14.8	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	60.6	64.9	69.3	37.8	0.0	0.0	13.9	7.9	0.0	16.0	12.5
LnGrp LOS	A	E	E	E	D	A	A	B	A	A	B	B
Approach Vol, veh/h		704			456			1148			1495	
Approach Delay, s/veh		61.9			52.4			12.0			15.1	
Approach LOS		E			D			B			B	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		92.5		47.5		92.5	16.9	30.6				
Change Period (Y+Rc), s		6.8		6.6		6.8	6.0	6.6				
Max Green Setting (Gmax), s		71.2		55.4		71.2	17.0	32.4				
Max Q Clear Time (g_c+I1), s		26.6		9.5		17.4	10.5	20.9				
Green Ext Time (p_c), s		13.7		1.7		9.0	0.4	3.1				

Intersection Summary												
HCM 6th Ctrl Delay			27.3									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Future Volume (veh/h)	112	38	124	28	24	8	79	943	25	11	1389	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	79	95	131	29	25	8	83	993	26	12	1462	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	180	189	160	40	34	65	242	2585	68	394	2267	105
Arrive On Green	0.10	0.10	0.10	0.04	0.04	0.04	0.03	0.73	0.73	0.66	0.66	0.66
Sat Flow, veh/h	1753	1841	1560	963	830	1560	1781	3538	93	553	3458	160
Grp Volume(v), veh/h	79	95	131	54	0	8	83	499	520	12	749	781
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1793	0	1560	1781	1777	1854	553	1777	1841
Q Serve(g_s), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	1.2	37.7	38.0
Cycle Q Clear(g_c), s	6.4	7.3	12.3	4.5	0.0	0.7	2.2	15.8	15.8	5.8	37.7	38.0
Prop In Lane	1.00		1.00	0.54		1.00	1.00		0.05	1.00		0.09
Lane Grp Cap(c), veh/h	180	189	160	74	0	65	242	1298	1354	394	1165	1207
V/C Ratio(X)	0.44	0.50	0.82	0.73	0.00	0.12	0.34	0.38	0.38	0.03	0.64	0.65
Avail Cap(c_a), veh/h	374	393	333	382	0	333	275	1298	1354	394	1165	1207
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	0.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	63.2	63.7	65.9	71.1	0.0	69.3	14.1	7.6	7.6	10.8	15.4	15.4
Incr Delay (d2), s/veh	1.7	2.1	9.7	12.7	0.0	0.9	0.8	0.9	0.8	0.1	2.2	2.2
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(95%),veh/ln	5.3	6.4	9.2	4.2	0.0	0.6	1.7	10.2	10.5	0.3	21.4	22.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	65.7	75.7	83.8	0.0	70.1	14.9	8.4	8.4	10.9	17.6	17.6
LnGrp LOS	E	E	E	F	A	E	B	A	A	B	B	B
Approach Vol, veh/h		305			62			1102			1542	
Approach Delay, s/veh		69.8			82.0			8.9			17.5	
Approach LOS		E			F			A			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	105.1		12.2		116.4		21.4				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	4.2	40.0		6.5		17.8		14.3				
Green Ext Time (p_c), s	0.0	8.6		0.2		8.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	215	217	1160	43	54	1231
Future Volume (veh/h)	215	217	1160	43	54	1231
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	226	228	1221	45	57	1296
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	539	294	2384	88	326	2673
Arrive On Green	0.16	0.16	0.68	0.68	0.03	0.75
Sat Flow, veh/h	3401	1560	3589	129	1781	3647
Grp Volume(v), veh/h	226	228	620	646	57	1296
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1847	1781	1777
Q Serve(g_s), s	9.0	20.8	25.6	25.6	1.4	21.3
Cycle Q Clear(g_c), s	9.0	20.8	25.6	25.6	1.4	21.3
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	539	294	1212	1260	326	2673
V/C Ratio(X)	0.42	0.77	0.51	0.51	0.18	0.48
Avail Cap(c_a), veh/h	667	353	1212	1260	497	2673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.94	0.94	1.00	1.00
Uniform Delay (d), s/veh	56.9	57.8	11.7	11.7	8.8	7.2
Incr Delay (d2), s/veh	0.5	8.6	1.5	1.4	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.1	24.8	15.5	16.0	0.9	12.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.4	66.4	13.1	13.1	9.0	7.9
LnGrp LOS	E	E	B	B	A	A
Approach Vol, veh/h	454		1266			1353
Approach Delay, s/veh	61.9		13.1			7.9
Approach LOS	E		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		119.6		30.4	10.5	109.1
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		23.3		22.8	3.4	27.6
Green Ext Time (p_c), s		15.0		0.9	0.1	12.3

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Future Volume (veh/h)	0	429	262	229	301	4	192	0	172	0	0	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	452	0	241	317	4	202	0	181	0	0	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	975		548	1196	15	234	0	0	0	0	92
Arrive On Green	0.00	0.53	0.00	0.08	0.66	0.66	0.13	0.00	0.00	0.00	0.00	0.06
Sat Flow, veh/h	0	1841	0	1753	1814	23	1753	202		0	0	1560
Grp Volume(v), veh/h	0	452	0	241	0	321	202	60.7		0	0	37
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	18.6	0.0	7.2	0.0	8.7	13.7			0.0	0.0	2.8
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	975		548	0	1211	234			0	0	92
V/C Ratio(X)	0.00	0.46		0.44	0.00	0.26	0.86			0.00	0.00	0.40
Avail Cap(c_a), veh/h	0	975		697	0	1211	463			0	0	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	0.0	12.2	0.0	8.5	51.5			0.0	0.0	55.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.6	0.0	0.5	9.2			0.0	0.0	2.8
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
%ile BackOfQ(95%),veh/ln	0.0	12.9	0.0	5.0	0.0	6.3	10.8			0.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.3	0.0	12.7	0.0	9.1	60.7			0.0	0.0	57.9
LnGrp LOS	A	B		B	A	A	E			A	A	E
Approach Vol, veh/h		452	A		562						37	
Approach Delay, s/veh		19.3			10.6						57.9	
Approach LOS		B			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	22.2	13.1	15.7	70.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		10.7	15.7	4.8	9.2	20.6						
Green Ext Time (p_c), s		2.2	0.5	0.0	0.5	3.1						

Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	570	40	46	508	32	40
Future Volume (veh/h)	570	40	46	508	32	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	600	42	48	535	34	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	790	669	360	1114	226	201
Arrive On Green	0.43	0.43	0.05	0.61	0.13	0.13
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	600	42	48	535	34	42
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	12.9	0.7	0.6	7.5	0.8	1.1
Cycle Q Clear(g_c), s	12.9	0.7	0.6	7.5	0.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	790	669	360	1114	226	201
V/C Ratio(X)	0.76	0.06	0.13	0.48	0.15	0.21
Avail Cap(c_a), veh/h	2077	1760	540	2590	451	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.3	7.8	8.0	5.1	18.0	18.2
Incr Delay (d2), s/veh	1.5	0.0	0.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	0.4	0.3	3.2	0.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.8	7.8	8.2	5.4	18.3	18.7
LnGrp LOS	B	A	A	A	B	B
Approach Vol, veh/h	642			583	76	
Approach Delay, s/veh	12.5			5.7	18.5	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		12.0	8.2	26.4
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		9.5		3.1	2.6	14.9
Green Ext Time (p_c), s		4.1		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	415	745	0	35	1421
Future Volume (veh/h)	0	415	745	0	35	1421
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	437	784	0	37	1496
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	2	2
Cap, veh/h	281	587	2553	0	596	2764
Arrive On Green	0.00	0.16	1.00	0.00	0.03	0.78
Sat Flow, veh/h	1781	3170	3741	0	1781	3647
Grp Volume(v), veh/h	0	437	784	0	37	1496
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	0	1781	1777
Q Serve(g_s), s	0.0	18.2	0.0	0.0	0.7	22.6
Cycle Q Clear(g_c), s	0.0	18.2	0.0	0.0	0.7	22.6
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	281	587	2553	0	596	2764
V/C Ratio(X)	0.00	0.74	0.31	0.00	0.06	0.54
Avail Cap(c_a), veh/h	706	1343	2553	0	617	2764
HCM Platoon Ratio	1.00	1.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.93	0.00	0.87	0.87
Uniform Delay (d), s/veh	0.0	53.9	0.0	0.0	4.1	6.0
Incr Delay (d2), s/veh	0.0	1.9	0.3	0.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	22.0	0.2	0.0	0.4	12.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	55.8	0.3	0.0	4.2	6.6
LnGrp LOS	A	E	A	A	A	A
Approach Vol, veh/h	437		784			1533
Approach Delay, s/veh	55.8		0.3			6.6
Approach LOS	E		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		113.4		26.6	8.3	105.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		75.5		55.5	5.5	65.5
Max Q Clear Time (g_c+I1), s		24.6		20.2	2.7	2.0
Green Ext Time (p_c), s		18.1		1.9	0.0	6.8

Intersection Summary	
HCM 6th Ctrl Delay	12.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCS7 Roundabouts Report

General Information

Analyst	GOAL Associates
Agency or Co.	FDOT District 4
Date Performed	8/2/2023
Analysis Year	2025
Time Analyzed	PM Peak Period
Project Description	SR 5/US-1 at Aviation Blvd P...

Site Information

Intersection	SR 5/US-1 & Aviation Blvd
E/W Street Name	Aviation Blvd.
N/S Street Name	SR 5/US-1/Federal Hwy
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	Vero Beach

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT		T				TR								LR	
Volume (V), veh/h	127	395	289		0		306	20					0	35		5
Percent Heavy Vehicles, %	3	3	3		3		3	3					3	3		3
Flow Rate (v_{PCE}), pc/h	138	428	313		0		332	22					0	38		5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.5436	4.5436			4.9763						4.9763	
Follow-Up Headway (s)	2.5352	2.5352			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	413	466			354						43	
Entry Volume, veh/h	401	452			344						42	
Circulating Flow (v_c), pc/h	38			566			917			470		
Exiting Flow (v_{ex}), pc/h	351			475			450			0		
Capacity (c_{pce}), pc/h	1372	1372			775						854	
Capacity (c), veh/h	1332	1332			752						830	
v/c Ratio (x)	0.30	0.34			0.46						0.05	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	5.4	5.8			11.0						4.8	
Lane LOS	A	A			B						A	
95% Queue, veh	1.3	1.5			2.4						0.2	
Approach Delay, s/veh	5.6			11.0						4.8		
Approach LOS	A			B						A		
Intersection Delay, s/veh | LOS	7.1						A					

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2045 Build Alternative 8 Intersection LOS Results

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	783	128	281	271	0	0	1397	458	0	1482	516
Future Volume (veh/h)	0	783	128	281	271	0	0	1397	458	0	1482	516
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	824	135	296	285	0	0	1471	482	0	1560	543
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	0	2	2	0	2	2
Cap, veh/h	0	899	401	350	1399	0	0	1815	1712	0	1815	1425
Arrive On Green	0.00	0.26	0.26	0.07	0.26	0.00	0.00	0.51	0.51	0.00	0.51	0.51
Sat Flow, veh/h	0	3589	1560	3401	3589	0	0	3647	2790	0	3647	2790
Grp Volume(v), veh/h	0	824	135	296	285	0	0	1471	482	0	1560	543
Grp Sat Flow(s),veh/h/ln	0	1749	1560	1700	1749	0	0	1777	1395	0	1777	1395
Q Serve(g_s), s	0.0	34.4	10.6	12.9	9.5	0.0	0.0	51.8	12.1	0.0	57.4	17.7
Cycle Q Clear(g_c), s	0.0	34.4	10.6	12.9	9.5	0.0	0.0	51.8	12.1	0.0	57.4	17.7
Prop In Lane	0.00		1.00	1.00		0.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	0	899	401	350	1399	0	0	1815	1712	0	1815	1425
V/C Ratio(X)	0.00	0.92	0.34	0.85	0.20	0.00	0.00	0.81	0.28	0.00	0.86	0.38
Avail Cap(c_a), veh/h	0	942	420	476	1571	0	0	1815	1712	0	1815	1425
HCM Platoon Ratio	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.72	0.72	0.00	0.41	0.41
Uniform Delay (d), s/veh	0.0	54.2	45.3	68.7	36.6	0.0	0.0	30.6	13.5	0.0	32.0	22.3
Incr Delay (d2), s/veh	0.0	13.1	0.5	10.0	0.1	0.0	0.0	3.0	0.3	0.0	2.4	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(95%),veh/ln	0.0	23.5	7.6	10.4	7.7	0.0	0.0	29.3	19.2	0.0	30.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	67.3	45.8	78.7	36.7	0.0	0.0	33.6	13.8	0.0	34.4	22.6
LnGrp LOS	A	E	D	E	D	A	A	C	B	A	C	C
Approach Vol, veh/h		959			581			1953			2103	
Approach Delay, s/veh		64.3			58.1			28.7			31.4	
Approach LOS		E			E			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		83.4		66.6		83.4	21.4	45.1				
Change Period (Y+Rc), s		6.8		6.6		6.8	6.0	6.6				
Max Green Setting (Gmax), s		69.2		67.4		69.2	21.0	40.4				
Max Q Clear Time (g_c+I1), s		59.4		11.5		53.8	14.9	36.4				
Green Ext Time (p_c), s		7.9		2.1		11.0	0.5	2.2				

Intersection Summary												
HCM 6th Ctrl Delay			38.9									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Future Volume (veh/h)	218	38	88	20	33	31	115	1517	22	21	1676	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	0	93	21	35	33	121	1597	23	22	1764	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	324	0	144	30	51	70	187	2644	38	212	2293	96
Arrive On Green	0.06	0.00	0.06	0.04	0.04	0.04	0.03	0.74	0.74	0.66	0.66	0.66
Sat Flow, veh/h	3506	0	1560	678	1129	1560	1781	3586	52	312	3476	145
Grp Volume(v), veh/h	258	0	93	56	0	33	121	790	830	22	897	941
Grp Sat Flow(s),veh/h/ln	1753	0	1560	1807	0	1560	1781	1777	1861	312	1777	1844
Q Serve(g_s), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	5.4	52.0	53.2
Cycle Q Clear(g_c), s	10.9	0.0	8.7	4.6	0.0	3.1	3.2	31.6	31.7	25.5	52.0	53.2
Prop In Lane	1.00		1.00	0.37		1.00	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	324	0	144	81	0	70	187	1310	1372	212	1172	1217
V/C Ratio(X)	0.80	0.00	0.65	0.69	0.00	0.47	0.65	0.60	0.60	0.10	0.76	0.77
Avail Cap(c_a), veh/h	584	0	260	373	0	322	215	1310	1372	212	1172	1217
HCM Platoon Ratio	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	69.0	0.0	68.0	70.6	0.0	69.9	26.3	9.3	9.3	18.1	17.5	17.7
Incr Delay (d2), s/veh	4.5	0.0	4.8	9.9	0.0	4.8	5.4	2.1	2.0	0.4	2.1	2.1
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(95%),veh/ln	9.0	0.0	6.8	4.2	0.0	2.4	5.7	18.0	18.7	0.8	26.1	27.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	0.0	72.8	80.5	0.0	74.7	31.6	11.4	11.3	18.6	19.6	19.9
LnGrp LOS	E	A	E	F	A	E	C	B	B	B	B	B
Approach Vol, veh/h		351			89			1741			1860	
Approach Delay, s/veh		73.3			78.3			12.8			19.7	
Approach LOS		E			E			B			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.6	105.8		12.7		117.4		19.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	61.2		31.0		75.2		25.0				
Max Q Clear Time (g_c+I1), s	5.2	55.2		6.6		33.7		12.9				
Green Ext Time (p_c), s	0.1	5.2		0.3		18.0		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		22.7	
HCM 6th LOS		C	

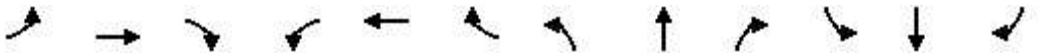
Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	98	102	1716	279	289	1892
Future Volume (veh/h)	98	102	1716	279	289	1892
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	107	1806	294	304	1992
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	250	338	2010	318	328	2975
Arrive On Green	0.07	0.07	0.65	0.65	0.14	0.84
Sat Flow, veh/h	3401	1560	3166	487	1781	3647
Grp Volume(v), veh/h	103	107	1023	1077	304	1992
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1783	1781	1777
Q Serve(g_s), s	4.3	8.7	70.4	79.2	19.1	31.1
Cycle Q Clear(g_c), s	4.3	8.7	70.4	79.2	19.1	31.1
Prop In Lane	1.00	1.00		0.27	1.00	
Lane Grp Cap(c), veh/h	250	338	1162	1166	328	2975
V/C Ratio(X)	0.41	0.32	0.88	0.92	0.93	0.67
Avail Cap(c_a), veh/h	395	404	1162	1166	381	2975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.67	0.67	1.00	1.00
Uniform Delay (d), s/veh	66.4	49.4	21.2	22.7	53.4	4.5
Incr Delay (d2), s/veh	1.1	0.5	6.8	9.8	26.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	12.6	37.4	42.5	19.9	14.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.5	49.9	28.0	32.4	79.8	5.7
LnGrp LOS	E	D	C	C	E	A
Approach Vol, veh/h	210		2100			2296
Approach Delay, s/veh	58.6		30.2			15.5
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		132.4		17.6	27.5	104.9
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		119.2		17.4	26.0	87.2
Max Q Clear Time (g_c+I1), s		33.1		10.7	21.1	81.2
Green Ext Time (p_c), s		37.8		0.4	0.4	5.5

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Future Volume (veh/h)	0	501	306	208	474	3	287	0	314	0	0	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	527	0	219	499	3	302	0	331	0	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	770		380	1037	6	339	0	0	0	0	24
Arrive On Green	0.00	0.42	0.00	0.07	0.57	0.57	0.19	0.00	0.00	0.00	0.00	0.02
Sat Flow, veh/h	0	1841	0	1753	1828	11	1753	302		0	0	1560
Grp Volume(v), veh/h	0	527	0	219	0	502	302	54.3		0	0	6
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1839	1753	D		0	0	1560
Q Serve(g_s), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	18.8	0.0	5.5	0.0	13.1	13.5			0.0	0.0	0.3
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	770		380	0	1043	339			0	0	24
V/C Ratio(X)	0.00	0.68		0.58	0.00	0.48	0.89			0.00	0.00	0.25
Avail Cap(c_a), veh/h	0	770		380	0	1043	355			0	0	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.1	0.0	14.3	0.0	10.4	31.6			0.0	0.0	39.2
Incr Delay (d2), s/veh	0.0	4.9	0.0	2.2	0.0	1.6	22.6			0.0	0.0	5.2
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
%ile BackOfQ(95%),veh/ln	0.0	13.3	0.0	3.9	0.0	8.9	12.2			0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.0	0.0	16.5	0.0	12.0	54.3			0.0	0.0	44.3
LnGrp LOS	A	C		B	A	B	D			A	A	D
Approach Vol, veh/h		527	A		721						6	
Approach Delay, s/veh		24.0			13.3						44.3	
Approach LOS		C			B						D	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		51.7	21.6	7.3	12.0	39.7						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		45.7	16.3	10.0	6.0	33.7						
Max Q Clear Time (g_c+I1), s		15.1	15.5	2.3	7.5	20.8						
Green Ext Time (p_c), s		3.5	0.1	0.0	0.0	2.8						

Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	775	70	132	690	17	24
Future Volume (veh/h)	775	70	132	690	17	24
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	74	139	726	18	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	827	343	1289	171	153
Arrive On Green	0.53	0.53	0.07	0.70	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	816	74	139	726	18	25
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	23.0	1.4	1.9	12.0	0.6	0.9
Cycle Q Clear(g_c), s	23.0	1.4	1.9	12.0	0.6	0.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	827	343	1289	171	153
V/C Ratio(X)	0.84	0.09	0.41	0.56	0.11	0.16
Avail Cap(c_a), veh/h	1758	1489	416	2147	171	153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	7.1	11.0	4.6	25.2	25.4
Incr Delay (d2), s/veh	2.0	0.0	0.8	0.4	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.7	0.7	1.4	5.1	0.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	7.2	11.7	4.9	25.5	25.9
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	890			865	43	
Approach Delay, s/veh	13.6			6.0	25.7	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		49.4		12.0	10.4	38.9
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		71.6		6.0	7.1	58.6
Max Q Clear Time (g_c+I1), s		14.0		2.9	3.9	25.0
Green Ext Time (p_c), s		6.4		0.0	0.1	7.6

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	729	1397	0	66	1998
Future Volume (veh/h)	0	729	1397	0	66	1998
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	767	1471	0	69	2103
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	2	2
Cap, veh/h	404	818	2210	0	232	2464
Arrive On Green	0.00	0.23	0.62	0.00	0.03	0.69
Sat Flow, veh/h	1781	3170	3741	0	1781	3647
Grp Volume(v), veh/h	0	767	1471	0	69	2103
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	0	1781	1777
Q Serve(g_s), s	0.0	34.0	40.1	0.0	2.0	66.7
Cycle Q Clear(g_c), s	0.0	34.0	40.1	0.0	2.0	66.7
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	404	818	2210	0	232	2464
V/C Ratio(X)	0.00	0.94	0.67	0.00	0.30	0.85
Avail Cap(c_a), veh/h	404	818	2210	0	247	2464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.39	0.00	0.71	0.71
Uniform Delay (d), s/veh	0.0	54.5	18.3	0.0	16.0	17.3
Incr Delay (d2), s/veh	0.0	18.1	0.6	0.0	0.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	38.8	20.5	0.0	1.5	33.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	72.5	18.9	0.0	16.5	20.2
LnGrp LOS	A	E	B	A	B	C
Approach Vol, veh/h	767		1471			2172
Approach Delay, s/veh	72.5		18.9			20.1
Approach LOS	E		B			C

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		110.0		40.0	10.7	99.3
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		104.0		34.0	6.0	92.0
Max Q Clear Time (g_c+I1), s		68.7		36.0	4.0	42.1
Green Ext Time (p_c), s		25.2		0.0	0.0	17.5

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCS7 Roundabouts Report

General Information

Analyst	GOAL Associates
Agency or Co.	FDOT District 4
Date Performed	8/2/2023
Analysis Year	2045
Time Analyzed	AM Peak Period
Project Description	SR 5/US-1 at Aviation Blvd P...

Site Information

Intersection	SR 5/US-1 & Aviation Blvd
E/W Street Name	Aviation Blvd.
N/S Street Name	SR 5/US-1/Federal Hwy
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	Vero Beach

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT		T				TR								LR	
Volume (V), veh/h	192	702	347		0		360	27					0	66		5
Percent Heavy Vehicles, %	3	3	3		3		3	3					3	3		3
Flow Rate (v_{PCE}), pc/h	208	761	376		0		390	29					0	72		5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.5436	4.5436			4.9763						4.9763	
Follow-Up Headway (s)	2.5352	2.5352			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	632	713			419						77	
Entry Volume, veh/h	614	692			407						75	
Circulating Flow (v_c), pc/h	72			969			1417			598		
Exiting Flow (v_{ex}), pc/h	448			603			790			0		
Capacity (c_{pce}), pc/h	1330	1330			514						750	
Capacity (c), veh/h	1291	1291			499						728	
v/c Ratio (x)	0.48	0.54			0.82						0.10	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.7	8.6			35.9						6.0	
Lane LOS	A	A			E						A	
95% Queue, veh	2.6	3.3			7.9						0.3	
Approach Delay, s/veh	8.2			35.9						6.0		
Approach LOS	A			E						A		
Intersection Delay, s/veh | LOS	14.4						B					

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	620	267	288	328	0	0	1106	471	0	1448	566
Future Volume (veh/h)	0	620	267	288	328	0	0	1106	471	0	1448	566
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	653	281	303	345	0	0	1164	496	0	1524	596
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	0	2	2	0	2	2
Cap, veh/h	0	743	331	354	1257	0	0	1937	1811	0	1937	1520
Arrive On Green	0.00	0.21	0.21	0.10	0.36	0.00	0.00	0.54	0.54	0.00	0.54	0.54
Sat Flow, veh/h	0	3589	1560	3401	3589	0	0	3647	2790	0	3647	2790
Grp Volume(v), veh/h	0	653	281	303	345	0	0	1164	496	0	1524	596
Grp Sat Flow(s),veh/h/ln	0	1749	1560	1700	1749	0	0	1777	1395	0	1777	1395
Q Serve(g_s), s	0.0	25.3	24.2	12.3	9.8	0.0	0.0	31.0	10.6	0.0	47.8	17.3
Cycle Q Clear(g_c), s	0.0	25.3	24.2	12.3	9.8	0.0	0.0	31.0	10.6	0.0	47.8	17.3
Prop In Lane	0.00		1.00	1.00		0.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	0	743	331	354	1257	0	0	1937	1811	0	1937	1520
V/C Ratio(X)	0.00	0.88	0.85	0.86	0.27	0.00	0.00	0.60	0.27	0.00	0.79	0.39
Avail Cap(c_a), veh/h	0	809	361	413	1384	0	0	1937	1811	0	1937	1520
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)	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.78	0.78	0.00	0.53	0.53
Uniform Delay (d), s/veh	0.0	53.4	53.0	61.7	31.9	0.0	0.0	21.6	10.5	0.0	25.4	18.4
Incr Delay (d2), s/veh	0.0	10.3	16.0	14.4	0.1	0.0	0.0	1.1	0.3	0.0	1.8	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(95%),veh/ln	0.0	17.9	16.4	10.1	7.6	0.0	0.0	18.4	18.3	0.0	25.6	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	63.7	69.0	76.1	32.0	0.0	0.0	22.6	10.8	0.0	27.2	18.8
LnGrp LOS	A	E	E	E	C	A	A	C	B	A	C	B
Approach Vol, veh/h		934			648			1660			2120	
Approach Delay, s/veh		65.3			52.6			19.1			24.8	
Approach LOS		E			D			B			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		83.1		56.9		83.1	20.6	36.3				
Change Period (Y+Rc), s		6.8		6.6		6.8	6.0	6.6				
Max Green Setting (Gmax), s		71.2		55.4		71.2	17.0	32.4				
Max Q Clear Time (g_c+I1), s		49.8		11.8		33.0	14.3	27.3				
Green Ext Time (p_c), s		14.9		2.5		14.9	0.3	2.4				

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Future Volume (veh/h)	123	42	169	39	26	10	109	1398	37	13	1677	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	103	178	41	27	11	115	1472	39	14	1765	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4	2	2	2	2	2	2
Cap, veh/h	233	245	207	55	36	80	165	2442	65	210	2125	87
Arrive On Green	0.13	0.13	0.13	0.02	0.02	0.02	0.04	0.69	0.69	0.61	0.61	0.61
Sat Flow, veh/h	1753	1841	1560	1077	709	1560	1781	3537	94	346	3478	143
Grp Volume(v), veh/h	86	103	178	68	0	11	115	739	772	14	897	941
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1787	0	1560	1781	1777	1854	346	1777	1845
Q Serve(g_s), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	3.4	59.5	60.8
Cycle Q Clear(g_c), s	6.7	7.7	16.8	5.7	0.0	1.0	3.5	33.0	33.2	24.6	59.5	60.8
Prop In Lane	1.00		1.00	0.60		1.00	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	233	245	207	92	0	80	165	1227	1280	210	1086	1127
V/C Ratio(X)	0.37	0.42	0.86	0.74	0.00	0.14	0.70	0.60	0.60	0.07	0.83	0.84
Avail Cap(c_a), veh/h	374	393	333	381	0	333	190	1227	1280	210	1086	1127
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	1.00	0.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	59.3	59.7	63.7	72.7	0.0	70.4	31.5	12.3	12.3	22.0	22.9	23.2
Incr Delay (d2), s/veh	1.0	1.2	12.0	11.0	0.0	0.8	8.9	2.2	2.1	0.3	3.8	3.8
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(95%),veh/ln	5.5	6.7	11.8	5.3	0.0	0.8	5.5	19.4	20.2	0.5	31.1	32.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	60.9	75.7	83.7	0.0	71.2	40.4	14.5	14.4	22.3	26.7	27.0
LnGrp LOS	E	E	E	F	A	E	D	B	B	C	C	C
Approach Vol, veh/h		367			79			1626			1852	
Approach Delay, s/veh		67.9			82.0			16.3			26.8	
Approach LOS		E			F			B			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.9	98.4		13.7		110.4		25.9				
Change Period (Y+Rc), s	6.4	6.8		6.0		6.8		6.0				
Max Green Setting (Gmax), s	7.6	53.2		32.0		67.2		32.0				
Max Q Clear Time (g_c+I1), s	5.5	62.8		7.7		35.2		18.8				
Green Ext Time (p_c), s	0.0	0.0		0.3		14.4		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			27.4									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	302	287	1701	54	67	1775
Future Volume (veh/h)	302	287	1701	54	67	1775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1841	1870	1870	1870	1870
Adj Flow Rate, veh/h	318	302	1791	57	71	1868
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	2	2	2	2
Cap, veh/h	667	355	2261	72	172	2540
Arrive On Green	0.20	0.20	0.64	0.64	0.03	0.71
Sat Flow, veh/h	3401	1560	3609	111	1781	3647
Grp Volume(v), veh/h	318	302	901	947	71	1868
Grp Sat Flow(s),veh/h/ln	1700	1560	1777	1850	1781	1777
Q Serve(g_s), s	12.4	27.8	55.1	56.1	1.9	47.4
Cycle Q Clear(g_c), s	12.4	27.8	55.1	56.1	1.9	47.4
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	667	355	1143	1190	172	2540
V/C Ratio(X)	0.48	0.85	0.79	0.80	0.41	0.74
Avail Cap(c_a), veh/h	667	355	1143	1190	341	2540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	53.5	55.5	19.4	19.6	23.3	12.9
Incr Delay (d2), s/veh	0.5	17.5	4.7	4.7	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.2	32.1	30.7	32.3	2.5	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.0	73.0	24.1	24.3	24.9	14.8
LnGrp LOS	D	E	C	C	C	B
Approach Vol, veh/h	620		1848			1939
Approach Delay, s/veh	63.3		24.2			15.2
Approach LOS	E		C			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		114.0		36.0	10.7	103.3
Change Period (Y+Rc), s		6.8		6.6	6.0	6.8
Max Green Setting (Gmax), s		107.2		29.4	19.0	82.2
Max Q Clear Time (g_c+I1), s		49.4		29.8	3.9	58.1
Green Ext Time (p_c), s		28.3		0.0	0.1	16.2

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Future Volume (veh/h)	0	590	319	324	444	6	232	0	244	0	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1841	1841	1841	1841	1841	1841	0	1841	0	1841	1841
Adj Flow Rate, veh/h	0	621	0	341	467	6	244	0	257	0	0	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	4	4	4	4	4	4	0	4	0	4	4
Cap, veh/h	0	866		420	1151	15	275	0	0	0	0	103
Arrive On Green	0.00	0.47	0.00	0.12	0.63	0.63	0.16	0.00	0.00	0.00	0.00	0.07
Sat Flow, veh/h	0	1841	0	1753	1813	23	1753	244		0	0	1560
Grp Volume(v), veh/h	0	621	0	341	0	473	244	64.3		0	0	51
Grp Sat Flow(s),veh/h/ln	0	1841	0	1753	0	1837	1753	E		0	0	1560
Q Serve(g_s), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Cycle Q Clear(g_c), s	0.0	34.0	0.0	12.1	0.0	16.0	17.2			0.0	0.0	4.0
Prop In Lane	0.00		0.00	1.00		0.01	1.00			0.00		1.00
Lane Grp Cap(c), veh/h	0	866		420	0	1165	275			0	0	103
V/C Ratio(X)	0.00	0.72		0.81	0.00	0.41	0.89			0.00	0.00	0.50
Avail Cap(c_a), veh/h	0	866		494	0	1165	445			0	0	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	0.00	1.00	1.00			0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.7	0.0	21.4	0.0	11.3	52.1			0.0	0.0	56.8
Incr Delay (d2), s/veh	0.0	5.1	0.0	8.6	0.0	1.1	12.2			0.0	0.0	3.6
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
%ile BackOfQ(95%),veh/ln	0.0	22.4	0.0	9.6	0.0	10.9	13.3			0.0	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	31.7	0.0	30.0	0.0	12.4	64.3			0.0	0.0	60.5
LnGrp LOS	A	C		C	A	B	E			A	A	E
Approach Vol, veh/h		621	A		814						51	
Approach Delay, s/veh		31.7			19.8						60.5	
Approach LOS		C			B						E	

Timer - Assigned Phs		2	3	4	5	6						
Phs Duration (G+Y+Rc), s		86.0	25.8	14.3	20.7	65.3						
Change Period (Y+Rc), s		6.0	6.0	6.0	6.0	6.0						
Max Green Setting (Gmax), s		80.0	32.0	10.0	20.0	54.0						
Max Q Clear Time (g_c+I1), s		18.0	19.2	6.0	14.1	36.0						
Green Ext Time (p_c), s		3.5	0.6	0.1	0.6	4.0						

Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	766	55	66	759	44	54
Future Volume (veh/h)	766	55	66	759	44	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	806	58	69	799	46	57
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	968	820	323	1260	180	160
Arrive On Green	0.53	0.53	0.06	0.68	0.10	0.10
Sat Flow, veh/h	1841	1560	1753	1841	1753	1560
Grp Volume(v), veh/h	806	58	69	799	46	57
Grp Sat Flow(s),veh/h/ln	1841	1560	1753	1841	1753	1560
Q Serve(g_s), s	21.6	1.1	0.9	14.1	1.4	2.0
Cycle Q Clear(g_c), s	21.6	1.1	0.9	14.1	1.4	2.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	968	820	323	1260	180	160
V/C Ratio(X)	0.83	0.07	0.21	0.63	0.26	0.36
Avail Cap(c_a), veh/h	1660	1407	435	2070	361	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	6.8	9.8	5.1	24.1	24.4
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.5	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.9	0.5	0.6	6.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	6.9	10.1	5.7	24.8	25.7
LnGrp LOS	B	A	B	A	C	C
Approach Vol, veh/h	864			868	103	
Approach Delay, s/veh	13.2			6.0	25.3	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.3		12.0	9.3	37.1
Change Period (Y+Rc), s		6.4		6.0	5.9	6.4
Max Green Setting (Gmax), s		65.6		12.0	7.1	52.6
Max Q Clear Time (g_c+I1), s		16.1		4.0	2.9	23.6
Green Ext Time (p_c), s		7.4		0.1	0.0	7.1

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	568	1106	0	85	2014
Future Volume (veh/h)	0	568	1106	0	85	2014
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	598	1164	0	89	2120
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	0	2	2
Cap, veh/h	375	777	2340	0	431	2577
Arrive On Green	0.00	0.14	1.00	0.00	0.03	0.73
Sat Flow, veh/h	1781	3170	3741	0	1781	3647
Grp Volume(v), veh/h	0	598	1164	0	89	2120
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	0	1781	1777
Q Serve(g_s), s	0.0	24.8	0.0	0.0	2.2	56.9
Cycle Q Clear(g_c), s	0.0	24.8	0.0	0.0	2.2	56.9
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	375	777	2340	0	431	2577
V/C Ratio(X)	0.00	0.77	0.50	0.00	0.21	0.82
Avail Cap(c_a), veh/h	706	1366	2340	0	439	2577
HCM Platoon Ratio	0.33	0.66	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.74	0.00	0.67	0.67
Uniform Delay (d), s/veh	0.0	53.7	0.0	0.0	6.3	13.1
Incr Delay (d2), s/veh	0.0	1.6	0.6	0.0	0.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	28.9	0.3	0.0	1.5	27.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	55.4	0.6	0.0	6.5	15.2
LnGrp LOS	A	E	A	A	A	B
Approach Vol, veh/h	598		1164			2209
Approach Delay, s/veh	55.4		0.6			14.9
Approach LOS	E		A			B

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		106.0		34.0	9.3	96.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		75.5		55.5	5.5	65.5
Max Q Clear Time (g_c+I1), s		58.9		26.8	4.2	2.0
Green Ext Time (p_c), s		13.9		2.6	0.0	12.2

Intersection Summary	
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCS7 Roundabouts Report

General Information

Analyst	GOAL Associates
Agency or Co.	FDOT District 4
Date Performed	8/2/2023
Analysis Year	2045
Time Analyzed	PM Peak Period
Project Description	SR 5/US-1 at Aviation Blvd P...

Site Information

Intersection	SR 5/US-1 & Aviation Blvd
E/W Street Name	Aviation Blvd.
N/S Street Name	SR 5/US-1/Federal Hwy
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	Vero Beach

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
Lane Assignment	LT		T				TR								LR	
Volume (V), veh/h	177	523	391		0		439	45					0	85		5
Percent Heavy Vehicles, %	3	3	3		3		3	3					3	3		3
Flow Rate (v_{PCE}), pc/h	192	567	424		0		476	49					0	92		5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1								1			
Pedestrians Crossing, p/h	0				0								0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)	4.5436	4.5436			4.9763						4.9763	
Follow-Up Headway (s)	2.5352	2.5352			2.6087						2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h	556	627			525						97	
Entry Volume, veh/h	540	609			510						94	
Circulating Flow (v_c), pc/h	92			759			1275			668		
Exiting Flow (v_{ex}), pc/h	516			673			616			0		
Capacity (c_{pce}), pc/h	1306	1306			636						698	
Capacity (c), veh/h	1268	1268			618						678	
v/c Ratio (x)	0.43	0.48			0.83						0.14	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	7.1	7.8			31.5						6.9	
Lane LOS	A	A			D						A	
95% Queue, veh	2.2	2.7			8.6						0.5	
Approach Delay, s/veh	7.5			31.5						6.9		
Approach LOS	A			D						A		
Intersection Delay, s/veh | LOS	14.4						B					

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APPENDIX N

(HSM Safety Analysis Results)

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Roadway Section	From 26th Street to 37th Street
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2025

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, 5T)		--	4U
Length of segment, L (mi)		--	0.423
AADT (veh/day)	$AADT_{MAX}$ = 40,100 (veh/day)	--	30,800
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	
Median width (ft.) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	10
Minor commercial driveways (number)		--	
Major industrial / institutional driveways (number)		--	
Minor industrial / institutional driveways (number)		--	
Major residential driveways (number)		--	
Minor residential driveways (number)		--	
Other driveways (number)		--	
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	
Offset to roadside fixed objects (ft.) [If greater than 30 or Not Present, input 30]		30	20
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	0.92	1.00	0.92

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-11.63	1.33	1.01	3.510	1.000	3.510	0.92	1.00	3.219
Fatal and Injury (FI)	-12.08	1.25	0.99	0.979	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.290	1.019	0.92	1.00	0.935
Property Damage Only (PDO)	-12.53	1.38	1.08	2.392	$(5)_{TOTAL}-(5)_{FI}$ = 0.710	2.491	0.92	1.00	2.284

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.935	1.000	2.284	3.219
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.511	0.478	0.506	1.156	1.634
Head-on collision	0.077	0.072	0.004	0.009	0.081
Angle collision	0.181	0.169	0.130	0.297	0.466
Sideswipe, same direction	0.093	0.087	0.249	0.569	0.656
Sideswipe, opposite direction	0.082	0.077	0.031	0.071	0.147
Other multiple-vehicle collision	0.056	0.052	0.080	0.183	0.235

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-7.99	0.81	0.91	0.620	1.000	0.620	0.92	1.00	0.568
Fatal and Injury (FI)	-7.37	0.61	0.54	0.146	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.223	0.138	0.92	1.00	0.127
Property Damage Only (PDO)	-8.50	0.84	0.97	0.507	$(5)_{TOTAL}-(5)_{FI}$ = 0.777	0.481	0.92	1.00	0.441

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.127	1.000	0.441	0.568
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.001	0.000	0.001
Collision with fixed object	0.612	0.078	0.809	0.357	0.435
Collision with other object	0.020	0.003	0.029	0.013	0.015
Other single-vehicle collision	0.367	0.047	0.161	0.071	0.118

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	10	0.182	1.172	4.229	
Minor commercial	0	0.058	1.172	0.000	
Major industrial/institutional	0	0.198	1.172	0.000	
Minor industrial/institutional	0	0.026	1.172	0.000	--
Major residential	0	0.096	1.172	0.000	
Minor residential	0	0.018	1.172	0.000	
Other	0	0.029	1.172	0.000	
Total	--	--	--	4.229	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	4.229	1.000	4.229	0.92	1.00	3.879
Fatal and injury (FI)	--	0.342	1.446	0.92	1.00	1.327
Property damage only (PDO)	--	0.658	2.783	0.92	1.00	2.552

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)
Total	3.219	0.568	3.879	7.666	0.009	1.00	0.069
Fatal and injury (FI)	--	--	--	--	--	1.00	0.069

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)
Total	3.219	0.568	3.879	7.666	0.002	1.00	0.015
Fatal and injury (FI)	--	--	--	--	--	1.00	0.015

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.478	1.156	1.634
Head-on collisions (from Worksheet 1D)	0.072	0.009	0.081
Angle collisions (from Worksheet 1D)	0.169	0.297	0.466
Sideswipe, same direction (from Worksheet 1D)	0.087	0.569	0.656
Sideswipe, opposite direction (from Worksheet 1D)	0.077	0.071	0.147
Driveway-related collisions (from Worksheet 1H)	1.327	2.552	3.879
Other multiple-vehicle collision (from Worksheet 1D)	0.052	0.183	0.235
Subtotal	2.261	4.837	7.098
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 1F)	0.078	0.357	0.435
Collision with other object (from Worksheet 1F)	0.003	0.013	0.015
Other single-vehicle collision (from Worksheet 1F)	0.047	0.071	0.118
Collision with pedestrian (from Worksheet 1I)	0.069	0.000	0.069
Collision with bicycle (from Worksheet 1J)	0.015	0.000	0.015
Subtotal	0.211	0.441	0.653
Total	2.473	5.278	7.751

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)** (Total) from Worksheet 1K	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)** (2) / (3)
Total	7.8	0.42	18.3
Fatal and injury (FI)	2.5	0.42	5.8
Property damage only (PDO)	5.3	0.42	12.5

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Francisco Morales	Roadway	Aviation Blvd
Agency or Company	GOAL Associates Inc.	Roadway Section	From 27th Avenue to SR 5/US-1
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2025

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	2U
Length of segment, L (mi)		--	0.89
AADT (veh/day)	$AADT_{MAX}$ = 32,600 (veh/day)	--	13,600
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Not Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	2
Minor commercial driveways (number)		--	
Major industrial / institutional driveways (number)		--	
Minor industrial / institutional driveways (number)		--	
Major residential driveways (number)		--	
Minor residential driveways (number)		--	
Other driveways (number)		--	
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-15.22	1.68	0.84	1.922	1.000	1.922	1.00	1.00	1.922
Fatal and Injury (FI)	-16.22	1.66	0.65	0.585	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.292	0.561	1.00	1.00	0.561
Property Damage Only (PDO)	-15.62	1.69	0.87	1.417	$(5)_{TOTAL}-(5)_{FI}$ = 0.708	1.361	1.00	1.00	1.361

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.561	1.000	1.361	1.922
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.730	0.410	0.778	1.059	1.468
Head-on collision	0.068	0.038	0.004	0.005	0.044
Angle collision	0.085	0.048	0.079	0.108	0.155
Sideswipe, same direction	0.015	0.008	0.031	0.042	0.051
Sideswipe, opposite direction	0.073	0.041	0.055	0.075	0.116
Other multiple-vehicle collision	0.029	0.016	0.053	0.072	0.088

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.47	0.56	0.81	0.774	1.000	0.774	1.00	1.00	0.774
Fatal and Injury (FI)	-3.96	0.23	0.50	0.151	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.205	0.159	1.00	1.00	0.159
Property Damage Only (PDO)	-6.51	0.64	0.87	0.586	$(5)_{TOTAL}-(5)_{FI}$ = 0.795	0.615	1.00	1.00	0.615

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.159	1.000	0.615	0.774
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.026	0.004	0.066	0.041	0.045
Collision with fixed object	0.723	0.115	0.759	0.467	0.582
Collision with other object	0.010	0.002	0.013	0.008	0.010
Other single-vehicle collision	0.241	0.038	0.162	0.100	0.138

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.158	1.000	0.287	
Minor commercial	0	0.050	1.000	0.000	
Major industrial/institutional	0	0.172	1.000	0.000	
Minor industrial/institutional	0	0.023	1.000	0.000	--
Major residential	0	0.083	1.000	0.000	
Minor residential	0	0.016	1.000	0.000	
Other	0	0.025	1.000	0.000	
Total	--	--	--	0.287	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.287	1.000	0.287	1.00	1.00	0.287
Fatal and injury (FI)	--	0.323	0.093	1.00	1.00	0.093
Property damage only (PDO)	--	0.677	0.194	1.00	1.00	0.194

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	1.922	0.774	0.287	2.982	0.036	1.00	0.107
Fatal and injury (FI)	--	--	--	--	--	1.00	0.107

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	1.922	0.774	0.287	2.982	0.018	1.00	0.054
Fatal and injury (FI)	--	--	--	--	--	1.00	0.054

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.410	1.059	1.468
Head-on collisions (from Worksheet 1D)	0.038	0.005	0.044
Angle collisions (from Worksheet 1D)	0.048	0.108	0.155
Sideswipe, same direction (from Worksheet 1D)	0.008	0.042	0.051
Sideswipe, opposite direction (from Worksheet 1D)	0.041	0.075	0.116
Driveway-related collisions (from Worksheet 1H)	0.093	0.194	0.287
Other multiple-vehicle collision (from Worksheet 1D)	0.016	0.072	0.088
Subtotal	0.654	1.555	2.209
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.004	0.041	0.045
Collision with fixed object (from Worksheet 1F)	0.115	0.467	0.582
Collision with other object (from Worksheet 1F)	0.002	0.008	0.010
Other single-vehicle collision (from Worksheet 1F)	0.038	0.100	0.138
Collision with pedestrian (from Worksheet 1I)	0.107	0.000	0.107
Collision with bicycle (from Worksheet 1J)	0.054	0.000	0.054
Subtotal	0.320	0.615	0.935
Total	0.974	2.169	3.143

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	3.1	0.89	3.5
Fatal and injury (FI)	1.0	0.89	1.1
Property damage only (PDO)	2.2	0.89	2.4

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Intersection	SR 5/US-1 and Aviation Blvd.
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2025

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	30,800
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	13,600
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	
Number of major-road approaches with right-turn lanes (0,1,2)		0	
Data for signalized intersections only:		--	
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	3
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			5
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	1
Schools within 300 m (1,000 ft.) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft.) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	0.91	1.00	1.00	0.91	1.00	0.61

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	9.562	1.000	9.562	0.61	1.00	5.798
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	3.157	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.341	3.265	0.61	1.00	1.980
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	6.088	$(5)_{TOTAL}-(5)_{FI}$ = 0.659	6.297	0.61	1.00	3.818

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.980	1.000	3.818	5.798
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.891	0.483	1.844	2.735
Head-on collision	0.049	0.097	0.030	0.115	0.212
Angle collision	0.347	0.687	0.244	0.932	1.619
Sideswipe	0.099	0.196	0.032	0.122	0.318
Other multiple-vehicle collision	0.055	0.109	0.211	0.806	0.915

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.542	1.000	0.542	0.61	1.00	0.329
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.129	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.241	0.131	0.61	1.00	0.079
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.407	$(5)_{TOTAL}-(5)_{FI}$ = 0.759	0.411	0.61	1.00	0.249

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.079	1.000	0.249	0.329
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.059	0.870	0.217	0.276
Collision with other object	0.072	0.006	0.070	0.017	0.023
Other single-vehicle collision	0.040	0.003	0.023	0.006	0.009
Single-vehicle noncollision	0.141	0.011	0.034	0.008	0.020

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.011	3.11	1.00	0.033
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.033

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	5.798	0.329	6.127	0.015	1.00	0.092
Fatal and injury (FI)	--	--	--	--	1.00	0.092

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.891	1.844	2.735
Head-on collisions (from Worksheet 2D)	0.097	0.115	0.212
Angle collisions (from Worksheet 2D)	0.687	0.932	1.619
Sideswipe (from Worksheet 2D)	0.196	0.122	0.318
Other multiple-vehicle collision (from Worksheet 2D)	0.109	0.806	0.915
Subtotal	1.980	3.818	5.798
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.059	0.217	0.276
Collision with other object (from Worksheet 2F)	0.006	0.017	0.023
Other single-vehicle collision (from Worksheet 2F)	0.003	0.006	0.009
Single-vehicle noncollision (from Worksheet 2F)	0.011	0.008	0.020
Collision with pedestrian (from Worksheet 2G or 2I)	0.033	0.000	0.033
Collision with bicycle (from Worksheet 2J)	0.092	0.000	0.092
Subtotal	0.204	0.249	0.454
Total	2.184	4.068	6.252

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.3
Fatal and injury (FI)	2.2
Property damage only (PDO)	4.1

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Intersection	SR 5/US-1 and 26th Street
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2025

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	25,900
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	3,400
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	
Number of major-road approaches with right-turn lanes (0,1,2)		0	
Data for signalized intersections only:		--	
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	1
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			5
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	2
Schools within 300 m (1,000 ft.) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft.) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	0.92	0.96	1.00	0.91	1.00	0.59

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	5.775	1.000	5.775	0.59	1.00	3.396
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	1.897	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.341	1.972	0.59	1.00	1.160
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	3.658	$(5)_{TOTAL}-(5)_{FI}$ = 0.659	3.803	0.59	1.00	2.236

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	1.160	1.000	2.236	3.396
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.522	0.483	1.080	1.602
Head-on collision	0.049	0.057	0.030	0.067	0.124
Angle collision	0.347	0.402	0.244	0.546	0.948
Sideswipe	0.099	0.115	0.032	0.072	0.186
Other multiple-vehicle collision	0.055	0.064	0.211	0.472	0.536

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.331	1.000	0.331	0.59	1.00	0.195
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.080	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.242	0.080	0.59	1.00	0.047
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.251	$(5)_{TOTAL}-(5)_{FI}$ = 0.758	0.251	0.59	1.00	0.148

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.047	1.000	0.148	0.195
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.000
Collision with fixed object	0.744	0.035	0.870	0.129	0.164
Collision with other object	0.072	0.003	0.070	0.010	0.014
Other single-vehicle collision	0.040	0.002	0.023	0.003	0.005
Single-vehicle noncollision	0.141	0.007	0.034	0.005	0.012

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.007	3.11	1.00	0.021
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.021

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	3.396	0.195	3.591	0.015	1.00	0.054
Fatal and injury (FI)	--	--	--	--	1.00	0.054

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.522	1.080	1.602
Head-on collisions (from Worksheet 2D)	0.057	0.067	0.124
Angle collisions (from Worksheet 2D)	0.402	0.546	0.948
Sideswipe (from Worksheet 2D)	0.115	0.072	0.186
Other multiple-vehicle collision (from Worksheet 2D)	0.064	0.472	0.536
Subtotal	1.160	2.236	3.396
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.035	0.129	0.164
Collision with other object (from Worksheet 2F)	0.003	0.010	0.014
Other single-vehicle collision (from Worksheet 2F)	0.002	0.003	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.007	0.005	0.012
Collision with pedestrian (from Worksheet 2G or 2I)	0.021	0.000	0.021
Collision with bicycle (from Worksheet 2J)	0.054	0.000	0.054
Subtotal	0.122	0.148	0.269
Total	1.281	2.384	3.665

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	3.7
Fatal and injury (FI)	1.3
Property damage only (PDO)	2.4

Worksheet 4A -- Predicted Crashes by Collision and Site Type and Observed Crashes Using the Project-Level EB Method for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Collision type / Site type	**Predicted crashes**			**Observed crashes, $N_{observed}$** (crashes/year)	**Overdispersion Parameter, k**	**$N_{predicted\ w0}$** Equation A-8 $(6)*(2)^2$	**$N_{predicted\ w1}$** Equation A-9 sqrt((6)*(2))	**W_0** Equation A-10	**N_0** Equation A-11	**w_1** Equation A-12	**N_1** Equation A-13	**$N_{expected/comb}$** Equation A-14
	$N_{predicted}$ (TOTAL)	$N_{predicted}$ (FI)	$N_{predicted}$ (PDO)									
ROADWAY SEGMENTS												
Multiple-vehicle nondriveway												
Segment 1	3.219	0.935	2.284	--	1.010	10.466	1.803	--	--	--	--	--
Segment 2	1.922	0.561	1.361	--	0.840	3.103	1.271	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
Single-vehicle												
Segment 1	0.568	0.127	0.441	--	0.910	0.294	0.719	--	--	--	--	--
Segment 2	0.774	0.159	0.615	--	0.810	0.485	0.792	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
Multiple-vehicle driveway-related												
Segment 1	3.879	1.327	2.552	--	0.810	12.189	1.773	--	--	--	--	--
Segment 2	0.287	0.093	0.194	--	0.810	0.066	0.482	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
INTERSECTIONS												
Multiple-vehicle												
Intersection 1	5.798	1.980	3.818	--	0.390	13.112	1.504	--	--	--	--	--
Intersection 2	3.396	1.160	2.236	--	0.390	4.497	1.151	--	--	--	--	--
Intersection 3				--				--	--	--	--	--
Intersection 4				--				--	--	--	--	--
Single-vehicle												
Intersection 1	0.329	0.079	0.249	--	0.360	0.039	0.344	--	--	--	--	--
Intersection 2	0.195	0.047	0.148	--	0.360	0.014	0.265	--	--	--	--	--
Intersection 3				--				--	--	--	--	--
Intersection 4				--				--	--	--	--	--
COMBINED (sum of column)	20.366	6.467	13.899	22	--	44.265	10.102	0.315	21.485	0.668	20.908	21.197

Worksheet 4B -- Predicted Pedestrian and Bicycle Crashes for Urban and Suburban Arterials

(1)	(2)	(3)
Site Type	**N_{ped}**	**N_{bike}**
ROADWAY SEGMENTS		
Segment 1	0.069	0.015
Segment 2	0.107	0.054
Segment 3		
Segment 4		
INTERSECTIONS		
Intersection 1	0.033	0.092
Intersection 2	0.021	0.054
Intersection 3		
Intersection 4		
COMBINED (sum of column)	0.230	0.215

Worksheet 4C -- Project-Specific EB Method Summary Results for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)
Crash severity level	**$N_{predicted}$**	**N_{ped}**	**N_{bike}**	$N_{expected\ (vehicle)}$	$N_{expected}$
Total	$(2)_{COMB}$ from Worksheet 4A	$(2)_{COMB}$ from Worksheet 4B	$(3)_{COMB}$ from Worksheet 4B	$(13)_{COMB}$ Worksheet 4A	(3)+(4)+(5)
	20.4	0.2	0.2	21.2	21.6
Fatal and injury (FI)	$(3)_{COMB}$ from Worksheet 4A	$(2)_{COMB}$ from Worksheet 4B	$(3)_{COMB}$ from Worksheet 4B	$(5)_{TOTAL} * (2)_{FI} / (2)_{TOTAL}$	(3)+(4)+(5)
	6.5	0.2	0.2	6.7	7.2
Property damage only (PDO)	$(4)_{COMB}$ from Worksheet 4A	--	--	$(5)_{TOTAL} * (2)_{PDO} / (2)_{TOTAL}$	(3)+(4)+(5)
	13.9	0.0	0.0	14.5	14.5

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Roadway Section	From 26th Street to 37th Street
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, 5T)		--	4U
Length of segment, L (mi)		--	0.423
AADT (veh/day)	$AADT_{MAX}$ = 40,100 (veh/day)	--	**45,800**
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	
Median width (ft.) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	10
Minor commercial driveways (number)		--	
Major industrial / institutional driveways (number)		--	
Minor industrial / institutional driveways (number)		--	
Major residential driveways (number)		--	
Minor residential driveways (number)		--	
Other driveways (number)		--	
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	
Offset to roadside fixed objects (ft.) [If greater than 30 or Not Present, input 30]		30	20
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	0.92	1.00	0.92

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-11.63	1.33	1.01	5.949	1.000	5.949	0.92	1.00	5.456
Fatal and Injury (FI)	-12.08	1.25	0.99	1.607	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.280	1.665	0.92	1.00	1.527
Property Damage Only (PDO)	-12.53	1.38	1.08	4.136	$(5)_{TOTAL}-(5)_{FI}$ = 0.720	4.284	0.92	1.00	3.929

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	1.527	1.000	3.929	5.456
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.511	0.780	0.506	1.988	2.769
Head-on collision	0.077	0.118	0.004	0.016	0.133
Angle collision	0.181	0.276	0.130	0.511	0.787
Sideswipe, same direction	0.093	0.142	0.249	0.978	1.120
Sideswipe, opposite direction	0.082	0.125	0.031	0.122	0.247
Other multiple-vehicle collision	0.056	0.086	0.080	0.314	0.400

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-7.99	0.81	0.91	0.854	1.000	0.854	0.92	1.00	0.784
Fatal and Injury (FI)	-7.37	0.61	0.54	0.186	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.208	0.178	0.92	1.00	0.163
Property Damage Only (PDO)	-8.50	0.84	0.97	0.708	$(5)_{TOTAL}-(5)_{FI}$ = 0.792	0.677	0.92	1.00	0.621

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.163	1.000	0.621	0.784
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.001	0.001	0.001
Collision with fixed object	0.612	0.100	0.809	0.502	0.602
Collision with other object	0.020	0.003	0.029	0.018	0.021
Other single-vehicle collision	0.367	0.060	0.161	0.100	0.160

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	10	0.182	1.172	6.733	
Minor commercial	0	0.058	1.172	0.000	
Major industrial/institutional	0	0.198	1.172	0.000	
Minor industrial/institutional	0	0.026	1.172	0.000	--
Major residential	0	0.096	1.172	0.000	
Minor residential	0	0.018	1.172	0.000	
Other	0	0.029	1.172	0.000	
Total	--	--	--	6.733	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	6.733	1.000	6.733	0.92	1.00	6.176
Fatal and injury (FI)	--	0.342	2.303	0.92	1.00	2.112
Property damage only (PDO)	--	0.658	4.430	0.92	1.00	4.064

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)
Total	5.456	0.784	6.176	12.416	0.009	1.00	0.112
Fatal and injury (FI)	--	--	--	--	--	1.00	0.112

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)
Total	5.456	0.784	6.176	12.416	0.002	1.00	0.025
Fatal and injury (FI)	--	--	--	--	--	1.00	0.025

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.780	1.988	2.769
Head-on collisions (from Worksheet 1D)	0.118	0.016	0.133
Angle collisions (from Worksheet 1D)	0.276	0.511	0.787
Sideswipe, same direction (from Worksheet 1D)	0.142	0.978	1.120
Sideswipe, opposite direction (from Worksheet 1D)	0.125	0.122	0.247
Driveway-related collisions (from Worksheet 1H)	2.112	4.064	6.176
Other multiple-vehicle collision (from Worksheet 1D)	0.086	0.314	0.400
Subtotal	3.639	7.993	11.632
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 1F)	0.100	0.502	0.602
Collision with other object (from Worksheet 1F)	0.003	0.018	0.021
Other single-vehicle collision (from Worksheet 1F)	0.060	0.100	0.160
Collision with pedestrian (from Worksheet 1I)	0.112	0.000	0.112
Collision with bicycle (from Worksheet 1J)	0.025	0.000	0.025
Subtotal	0.299	0.621	0.920
Total	3.939	8.614	12.552

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	12.6	0.42	29.7
Fatal and injury (FI)	3.9	0.42	9.3
Property damage only (PDO)	8.6	0.42	20.4

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Francisco Morales	Roadway	Aviation Blvd
Agency or Company	GOAL Associates Inc.	Roadway Section	From 27th Avenue to SR 5/US-1
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	2U
Length of segment, L (mi)		--	0.89
AADT (veh/day)	$AADT_{MAX}$ = 32,600 (veh/day)	--	20,400
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Not Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	2
Minor commercial driveways (number)		--	
Major industrial / institutional driveways (number)		--	
Minor industrial / institutional driveways (number)		--	
Major residential driveways (number)		--	
Minor residential driveways (number)		--	
Other driveways (number)		--	
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	1.00	1.00	1.00

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-15.22	1.68	0.84	3.798	1.000	3.798	1.00	1.00	3.798
Fatal and Injury (FI)	-16.22	1.66	0.65	1.146	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.290	1.100	1.00	1.00	1.100
Property Damage Only (PDO)	-15.62	1.69	0.87	2.812	$(5)_{TOTAL}-(5)_{FI}$ = 0.710	2.699	1.00	1.00	2.699

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	1.100	1.000	2.699	3.798
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.730	0.803	0.778	2.100	2.902
Head-on collision	0.068	0.075	0.004	0.011	0.086
Angle collision	0.085	0.093	0.079	0.213	0.307
Sideswipe, same direction	0.015	0.016	0.031	0.084	0.100
Sideswipe, opposite direction	0.073	0.080	0.055	0.148	0.229
Other multiple-vehicle collision	0.029	0.032	0.053	0.143	0.175

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.47	0.56	0.81	0.971	1.000	0.971	1.00	1.00	0.971
Fatal and Injury (FI)	-3.96	0.23	0.50	0.166	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.180	0.174	1.00	1.00	0.174
Property Damage Only (PDO)	-6.51	0.64	0.87	0.759	$(5)_{TOTAL}-(5)_{FI}$ = 0.820	0.796	1.00	1.00	0.796

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.174	1.000	0.796	0.971
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.026	0.005	0.066	0.053	0.057
Collision with fixed object	0.723	0.126	0.759	0.605	0.731
Collision with other object	0.010	0.002	0.013	0.010	0.012
Other single-vehicle collision	0.241	0.042	0.162	0.129	0.171

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.158	1.000	0.430	
Minor commercial	0	0.050	1.000	0.000	
Major industrial/institutional	0	0.172	1.000	0.000	
Minor industrial/institutional	0	0.023	1.000	0.000	--
Major residential	0	0.083	1.000	0.000	
Minor residential	0	0.016	1.000	0.000	
Other	0	0.025	1.000	0.000	
Total	--	--	--	0.430	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.430	1.000	0.430	1.00	1.00	0.430
Fatal and injury (FI)	--	0.323	0.139	1.00	1.00	0.139
Property damage only (PDO)	--	0.677	0.291	1.00	1.00	0.291

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	3.798	0.971	0.430	5.199	0.036	1.00	0.187
Fatal and injury (FI)	--	--	--	--	--	1.00	0.187

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	3.798	0.971	0.430	5.199	0.018	1.00	0.094
Fatal and injury (FI)	--	--	--	--	--	1.00	0.094

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.803	2.100	2.902
Head-on collisions (from Worksheet 1D)	0.075	0.011	0.086
Angle collisions (from Worksheet 1D)	0.093	0.213	0.307
Sideswipe, same direction (from Worksheet 1D)	0.016	0.084	0.100
Sideswipe, opposite direction (from Worksheet 1D)	0.080	0.148	0.229
Driveway-related collisions (from Worksheet 1H)	0.139	0.291	0.430
Other multiple-vehicle collision (from Worksheet 1D)	0.032	0.143	0.175
Subtotal	1.239	2.990	4.228
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.005	0.053	0.057
Collision with fixed object (from Worksheet 1F)	0.126	0.605	0.731
Collision with other object (from Worksheet 1F)	0.002	0.010	0.012
Other single-vehicle collision (from Worksheet 1F)	0.042	0.129	0.171
Collision with pedestrian (from Worksheet 1I)	0.187	0.000	0.187
Collision with bicycle (from Worksheet 1J)	0.094	0.000	0.094
Subtotal	0.455	0.796	1.252
Total	1.694	3.786	5.480

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	5.5	0.89	6.2
Fatal and injury (FI)	1.7	0.89	1.9
Property damage only (PDO)	3.8	0.89	4.3

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Intersection	SR 5/US-1 and Aviation Blvd.
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	45,800
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	20,400
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	
Number of major-road approaches with right-turn lanes (0,1,2)		0	
Data for signalized intersections only:		--	
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	3
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			5
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	1
Schools within 300 m (1,000 ft.) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft.) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	0.91	1.00	1.00	0.91	1.00	0.61

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	16.049	1.000	16.049	0.61	1.00	9.731
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	5.512	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	5.682	0.61	1.00	3.445
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	10.057	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	10.367	0.61	1.00	6.286

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	3.445	1.000	6.286	9.731
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	1.550	0.483	3.036	4.587
Head-on collision	0.049	0.169	0.030	0.189	0.357
Angle collision	0.347	1.196	0.244	1.534	2.729
Sideswipe	0.099	0.341	0.032	0.201	0.542
Other multiple-vehicle collision	0.055	0.189	0.211	1.326	1.516

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.792	1.000	0.792	0.61	1.00	0.480
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.172	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.219	0.174	0.61	1.00	0.105
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.614	$(5)_{TOTAL}-(5)_{FI}$ = 0.781	0.618	0.61	1.00	0.375

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.105	1.000	0.375	0.480
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.001	0.001
Collision with fixed object	0.744	0.078	0.870	0.326	0.405
Collision with other object	0.072	0.008	0.070	0.026	0.034
Other single-vehicle collision	0.040	0.004	0.023	0.009	0.013
Single-vehicle noncollision	0.141	0.015	0.034	0.013	0.028

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.013	3.11	1.00	0.039
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.039

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	9.731	0.480	10.212	0.015	1.00	0.153
Fatal and injury (FI)	--	--	--	--	1.00	0.153

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	1.550	3.036	4.587
Head-on collisions (from Worksheet 2D)	0.169	0.189	0.357
Angle collisions (from Worksheet 2D)	1.196	1.534	2.729
Sideswipe (from Worksheet 2D)	0.341	0.201	0.542
Other multiple-vehicle collision (from Worksheet 2D)	0.189	1.326	1.516
Subtotal	3.445	6.286	9.731
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.078	0.326	0.405
Collision with other object (from Worksheet 2F)	0.008	0.026	0.034
Other single-vehicle collision (from Worksheet 2F)	0.004	0.009	0.013
Single-vehicle noncollision (from Worksheet 2F)	0.015	0.013	0.028
Collision with pedestrian (from Worksheet 2G or 2I)	0.039	0.000	0.039
Collision with bicycle (from Worksheet 2J)	0.153	0.000	0.153
Subtotal	0.298	0.375	0.673
Total	3.743	6.661	10.404

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	10.4
Fatal and injury (FI)	3.7
Property damage only (PDO)	6.7

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Francisco Morales	Roadway	SR 5/US-1
Agency or Company	GOAL Associates Inc.	Intersection	SR 5/US-1 and 26th Street
Date Performed	08/01/23	Jurisdiction	Vero Beach
		Analysis Year	2045

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	38,600
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	5,100
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	
Number of major-road approaches with right-turn lanes (0,1,2)		0	
Data for signalized intersections only:		--	
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	3
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	1
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Protected / Permissive
Type of left-turn signal phasing for Leg #2		--	Protected / Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			5
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	2
Schools within 300 m (1,000 ft.) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft.) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	0.92	0.96	1.00	0.91	1.00	0.59

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	9.716	1.000	9.716	0.59	1.00	5.713
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	3.321	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.354	3.441	0.59	1.00	2.023
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	6.056	$(5)_{TOTAL}-(5)_{FI}$ = 0.646	6.275	0.59	1.00	3.690

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	2.023	1.000	3.690	5.713
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.910	0.483	1.782	2.693
Head-on collision	0.049	0.099	0.030	0.111	0.210
Angle collision	0.347	0.702	0.244	0.900	1.602
Sideswipe	0.099	0.200	0.032	0.118	0.318
Other multiple-vehicle collision	0.055	0.111	0.211	0.779	0.890

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.485	1.000	0.485	0.59	1.00	0.285
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.107	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.220	0.107	0.59	1.00	0.063
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.380	$(5)_{TOTAL}-(5)_{FI}$ = 0.780	0.378	0.59	1.00	0.222

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.063	1.000	0.222	0.285
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.001
Collision with fixed object	0.744	0.047	0.870	0.194	0.240
Collision with other object	0.072	0.005	0.070	0.016	0.020
Other single-vehicle collision	0.040	0.003	0.023	0.005	0.008
Single-vehicle noncollision	0.141	0.009	0.034	0.008	0.016

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.008	3.11	1.00	0.024
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.024

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	5.713	0.285	5.998	0.015	1.00	0.090
Fatal and injury (FI)	--	--	--	--	1.00	0.090

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.910	1.782	2.693
Head-on collisions (from Worksheet 2D)	0.099	0.111	0.210
Angle collisions (from Worksheet 2D)	0.702	0.900	1.602
Sideswipe (from Worksheet 2D)	0.200	0.118	0.318
Other multiple-vehicle collision (from Worksheet 2D)	0.111	0.779	0.890
Subtotal	2.023	3.690	5.713
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.001
Collision with fixed object (from Worksheet 2F)	0.047	0.194	0.240
Collision with other object (from Worksheet 2F)	0.005	0.016	0.020
Other single-vehicle collision (from Worksheet 2F)	0.003	0.005	0.008
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.008	0.016
Collision with pedestrian (from Worksheet 2G or 2I)	0.024	0.000	0.024
Collision with bicycle (from Worksheet 2J)	0.090	0.000	0.090
Subtotal	0.177	0.222	0.399
Total	2.200	3.912	6.112

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	6.1
Fatal and injury (FI)	2.2
Property damage only (PDO)	3.9

Worksheet 4A -- Predicted Crashes by Collision and Site Type and Observed Crashes Using the Project-Level EB Method for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Collision type / Site type	**Predicted crashes**			**Observed crashes, $N_{observed}$** (crashes/year)	**Overdispersion Parameter, k**	**$N_{predicted\ w0}$** Equation A-8 $(6)*(2)^2$	**$N_{predicted\ w1}$** Equation A-9 sqrt((6)*(2))	**W_0** Equation A-10	**N_0** Equation A-11	**w_1** Equation A-12	**N_1** Equation A-13	**$N_{expected/comb}$** Equation A-14
	$N_{predicted}$ (TOTAL)	$N_{predicted}$ (FI)	$N_{predicted}$ (PDO)									
ROADWAY SEGMENTS												
Multiple-vehicle nondriveway												
Segment 1	5.456	1.527	3.929	--	1.010	30.070	2.348	--	--	--	--	--
Segment 2	3.798	1.100	2.699	--	0.840	12.120	1.786	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
Single-vehicle												
Segment 1	0.784	0.163	0.621	--	0.910	0.559	0.844	--	--	--	--	--
Segment 2	0.971	0.174	0.796	--	0.810	0.764	0.887	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
Multiple-vehicle driveway-related												
Segment 1	6.176	2.112	4.064	--	0.810	30.893	2.237	--	--	--	--	--
Segment 2	0.430	0.139	0.291	--	0.810	0.150	0.590	--	--	--	--	--
Segment 3				--				--	--	--	--	--
Segment 4				--				--	--	--	--	--
INTERSECTIONS												
Multiple-vehicle												
Intersection 1	9.731	3.445	6.286	--	0.390	36.933	1.948	--	--	--	--	--
Intersection 2	5.713	2.023	3.690	--	0.390	12.729	1.493	--	--	--	--	--
Intersection 3				--				--	--	--	--	--
Intersection 4				--				--	--	--	--	--
Single-vehicle												
Intersection 1	0.480	0.105	0.375	--	0.360	0.083	0.416	--	--	--	--	--
Intersection 2	0.285	0.063	0.222	--	0.360	0.029	0.320	--	--	--	--	--
Intersection 3				--				--	--	--	--	--
Intersection 4				--				--	--	--	--	--
COMBINED (sum of column)	33.825	10.851	22.973	22	--	124.329	12.869	0.214	24.529	0.724	30.566	27.547

Worksheet 4B -- Predicted Pedestrian and Bicycle Crashes for Urban and Suburban Arterials

(1)	(2)	(3)
Site Type	**N_{ped}**	**N_{bike}**
ROADWAY SEGMENTS		
Segment 1	0.112	0.025
Segment 2	0.187	0.094
Segment 3		
Segment 4		
INTERSECTIONS		
Intersection 1	0.039	0.153
Intersection 2	0.024	0.090
Intersection 3		
Intersection 4		
COMBINED (sum of column)	0.362	0.362

Worksheet 4C -- Project-Specific EB Method Summary Results for Urban and Suburban Arterials

(1)	(2)	(3)	(4)	(5)	(6)
Crash severity level	**$N_{predicted}$**	**N_{ped}**	**N_{bike}**	$N_{expected\ (vehicle)}$	$N_{expected}$
Total	$(2)_{COMB}$ from Worksheet 4A	$(2)_{COMB}$ from Worksheet 4B	$(3)_{COMB}$ from Worksheet 4B	$(13)_{COMB}$ Worksheet 4A	(3)+(4)+(5)
	33.8	0.4	0.4	27.5	28.3
Fatal and injury (FI)	$(3)_{COMB}$ from Worksheet 4A	$(2)_{COMB}$ from Worksheet 4B	$(3)_{COMB}$ from Worksheet 4B	$(5)_{TOTAL} * (2)_{FI} / (2)_{TOTAL}$	(3)+(4)+(5)
	10.9	0.4	0.4	8.8	9.6
Property damage only (PDO)	$(4)_{COMB}$ from Worksheet 4A	--	--	$(5)_{TOTAL} * (2)_{PDO} / (2)_{TOTAL}$	(3)+(4)+(5)
	23.0	0.0	0.0	18.7	18.7

CMF / CRF Details

CMF ID: 7732

CMF Name: Add a through lane on both directions and a raised median

Description:

Prior Condition: Two-lane undivided roadways

Category: Roadway

Study ID: *Validation and Application of Highway Safety Manual (Part D) in Florida*, Abdel-Aty et al. 2014

Star Quality Rating	
Star Quality Rating:	4 Stars

Crash Modification Factor (CMF)	
Value:	0.32
Adjusted Standard Error:	
Unadjusted Standard Error:	0.08

Crash Reduction Factor	
Value:	68
Adjusted Standard Error:	
Unadjusted Standard Error:	9

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Minimum Number of Lanes:	2
Maximum Number of Lanes:	2
Number of Lanes Direction:	
Number of Lanes Comment:	
Road Division Type:	Undivided
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Average Major Road Volume:	
Average Minor Road Volume:	

Development Details

Date Range of Data Used:	
Municipality:	
State:	FL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	41 sites before, 41 sites after
Sample Size (miles):	8.578 miles before

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Mar 08, 2016
Comments:	The number of crashes in the after period were not reported in this study, however, they have been recorded as 300 to give 10 points as a beneift of doubt for one or more of the following: (1) number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3) reporting AADTs for the aggregate dataset but not for the disaggragate dataset used for CMF development.

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CMF / CRF Details

CMF ID: 10889

CMF Name: Convert intersection to displaced left turn intersection

Description:

Prior Condition: Conventional Signalized Intersection

Category: Intersection geometry

Study ID: *Evaluation of displaced left-turn intersections*, Abdelrahman et al. 2020

Star Quality Rating	
Star Quality Rating:	2 Stars

Crash Modification Factor (CMF)	
Value:	1.112
Adjusted Standard Error:	
Unadjusted Standard Error:	0.046

Crash Reduction Factor	
Value:	-11.2
Adjusted Standard Error:	
Unadjusted Standard Error:	4.6

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Minimum Number of Lanes:	
Maximum Number of Lanes:	
Number of Lanes Direction:	
Number of Lanes Comment:	
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban and suburban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 20288 to Maximum of 70000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 6075 to Maximum of 43000 Annual Average Daily Traffic (AADT)

Average Major Road Volume:	49827 Annual Average Daily Traffic (AADT)
Average Minor Road Volume:	23883 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	CO,LA,OH,UT
Country:	
Type of Methodology Used:	

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Jul 01, 2021
Comments:	

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CMF / CRF Details

CMF ID: 10851

CMF Name: Convert intersection to media U-turn (MUT) intersection

Description:

Prior Condition: Conventional Signalized Intersection

Category: Intersection geometry

Study ID: *Safety Evaluation of Median U-Turn Crossover-Based Intersections*, Al-Omari et al. 2020

Star Quality Rating	
Star Quality Rating:	5 Stars

Crash Modification Factor (CMF)	
Value:	0.633
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor	
Value:	36.7
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Minimum Number of Lanes:	
Maximum Number of Lanes:	
Number of Lanes Direction:	
Number of Lanes Comment:	
Road Division Type:	Divided by Median
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban and suburban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 25512 to Maximum of 85076 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 246 to Maximum of 37958 Annual Average Daily Traffic (AADT)

Average Major Road Volume:	55616 Annual Average Daily Traffic (AADT)
Average Minor Road Volume:	13338 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	2008 to 2017
Municipality:	
State:	MI,NC,OH
Country:	
Type of Methodology Used:	

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Jul 01, 2021
Comments:	This CMF is for Type A MUT Intersection. A pictorial representation of Type A and Type B MUT Intersection is presented in Figure 2 in the paper.

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CMF / CRF Details

CMF ID: 3935

CMF Name: Install raised median

Description:

Prior Condition: Unknown

Category: Access management

Study ID: *A comparative Full Bayesian before-and-after anaylsis and application to urban road safety countermeasures in New Jersey*, Yanmaz-Tuzel and Ozbay 2010

Star Quality Rating	
Star Quality Rating:	2 Stars

Crash Modification Factor (CMF)	
Value:	0.86
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor	
Value:	14
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Principal Arterial
Minimum Number of Lanes:	2
Maximum Number of Lanes:	2
Number of Lanes Direction:	
Number of Lanes Comment:	
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	45
Speed Unit:	mph
Speed Limit Comment:	< = 45 mph
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Average Major Road Volume:	
Average Minor Road Volume:	

Development Details

Date Range of Data Used:	2001 to 2006
Municipality:	
State:	NJ
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (crashes):	75 crashes before, 72 crashes after

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Jun 04, 2012
Comments:	

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