Project Development and Environment Study

S.R. 31

From S.R. 80 (Palm Beach Blvd) to S.R. 78 (Bayshore Rd.)

Project Traffic Analysis Report

Addendum

Financial Project ID: 441942-1-22-01
ETDM No.: 14359
Lee County, Florida

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Prepared for the

Florida Department of Transportation
District One

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Section 1.0
EXECUTIVE SUMMARY

This is an addendum to the Project Traffic Analysis Report (PTAR) which was submitted in April 2020. This addendum was prepared to document the following:

- The change of project analysis years to Opening Year (2025) and Design Year (2045) to be consistent with the "*SR 31 PD&E Study from SR 78 to Cook Brown Road*", which is to the immediate north of this study. The PTAR submitted in April 2020 shows Opening Year (2026) and Design Year (2046).
- Revised safety evaluation of SR 31 study corridor (segment only) for a five-year period of 2017-2021.
- Revisions to Annual Average Daily Traffic (AADT) and Design Hour Volumes (DHVs) along the study corridor as a result of the proposed SR 31 realignment to the east and the proposed access modifications.
- Traffic evaluation of the directional median openings located at NW Development Driveway N/RaceTrac Driveway N & LJ's Lounge Driveway and the traffic evaluation of the proposed full median opening at Marina & Restaurant Entrance. This full median opening was developed because of the proposed realignment of SR 31 study corridor to the east.

Screening of intersection alternatives for the SR 31 at SR 80 signalized intersection were performed utilizing FDOT's Intersection Control Evaluation (ICE) process and documented separately. Please refer to the "*ICE Technical Analysis Memorandum – Traffic and Safety Analysis at SR 80 and SR 31, Lee County, FL, August 2022*" for the intersection control strategies that were identified and evaluated as part of this PD&E Study.

Based on the future year analysis results, the SR 31 study corridor in the No-Build condition is not expected to operate at acceptable LOS condition (LOS D) or better, under both Opening Year (2025) and Design Year (2045) conditions. In the Build condition, the proposed widening of SR 31 to a six-lane facility is expected to improve traffic operations within the study area.

1.1 SR 31 at SR 80 Intersection

Please refer to the ICE Memorandum prepared for this intersection as part of this study.

1.2 Directional Median Openings

Further, under Build (**Option 1**) w/ at-grade SR 31 at SR 80 intersection geometry, the proposed directional median openings along SR 31 located at the frontage roads of NW Development Driveway N/ RaceTrac Driveway N and LJ's Lounge are expected to perform at acceptable LOS conditions (LOS D) or better, for the Opening Year (2025). However, in the Design Year (2045) the left turns at the directional median openings are expected to experience excessive delays.

Under Build (**Option 2**) w/ grade-separated crossover SR 31 at SR 80 intersection geometry, the proposed directional median opening along LJ's Lounge is expected to perform at acceptable LOS conditions (LOS D) or better, for the Opening Year (2025). However, in the Design Year (2045) the left turns at the directional median opening are expected to experience excessive delays.

Based on the operational evaluation of directional median opening traffic conditions, Build (**Option 2**) w/ grade-separated crossover SR 31 at SR 80 intersection geometry will help in re-routing the LJ's Lounge directional median opening traffic to the Texas U-turn located SR 80 intersection and the Marina Drive (Dock Entrance)/Restaurant Driveway intersection, in the Design Year (2045). Therefore, it is recommended to consider Build (Option 2) based on traffic evaluation results.

1.3 SR 31 at Marina and Restaurant Entrance Intersection

The combined Marina Drive (Dock Entrance)/Restaurant Driveway intersection with the proposed realignment of SR 31 showed a need for signalization starting from the Opening Year (2025) conditions based on Synchro operational evaluation and warrants analysis, where warrants 1 and 2 were satisfied.

Section 2.0
TRAFFIC ANALYSIS ASSUMPTIONS

No change from the PTAR submitted in April 2020.

Section 3.0
INTRODUCTION

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environmental (PD&E) Study (Financial Project Number – 441942-1-22-01) for SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road) in Lee County, Florida. This is an addendum to the Project Traffic Analysis Report (PTAR) which was submitted in April 2020. This addendum was prepared to document the following:

- The change of project analysis years to Opening Year (2025) and Design Year (2045) to be consistent with the "SR 31 PD&E Study from SR 78 to Cook Brown Road", which is to the immediate north of this study. The PTAR submitted in April 2020 shows Opening Year (2026) and Design Year (2046).
- Revised safety evaluation of SR 31 study corridor (segment only) for a five-year period of 2017-2021.
- Revisions to Annual Average Daily Traffic (AADT) and Design Hour Volumes (DHVs) along the study corridor as a result of the proposed SR 31 realignment to the east and the proposed access modifications.
- Traffic evaluation of the directional median openings located at NW Development Driveway N/RaceTrac Driveway N & LJ's Lounge Driveway and the traffic evaluation of the proposed full median opening at Marina & Restaurant Entrance. This full median opening was developed because of the proposed realignment of SR 31 study corridor to the east.

Screening of intersection alternatives for the SR 31 at SR 80 signalized intersection were performed utilizing FDOT's Intersection Control Evaluation (ICE) process and documented separately. Please refer to the "*ICE Technical Analysis Memorandum – Traffic and Safety Analysis at SR 80 and SR 31, Lee County, FL, August 2022*" for the intersection control strategies that were identified and evaluated as part of this PD&E Study.

3.1 Description of the Project

No change from the PTAR submitted in April 2020.

3.2 Objective

No change from the PTAR submitted in April 2020.

3.3 Methodology

No change from the PTAR submitted in April 2020.

3.4 Transportation Plan Consistency

No change from the PTAR submitted in April 2020.

Section 4.0
TRAFFIC ANALYSIS METHOD

No change from the PTAR submitted in April 2020.

Section 5.0
EXISTING CONDITIONS

No change from the PTAR submitted in April 2020 except safety evaluation section.

5.1 Existing Roadway Characteristics

No change from the PTAR submitted in April 2020.

5.2 Multi-Modal Facilities

No change from the PTAR submitted in April 2020.

5.3 Traffic Data Collection

No change from the PTAR submitted in April 2020.

5.4 Existing Design Traffic Characteristics

No change from the PTAR submitted in April 2020.

5.4.1 K Factor

No change from the PTAR submitted in April 2020.

5.4.2 D Factor

No change from the PTAR submitted in April 2020.

5.4.3 T_{24} Factor

No change from the PTAR submitted in April 2020.

5.5 Existing Year (2019) LOS Analysis

No change from the PTAR submitted in April 2020.

5.5.1 Existing Roadway LOS Analysis

No change from the PTAR submitted in April 2020.

5.5.2 Existing Year HCM Capacity Analysis

No change from the PTAR submitted in April 2020.

5.5.3 Existing Intersection Analysis – Synchro

No change from the PTAR submitted in April 2020.

5.6 Safety Evaluation

In addition to the traffic operations, safety is an important consideration in evaluating intersection alternatives. Typically, historical crash data is reviewed to gain an understanding of the current crash patterns at study intersections. Crash records were reviewed, and various crash metrics are summarized to support identification and evaluation of alternatives.

5.6.1 Historic Crash Summary

Crash data for the SR 31 segment between SR 80 and SR 78 was obtained for the most recent five-year period (2017 -2021). A total of 33 crashes were reported during the five-year analysis period. Number of crashes per year varied from one to thirteen. **Figure 5-1** shows the crashes by year. Out of the 33 crashes reported, one (3%) fatal crash, eight (24%) of the crashes resulted in injuries and the remaining 24 (73%) were property damage only crashes. A pedestrian was involved in the fatal crash which occurred during the daylight, clear weather, dry roadway surface condition and the event happened on the shoulder along SR 31. Based on the long report, the vehicle was traveling southbound on SR 31, north of Palm Beach Boulevard and the pedestrian was walking northbound on the west side paved shoulder. The front right of the vehicle collided with the pedestrian. Rear-end crashes accounted for 34% (11) of the total crashes. Majority of crashes (64%) occurred under daylight conditions. 3 (9%) crashes occurred under wet road surface conditions. **Figure 5-2** shows the summary of crashes by severity, crash type, lighting conditions and road surface conditions. Crash locations based on type of crashes and severity are depicted on **Figure 5-3 and 5-4**, respectively.

5.6.2 Intersection and Location Specific Crashes

Please refer to the ICE memorandum prepared for the SR 31 at SR 80 intersection for crash analysis related to this intersection.

A total seven crashes were reported at the West Marina Drive intersection. Major contributing factors are rear-ended (43%), head-on (29%), and angle crashes (14%).

Over a period of five years (2017-2021), there were ten crashes that took place on the drawbridge. Out of these crashes, 60% (6) were rear-end collisions caused by failure to stop. This can most likely be attributed to the drawbridge operation.

Figure 5-1: SR 31 Segment Crash History

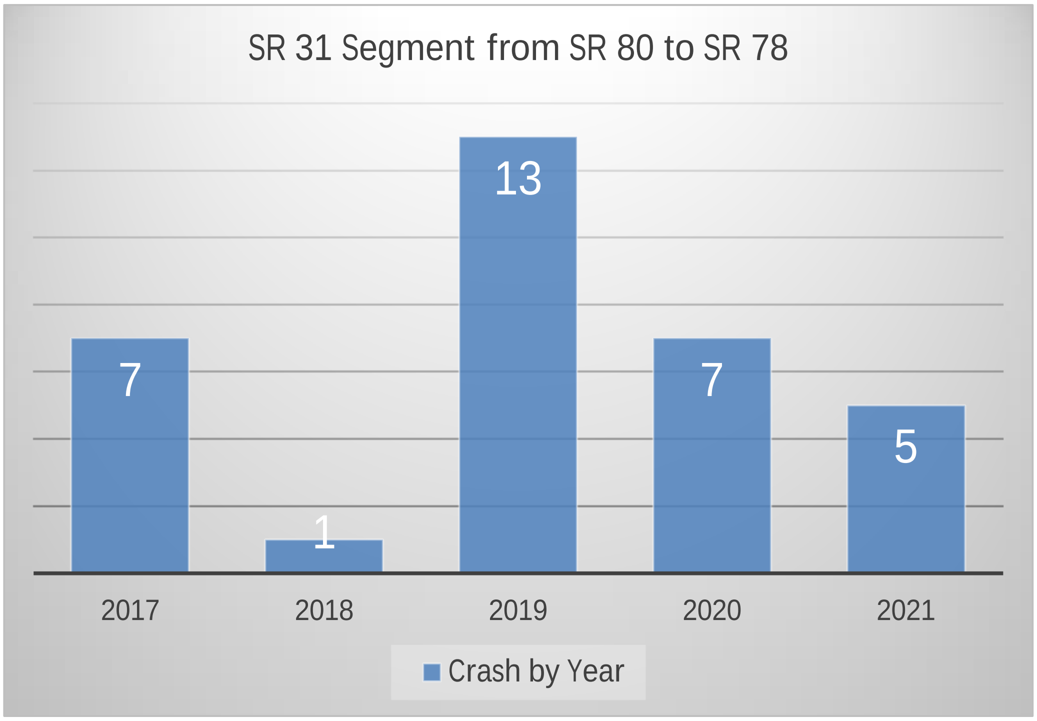


Figure 5-2: SR 31 Segment Crash Summary (2017-2021)

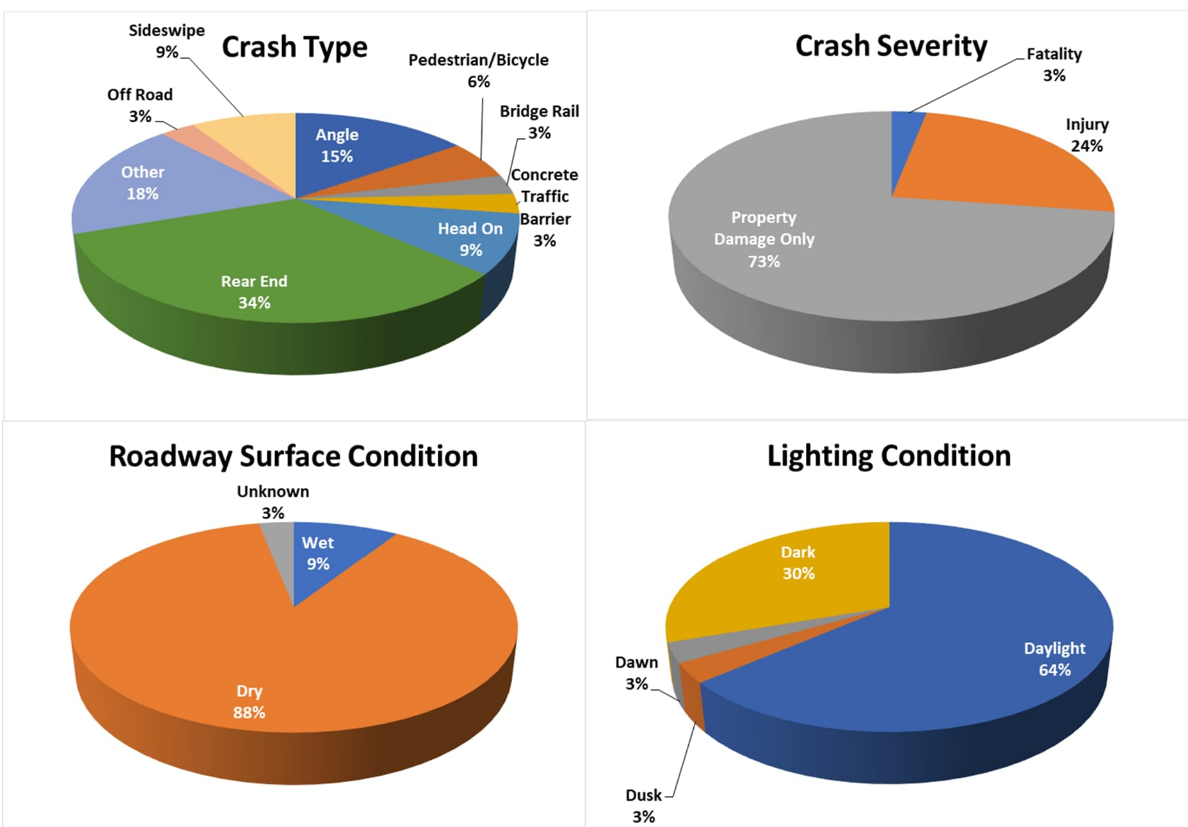


Figure 5-3: Location and Type of Crashes

Figure 5-4: Location and Severity of Crashes

5.6.3 Segment Crash Safety Ratio

Segment crash safety ratio was calculated to compare the annual crash rate of the midblock of SR 31 to the critical crash rate of similar segment throughout District One, Lee County. This method has historically been used by the FDOT and some local agencies to identify high crash locations. This method considers the traffic volumes at specific sites, considers the variance in crash data by including regional or statewide averages, and classifies roadway/intersection types into categories for more applicable comparisons. However, the safety crash ratio method includes the following limitations:

- Assumes a linear relationship between traffic volume and crashes
- Does not consider crash severity

The critical crash rate is based on the average crash rate for a similar facility adjusted by vehicle exposure and a probability constant. The safety ratio represents the actual crash rate divided by the critical crash rate. If a segment has an actual crash rate higher than the critical crash rate (i.e., safety ratio > 1.0), it may have a safety deficiency. Based on **Table 5-1**, the safety ratio for this segment is less than one.

Table 5-1: Segment Crash Safety Ratio

Description	Total Crashes	Actual Crash Rate	Average Crash Rate*	Critical Crash Rate	Safety Ratio
SR 31 Segment	33	1.057	0.446	1.258	0.841

**FDOT CAR Lee County, 5-year Average Crash Rate (2015 - 2019). See Appendix A*

Crash Rate Crashes per Million Vehicle Miles Travelled (MVMT)

Rural 2-3Ln 2Wy Undivided

5.6.4 Highway Safety Manual (HSM) - Predictive Crash Analysis

The ICE memorandum completed for the SR 31 at SR 80 intersection includes predictive safety analysis for segment of SR 31study corridor from SR 80 to LJ's Lounge Driveway. This addendum includes predictive safety analysis for the SR 31 study corridor from LJ's Lounge Driveway to south of SR 78, which is the northern section of the study corridor. The analysis was conducted using the predictive methods in Chapters 12 of the HSM, Urban and Suburban Arterials (750-020-21c), which apply a combination of Safety Performance Functions (SPFs), crash modification factors (CMFs), and calibration factors to estimate crash frequency for each segment and intersection. The tool was adjusted based on the crash distribution for Florida based on Table 122.6.4 from the FDOT Design Manual 2022. The growth rates were estimated based on 2025 and 2045 AADTs for this study.

Note that the resulting predictions should be used with caution if the input AADTs (highlighted cell in the HSM tools) exceed the range of data used to develop one or more of the SPFs. The SPFs to local conditions were calibrated by applying calibration factors shown in Table 122.6.3 of the

FDOT Design Manual 2022. The Empirical Bayes method is used when the proposed modification does not create a major geometric modification; therefore, the analysis is performed starting from the existing year of the project. However, Empirical Bayes method is not applicable for this project due to major improvement along SR 31 project corridor.

It is important to note that the safety analysis tools available to date are deterministic in nature and estimate future crashes mainly based on AADT and roadway characteristics. These tools do not account for vehicle interactions (driver behaviors). No-Build is expected to have extensive congestion and queues that may potentially impact crashes. Consequently, crash frequency would be higher compared to Build. Nevertheless, the overall predicted crashes are lower by 44% for Build when compared to No-Build alternative due to added capacity along the SR 31. However, predictive crashes anticipated to increase under Build alternative at the intersection of Marina Drive (Dock Entrance)/ Restaurant Entrance and SR 31 intersection due to installation traffic signal. Traffic signal do not always prevent crashes. In many instances, the total number of crashes and injuries increase after installation of the traffic signal. However, most comment results showed that a reduction in right-angle collisions which is prone to severe crash injury. Detailed analyses are provided in **Appendix B**.

Section 6.0
DEVELOPMENT OF FUTURE YEAR TRAFFIC FORECASTS

Future year traffic forecasts for the major roadways in the study area were developed by the Department as part of the PD&E study conducted on SR 31 from SR 80 to Cook Brown Road. These major roadway traffic forecasts and local developments adjacent to the project corridor were used to develop study corridor specific AADTs and DHVs for the No-Build condition and were documented in the "*Traffic Forecasts Memorandum*" prepared as part of this study.

The No-Build traffic forecasts and the access plan prepared for the Build alternatives was used to develop the Build traffic forecasts for this study. The Build alternatives access management plan is documented in the "*Access Management Memorandum*" prepared for this study.

6.1 Description of Alternatives

Based on discussions with the Department, No-Build Alternative and a Build Alternative were evaluated for Opening Year and Design Year. All the alternatives considered are described in this section.

6.1.1 No-Build Alternative

Similar to existing conditions, the No-Build Alternative assumes that the SR 31 project corridor is a two-lane arterial facility. The intersection geometries and driveway access locations were also assumed to be the same as existing in the No-Build condition.

6.1.2 Build Alternatives

SR 31 is planned to be widened to a six-lane divided facility from SR 80 to Horseshoe Road and a four-lane divided facility from Horseshoe Road to Cook Brown Road. Therefore, within the project limits, SR 31 is assumed to be six-lane divided facility.

The proposed intersection geometries and median opening/ driveway access locations in the Build condition differ from the No-Build as the proposed corridor is a divided roadway. Also, in the proposed Build alternatives, the median opening/ driveway locations vary depending on whether SR 31 at SR 80 intersection is at-grade or grade-separated.

The location of median openings for Build (**Option 1**) w/ at-grade SR 31 at SR 80 intersection geometry are listed below:

- Directional Median Openings:
    - SR 31 at Frontage Roads (NW Development Driveway N/ RaceTrac Driveway N)
    - SR 31 at LJ's Lounge

- Full Median Opening
  - SR 31 at Marina and Restaurant Entrance

The location of median openings for Build (**Option 2**) w/ grade-separated crossover SR 31 at SR 80 intersection geometry are listed below:

- Directional Median Openings:
  - SR 31 at LJ's Lounge
- Full Median Opening
  - SR 31 at Marina and Restaurant Entrance

The screening of alternatives for the SR 31 at SR 80 signalized intersection were performed utilizing FDOT's ICE process and documented separately. Please refer to the "*ICE Technical Analysis Memorandum – Traffic and Safety Analysis at SR 80 and SR 31, Lee County, FL, August 2022*" for the intersection control strategies that were identified and evaluated as part of this PD&E Study.

Figure 6-1 shows the No-Build schematic diagram and the proposed Build configuration schematic diagrams with the revised alignment and access changes.

6.2 AADTs and DHVs

Figure 6-2 illustrates the No-Build and Build AADTs for the major road segments and driveways within the study area for Opening Year (2025) and Design Year (2045).

Figure 6-3 and **6-4** illustrates the No-Build DHVs for Opening Year (2025) and Design Year (2045), respectively.

Figure 6-5, 6-6, 6-7 and **6-8** illustrates the Build DHVs for Opening Year (2025) and Design Year (2045), respectively. The Build configuration assumes the proposed access changes along the project corridor to re-distribute the driveway traffic along the project corridor

6.3 Lane Geometry

Figure 6-9 and **6-10** illustrates the intersection geometry used for the Build analysis.

Figure 6-1: No-Build and Build Configuration Schematics

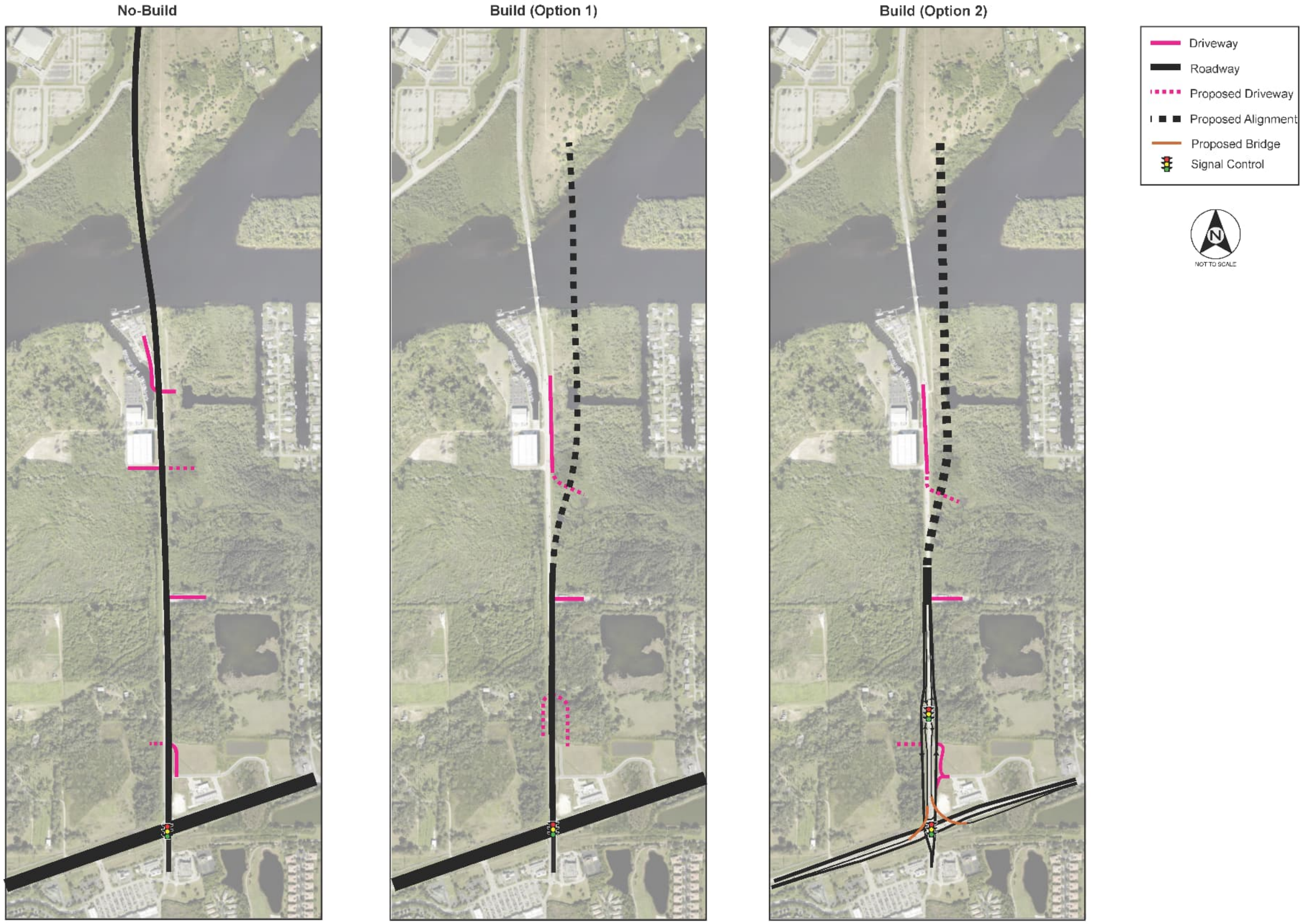


Figure 6-2: Annual Average Daily Traffic (AADT) Volumes

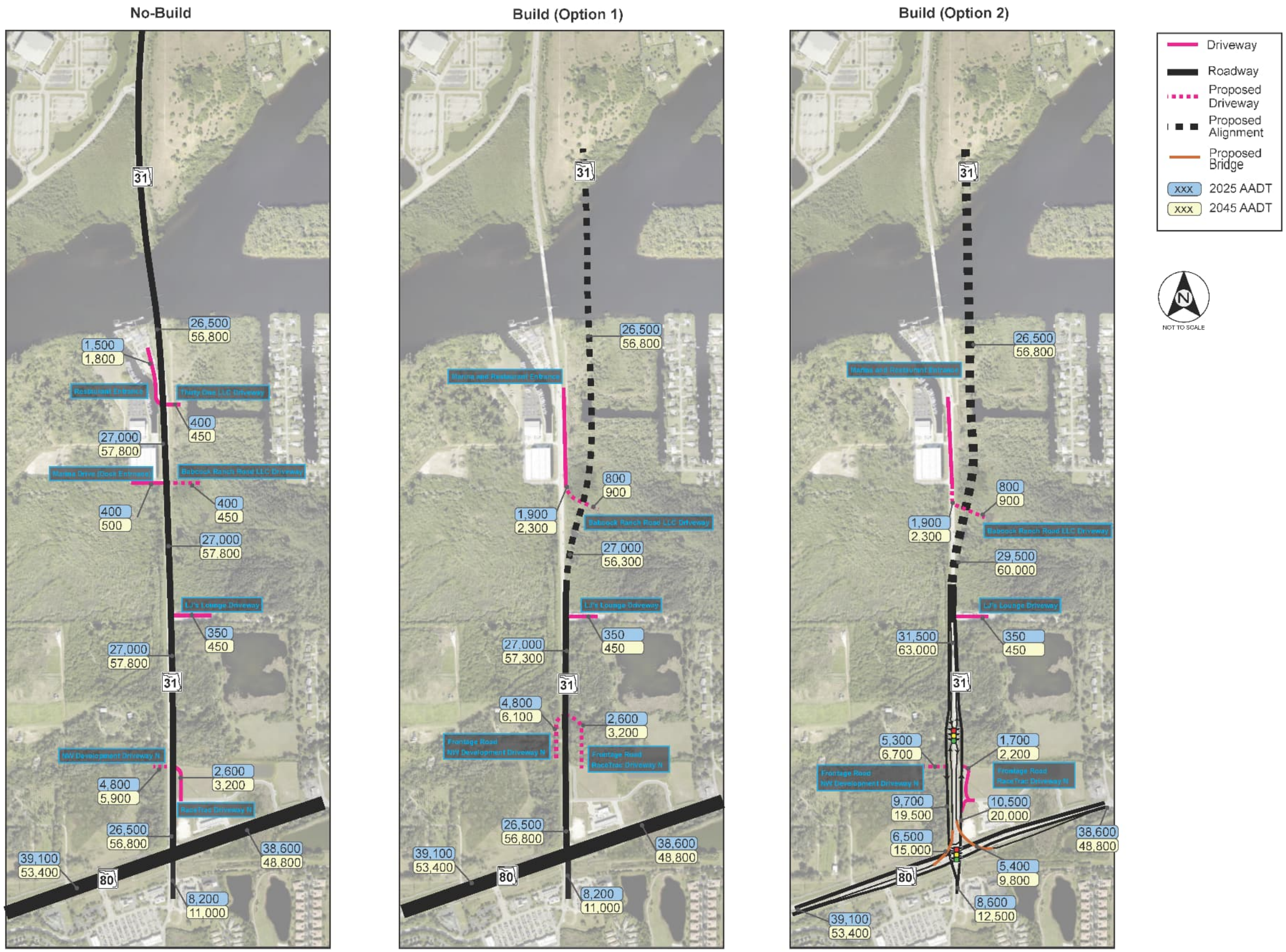


Figure 6-3: No-Build – Opening Year (2025) Design Hour Volumes

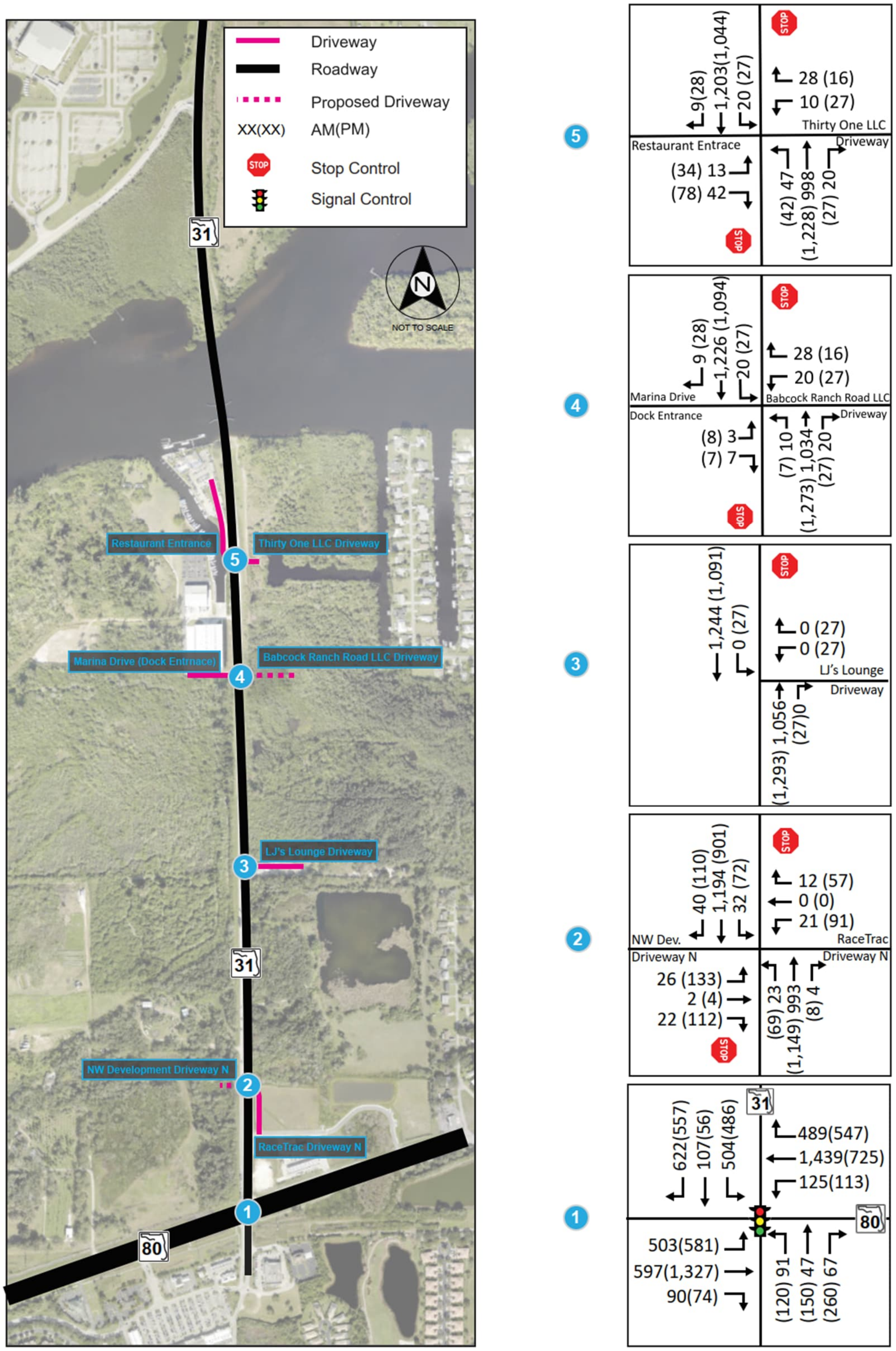


Figure 6-4: No-Build - Design Year (2045) Design Hour Volumes

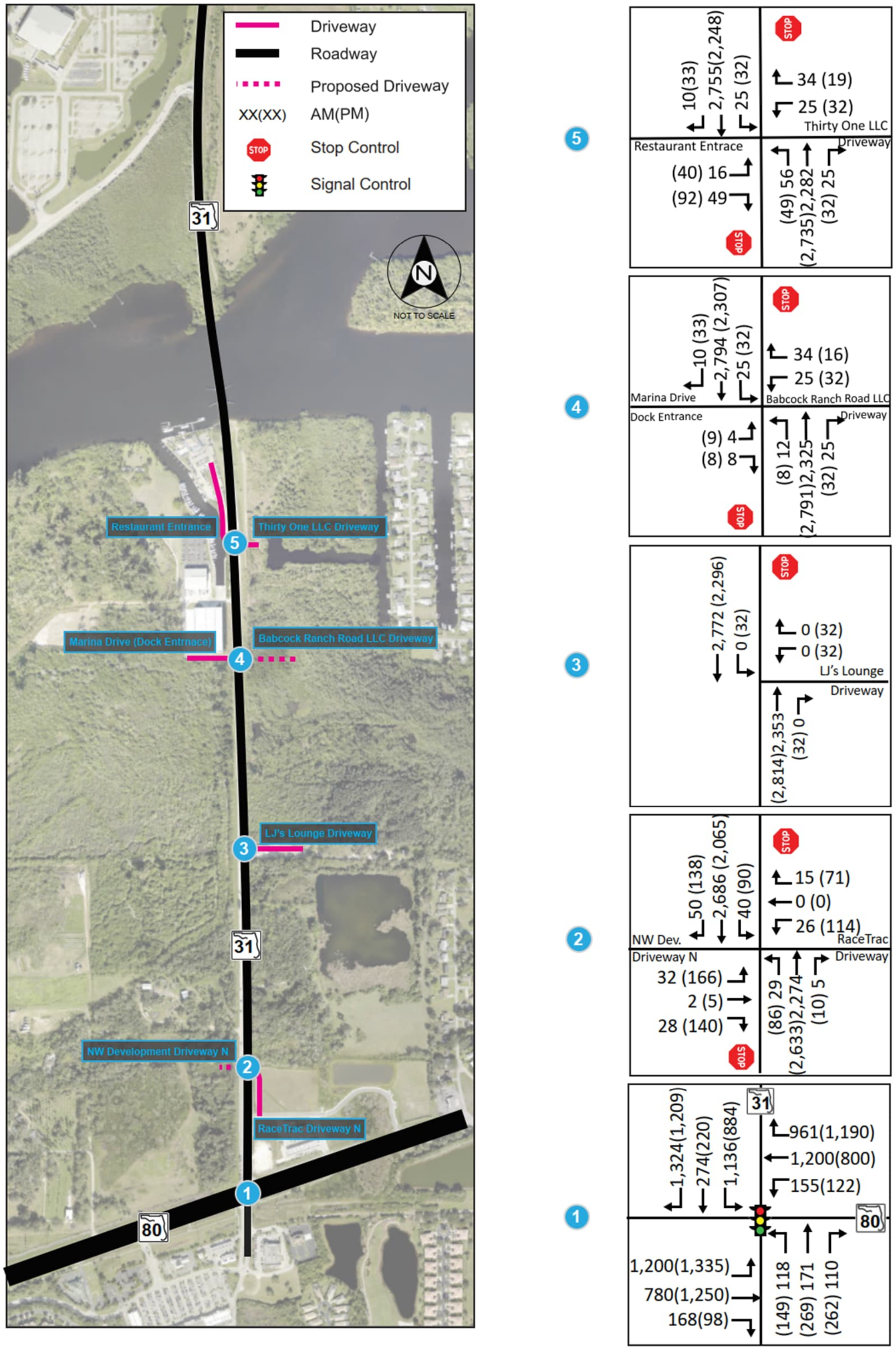


Figure 6-5: Build (Option 1) – Opening Year (2025) Design Hour Volumes

AT-GRADE: SR 31 AT SR 80 INTERSECTION

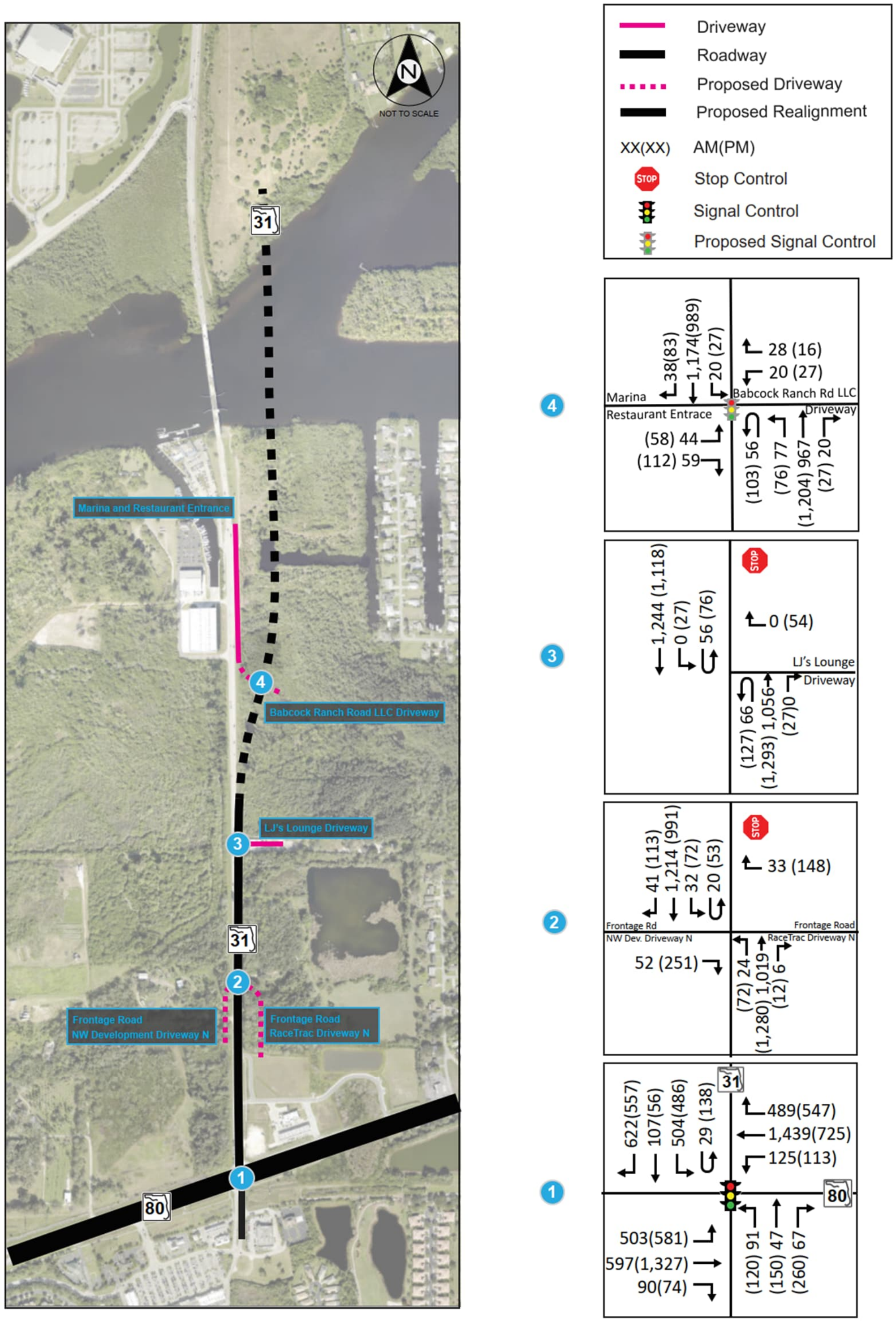


Figure 6-6: Build (Option 1) - Design Year (2045) Design Hour Volumes

AT-GRADE: SR 31 AT SR 80 INTERSECTION

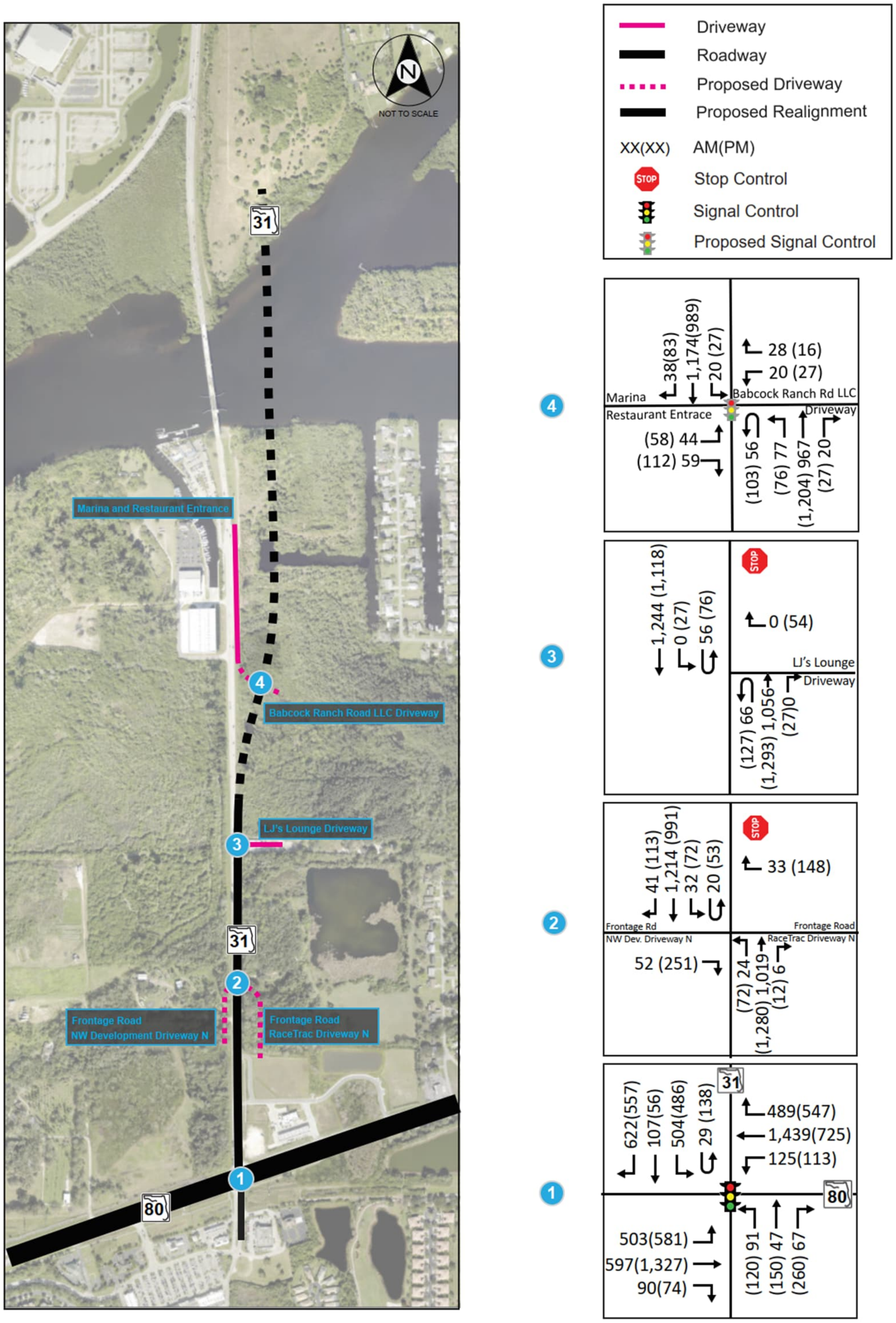


Figure 6-7: Build (Option 2) – Opening Year (2025) Design Hour Volumes

FLYOVER OVERPASS WITH CROSSOVER: SR 31 AT SR 80 INTERSECTION

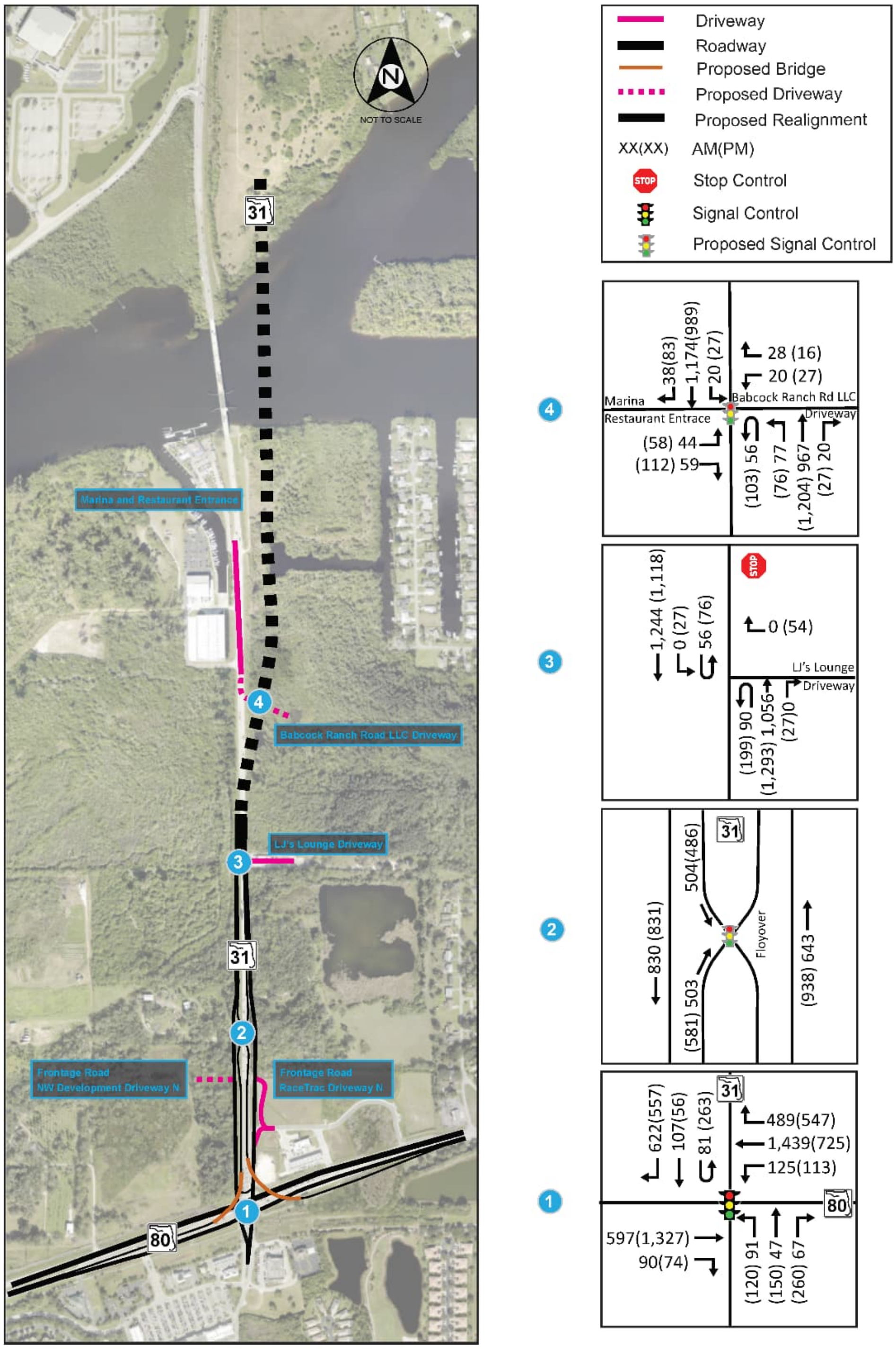


Figure 6-8: Build (Option 2) - Design Year (2045) Design Hour Volumes

FLYOVER OVERPASS WITH CROSSOVER: SR 31 AT SR 80 INTERSECTION

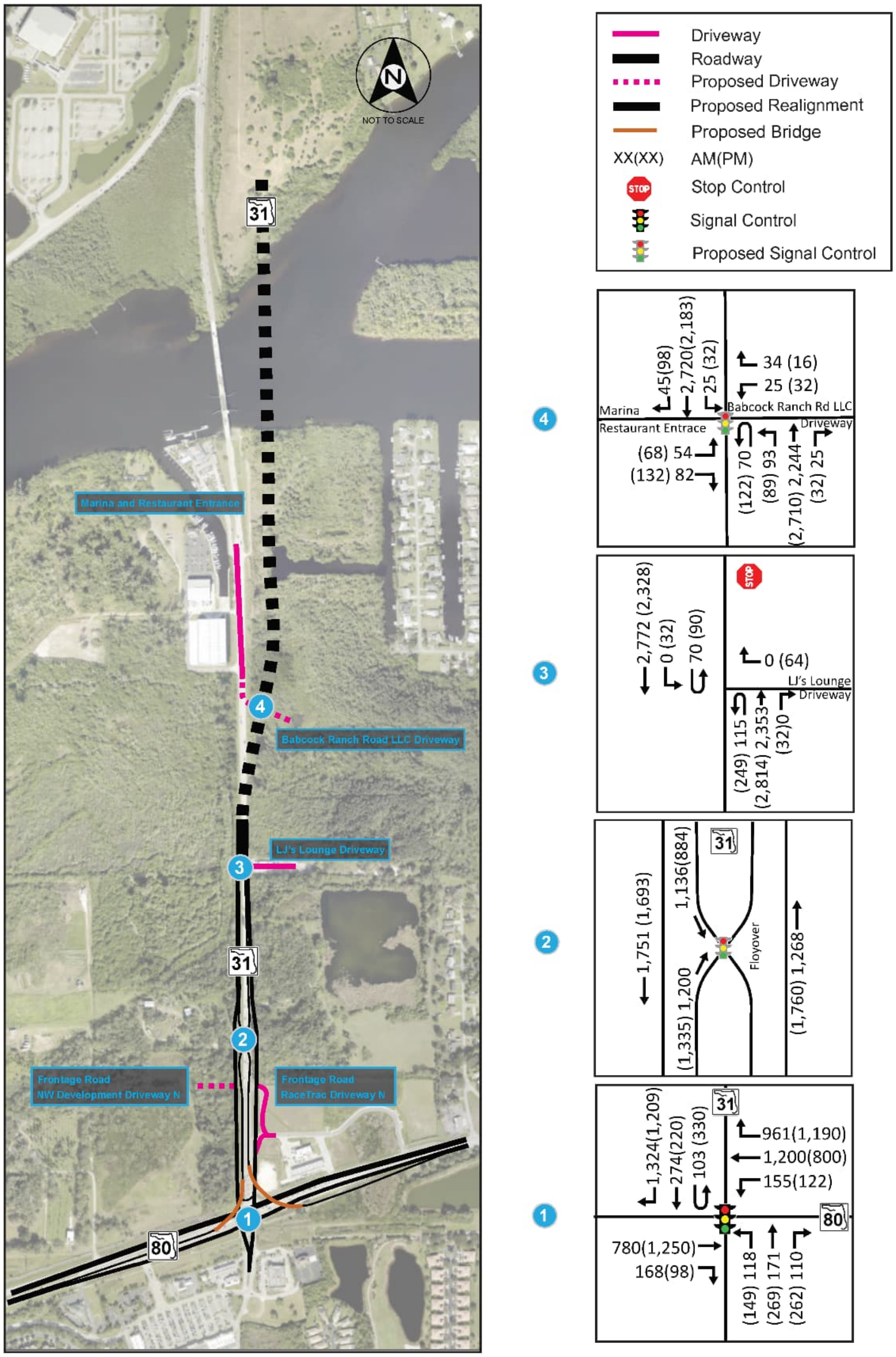


Figure 6-9: Build Alternative (Option 1) – Lane Geometry

AT-GRADE: SR 31 AT SR 80 INTERSECTION

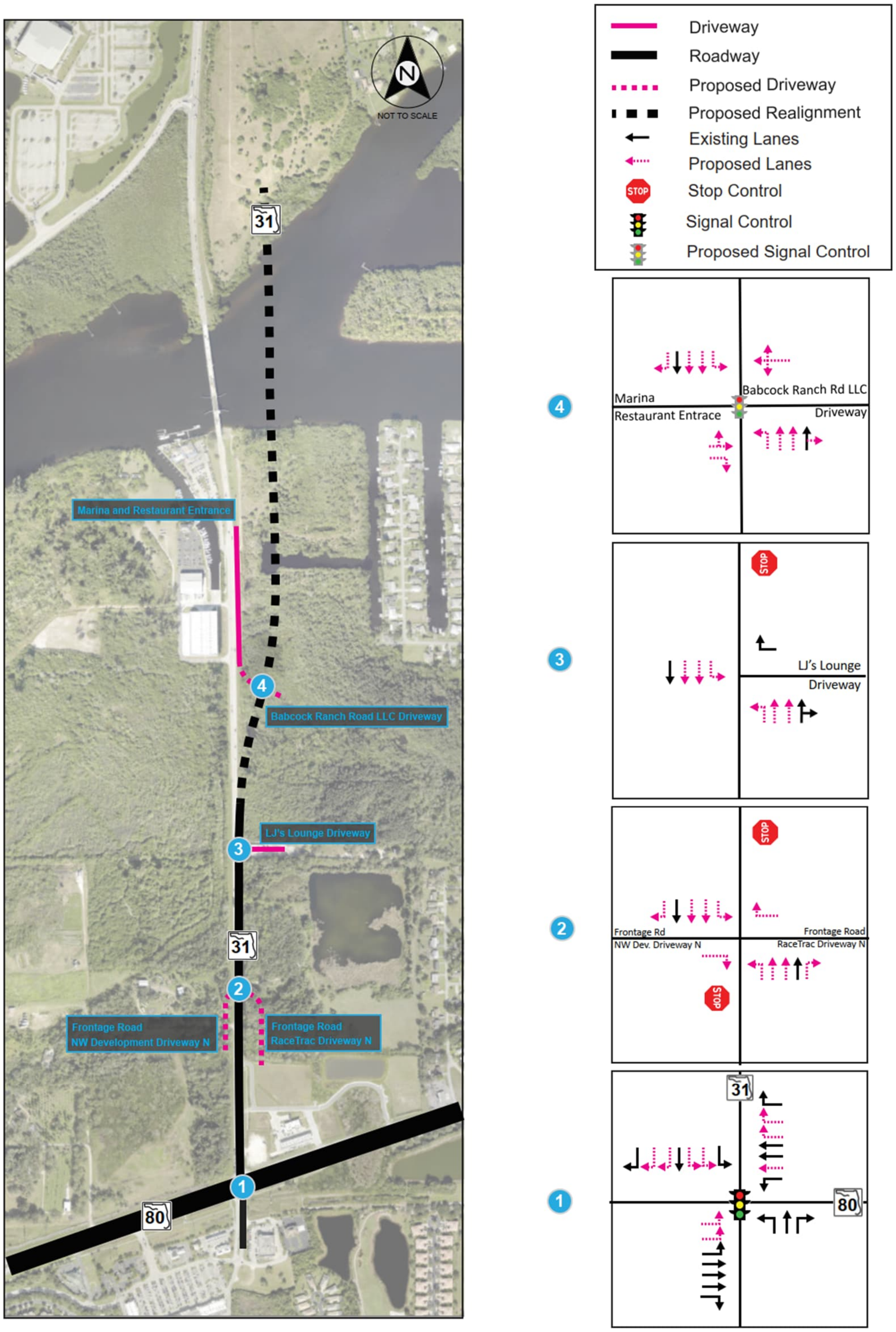
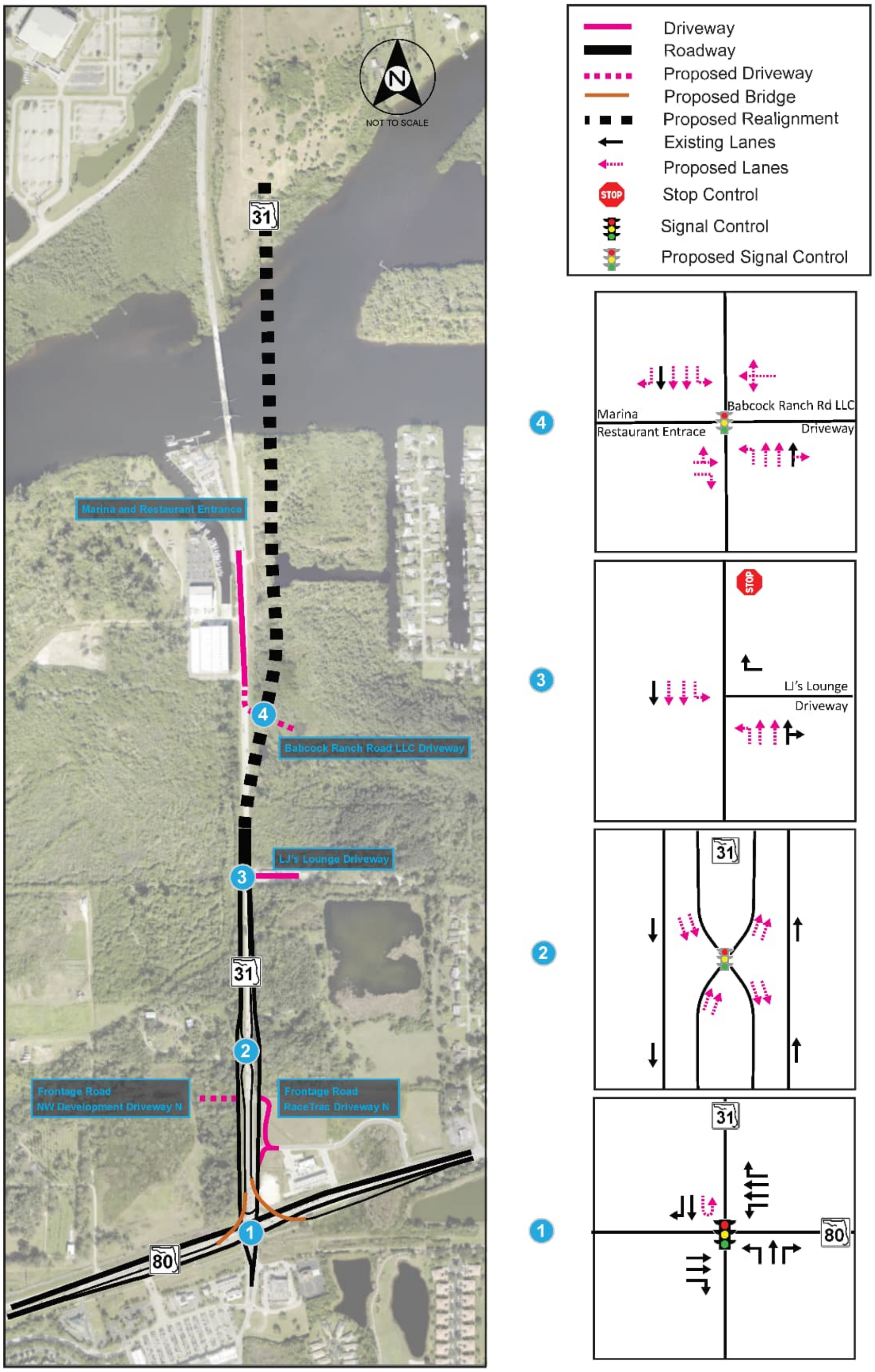


Figure 6-10: Build Alternative (Option 2) – Lane Geometry

FLYOVER OVERPASS WITH CROSSOVER: SR 31 AT SR 80 INTERSECTION



Section 7.0
ALTERNATIVES ANALYSIS

Utilizing the forecasted volumes, future year capacity analyses was performed for opening year (2025) and design year (2045). This section provides a summary of the traffic analysis conducted for No-Build and Build alternatives. Screening of intersection alternatives for the SR 31 at SR 80 signalized intersection were performed utilizing FDOT's ICE process and documented separately. Please refer to the "*ICE Technical Analysis Memorandum – Traffic and Safety Analysis at SR 80 and SR 31, Lee County, FL, August 2022*" for the intersection control strategies that were identified and evaluated as part of this PD&E Study.

7.1 Future Year Roadway Analysis

No change from the PTAR submitted in April 2020. The analysis years changed to Opening Year (2025) and Design Year (2045). However, the traffic volumes used for the analysis remained the same.

7.1.1 No-Build Alternative HCM Capacity Analysis

No change from the PTAR submitted in April 2020.

7.1.2 Build Alternative HCM Capacity Analysis

No change from the PTAR submitted in April 2020.

7.2 Future Year Intersection Analysis

Intersection analysis was conducted using Synchro. The delay and LOS conditions at the signalized and unsignalized conditions were reported using the HCM 6th Edition module in Synchro. The following intersections were evaluated under the Build conditions:

- Directional Median Openings:
  - SR 31 at Frontage Roads (NW Development Driveway N/ RaceTrac Driveway N) – This directional median opening was proposed only with the at-grade (**Option 1**) SR 31 and SR 80 intersection geometry.
  - SR 31 at LJ's Lounge – This directional median opening was proposed with both at-grade (**Option 1**) and grade-separated (**Option 2**) SR 31 and SR 80 intersection geometry
- Full Median Opening

  SR 31 at Marina and Restaurant Entrance (Signal) – Preliminary evaluation conducted for this median opening by assuming bi-directional and full median openings (without a signal) has shown excessive delay conditions for the traffic entering and exiting the Marina and Restaurant Entrance driveway. This median opening will remain signalized under both at-grade (**Option 1**) and grade-separated (**Option 2**) SR 31 and SR 80 intersection geometry. **Appendix C** presents the preliminary synchro evaluation results for this median opening.

7.2.1 Warrants Analysis - SR 31 at Marina and Restaurant Entrance Intersection

In addition to the preliminary Synchro analysis conducted for the SR 31 at Marina and Restaurant Entrance intersection, a traffic signal warrants analysis as outlined in the Manual of -Uniform Traffic Control Devices (MUTCD), was also performed for the Opening Year (2025), Mid-Year (2035) and Design Year (2045) conditions using form 750-020-01. The eight-hour volumes required for future traffic evaluation were developed based on existing traffic counts collected at the Marina and Restaurant driveways and SR 31. The following warrants were applicable for this intersection and were evaluated:

Warrant 1 (eight-hour vehicular volume) – This warrant is applicable where a large volume of intersecting traffic is the principal reason to consider a traffic signal. To meet this warrant, specific traffic volumes on the major street and the higher volume minor street approach must be met or exceeded for at least eight hours on an average day. Because the traffic volume on major street (SR 31) is heavy and the traffic on the minor intersecting street suffers excessive delay, the Interruption of Continuous Traffic, Condition B, volume thresholds were used in Warrant 1. In addition, the 70% volume level was used as one of the volume level criteria in accordance with the MUTCD guidelines as the proposed posted speed limit along SR 31 in the Build condition is 45 mph. This warrant was satisfied as Warrant 1 - Condition B is 100% met for eight hours.

Warrant 2 (four-hour vehicular volume) – Four Hour Vehicular Volumes: This warrant is intended to be applied where the volume of the intersecting traffic is the principal reason to install a traffic signal. This warrant requires the volumes of any four hours to be plotted above the applicable curve, shown on analysis sheets for Warrant 2. This warrant was satisfied as four-hour volumes were plotted above the applicable curve.

A summary of the warrant analysis results is presented in **Table 7-1**. **Appendix D** presents the eight-hour peak volumes developed for warrants analysis and the signal warrants evaluation worksheets.

Table 7-1: Warrants Analysis - SR 31 at Marina and Restaurant Entrance

Warrant #	Warrant Name	Satisfied (Yes/No)		
		Year 2025	Year 2035	Year 2045
1	Eight-Hour Vehicular Volume	Yes	Yes	Yes
2	Four-Hour Vehicular Volume	Yes	Yes	Yes

7.2.2 No-Build Alternative Intersection Analysis

Intersection analysis was not conducted for the No-Build alternative as the segment analysis from the PTAR submitted in April 2020 reported LOS F conditions.

7.2.3 Build Alternative Intersection Analysis

The Build condition intersection evaluation was conducted for the Opening Year (2025) and Design Year (2045). The delay and LOS conditions are presented in **Table 7-2** and **7-3** when analyzed with at-grade SR 31 at SR 80 intersection geometry (**Option 1**) for the Opening Year (2025) and Design Year (2045), respectively. The delay and LOS conditions are presented in **Table 7-4** and **7-5** when analyzed with grade-separated crossover SR 31 at SR 80 intersection geometry (**Option 2**) for the Opening Year (2025) and Design Year (2045), respectively.

Build (**Option 1**): w/ At-Grade SR 31 at SR 80 Intersection Geometry

The directional median opening intersections located at the frontage roads of NW Development Driveway N/ RaceTrac Driveway N and LJ's Lounge are expected to perform under acceptable LOS conditions for the Opening Year (2025). However, under the Design Year (2045) conditions the directional median opening intersections are expected to experience excessive delays.

Traffic operational analysis conducted for the combined Marina Drive (Dock Entrance)/Restaurant Driveway with the proposed realignment of SR 31 and with signalization shows acceptable LOS conditions.

Build (**Option 2**): w/ Grade-Separated crossover SR 31 at SR 80 Intersection Geometry

The directional median opening intersections located at LJ's Lounge is expected to perform under acceptable LOS conditions for the Opening Year (2025). However, under the Design Year (2045) conditions this directional median opening is expected to experience excessive delays.

Similar to Build Option 1, Traffic operational analysis conducted for the combined Marina Drive (Dock Entrance)/Restaurant Driveway with the proposed realignment of SR 31 and with signalization shows acceptable LOS conditions.

Appendix E presents the Synchro analysis outputs for the Opening Year (2025) and Design Year (2045) conditions.

Table 7-2: Build (Option 1) – Opening Year (2025) Intersection Delay/LOS

Roadway	Cross-Street	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Overall
AM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	-	-	16.8/C	-	-	14.4/B	19.5/C	-	-	15.1/C	-	-	19.5/C
	LJs Lounge*	-	-	-	-	-	0/A	14.1/B	-	-	12.2/B	-	-	14.1/B
	Marina Dr (Dock Ent)/ Restaurant Drwy**	26.6/C	0/A	30.1/C	27.3/C	0/A	0/A	38.3/D	6.6/A	7/A	36.8/D	8.2/A	6/A	10/A
PM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	-	-	26.1/D	-	-	24.1/C	19.3/C	-	-	32.6/D	-	-	32.6/D
	LJs Lounge*	-	-	-	-	-	18.2/C	14.2/B	-	-	21.5/C	-	-	21.5/C
	Marina Dr (Dock Ent)/ Restaurant Drwy**	24.8/C	0/A	30.2/C	24.7/C	0/A	0/A	38.1/D	8.8/A	9.4/A	35.6/D	9/A	7.4/A	11.6/B

Note: 00.0/X - Delay/LOS. LOS E and LOS F movements are shown in yellow and orange, respectively. Delay is reported in sec/veh

** Unsignalized intersections with directional median openings/ ** Signalized intersections*

Worst movement delay was reported as overall intersection delay for unsignalized intersections

Table 7-3: Build (Option 1) – Design Year (2045) Intersection Delay/LOS

Roadway	Cross-Street	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Overall
AM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	-	-	89.4/F	-	-	38.7/E	227.6/F	-	-	130/F	-	-	227.6/F
	LJs Lounge*	-	-	-	-	-	0/A	131.9/F	-	-	47.7/E	-	-	131.9/F
	Marina Dr (Dock Ent)/ Restaurant Drwy**	45.1/D	0/A	51.2/D	46.9/D	0/A	0/A	65.3/E	9.1/A	10.2/B	58.7/E	16.1/B	5.8/A	15.4/B
PM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	-	-	520.9/F	-	-	541/F	300.8/F	-	-	-	-	-	541/F
	LJs Lounge*	-	-	-	-	-	105.4/F	141.7/F	-	-	1574.1/F	-	-	1574.1/F
	Marina Dr (Dock Ent)/ Restaurant Drwy**	37.7/D	0/A	46/D	38.9/D	0/A	0/A	51.8/D	17/B	20.8/C	52.8/D	14/B	7.3/A	18.3/B

Note: 00.0/X - Delay/LOS. LOS E and LOS F movements are shown in yellow and orange, respectively. Delay is reported in sec/veh

** Unsignalized intersections with directional median openings/ ** Signalized intersections*

Worst movement delay was reported as overall intersection delay for unsignalized intersections

Table 7-4: Build (Option 2) – Opening Year (2025) Intersection Delay/LOS

Roadway	Cross-Street	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Overall
AM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
SR 31	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	Not Applicable												
SR 31	LJs Lounge*	-	-	-	-	-	0/A	14.7/B	-	-	12.2/B	-	-	14.7/B
SR 31	Marina Dr (Dock Ent)/ Restaurant Drwy**	26.6/C	0/A	30.1/C	27.3/C	0/A	0/A	38.3/D	6.6/A	7/A	36.8/D	8.2/A	6/A	10/A
PM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
SR 31	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	Not Applicable												
SR 31	LJs Lounge*	-	-	-	-	-	18.2/C	16.3/C	-	-	21.5/C	-	-	21.5/C
SR 31	Marina Dr (Dock Ent)/ Restaurant Drwy**	24.8/C	0/A	30.2/C	24.7/C	0/A	0/A	38.1/D	8.8/A	9.4/A	35.6/D	9/A	7.4/A	11.6/B

Note: 00.0/X - Delay/LOS. LOS E and LOS F movements are shown in yellow and orange, respectively. Delay is reported in sec/veh

** Unsignalized intersections with directional median openings/ ** Signalized intersections*

Worst movement delay was reported as overall intersection delay for unsignalized intersections

Table 7-5: Build (Option 2) – Design Year (2045) Intersection Delay/LOS

Roadway	Cross-Street	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Overall
AM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
SR 31	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	Not Applicable												
SR 31	LJs Lounge*	-	-	-	-	-	0/A	231/F	-	-	47.7/E	-	-	231/F
SR 31	Marina Dr (Dock Ent)/ Restaurant Drwy**	45.1/D	0/A	51.2/D	46.9/D	0/A	0/A	65.3/E	9.1/A	10.2/B	58.7/E	16.1/B	5.8/A	15.4/B
PM Peak														
SR 31	SR 80**	Refer to ICE Memorandum												
SR 31	Frontage Roads NW Dev. Drwy N/RaceTrac Drwy N*	Not Applicable												
SR 31	LJs Lounge*	-	-	-	-	-	105.4/F	368.7/F	-	-	1574.1/F	-	-	1574.1/F
SR 31	Marina Dr (Dock Ent)/ Restaurant Drwy**	37.7/D	0/A	46/D	38.9/D	0/A	0/A	51.8/D	17/B	20.8/C	52.8/D	14/B	7.3/A	18.3/B

Note: 00.0/X - Delay/LOS. LOS E and LOS F movements are shown in yellow and orange, respectively. Delay is reported in sec/veh

** Unsignalized intersections with directional median openings/ ** Signalized intersections*

Worst movement delay was reported as overall intersection delay for unsignalized intersections

Section 8.0
SUMMARY OF ANALYSIS RESULTS

Based on the future year analysis results, the SR 31 study corridor in the No-Build condition is not expected to operate at acceptable LOS condition (LOS D) or better, under both Opening Year (2025) and Design Year (2045) conditions. In the Build condition, the proposed widening of SR 31 to a six-lane facility is expected to improve traffic operations within the study area.

8.1 SR 31 at SR 80 Intersection

Please refer to the ICE Memorandum prepared for this intersection as part of this study.

8.2 Directional Median Openings

Further, under Build (**Option 1**) w/ at-grade SR 31 at SR 80 intersection geometry, the proposed directional median openings along SR 31 located at the frontage roads of NW Development Driveway N/ RaceTrac Driveway N and LJ's Lounge are expected to perform at acceptable LOS conditions (LOS D) or better, for the Opening Year (2025). However, in the Design Year (2045) the left turns at the directional median openings are expected to experience excessive delays.

Under Build (**Option 2**) w/ grade-separated crossover SR 31 at SR 80 intersection geometry, the proposed directional median opening along LJ's Lounge is expected to perform at acceptable LOS conditions (LOS D) or better, for the Opening Year (2025). However, in the Design Year (2045) the left turns at the directional median opening are expected to experience excessive delays.

Based on the operational evaluation of directional median opening traffic conditions, Build (**Option 2**) w/ grade-separated crossover SR 31 at SR 80 intersection geometry will help in re-routing the LJ's Lounge directional median opening traffic to the Texas U-turn located SR 80 intersection and the Marina Drive (Dock Entrance)/Restaurant Driveway intersection, in the Design Year (2045). Therefore, it is recommended to consider Build (Option 2) based on traffic evaluation results.

8.3 SR 31 at Marina and Restaurant Entrance Intersection

The combined Marina Drive (Dock Entrance)/Restaurant Driveway intersection with the proposed realignment of SR 31 showed a need for signalization starting from the Opening Year (2025) conditions based on Synchro operational evaluation and warrants analysis, where warrants 1 and 2 were satisfied.

APPENDICES

Appendix A
Lee County – Average Crash Rates Table

District	County	Crash Rate Category	Average Crash Ra	Influence Area Cras	Crash Coun	Millions Entering Vehi	Total Centerline Mi	Average Economic Loss Per	Average Economic Loss Per
1	Lee	Interstate Urban	0.48592	1	2395	4931	142	202809	221380
1	Lee	Interstate Rural	0.33573	0	163	486	29	208367	208169
1	Lee	Toll Road Urban	0	0	0	0	0	0	0
1	Lee	Toll Road Rural	0	0	0	0	0	0	0
1	Lee	Urban Other Limited Acce	0	0	0	0	0	0	0
1	Lee	Rural Other Limited Acces	0	0	0	0	0	0	0
1	Lee	Ramp Urban	0	361	38	8	4	96430	97034
1	Lee	Ramp Rural	0	995	735	258	90	141823	142651
1	Lee	Urban 2-3Ln 2Wy Divd Ra	21.67104	205	51	12	3	205869	194922
1	Lee	Urban 2-3Ln 2Wy Divd Pa	4.10853	82	363	108	18	94142	115001
1	Lee	Urban 2-3Ln 2Wy Undivd	6.32592	47	41	14	5	40777	30346
1	Lee	Suburban 2-3Ln 2Wy Divd	6.70918	39	265	45	6	115072	129724
1	Lee	Suburban 2-3Ln 2Wy Divd	3.29995	158	685	255	43	257639	319875
1	Lee	Suburban 2-3Ln 2Wy Und	0.97159	22	401	435	94	343441	428140
1	Lee	Rural 2-3Ln 2Wy Divd Ras	0	0	0	4	0	0	0
1	Lee	Rural 2-3Ln 2Wy Divd Pav	2.40905	1	29	12	4	880936	878176
1	Lee	Rural 2-3Ln 2Wy Undivd	0.446	0	26	58	23	656424	1082453
1	Lee	Urban 4-5Ln 2Wy Divd Ra	3.12448	234	2503	876	83	208581	212512
1	Lee	Urban 4-5Ln 2Wy Divd Pa	1.80074	41	354	219	24	273200	318362
1	Lee	Urban 4-5Ln 2Wy Undivd	5.05676	36	168	40	5	138064	157836
1	Lee	Suburban 4-5Ln 2Wy Divd	2.21096	471	2399	1298	122	230904	259283
1	Lee	Suburban 4-5Ln 2Wy Divd	1.52661	18	500	339	29	157394	169875
1	Lee	Suburban 4-5Ln 2Wy Und	0	0	0	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Divd Ras	0.73886	3	199	273	38	586538	637056
1	Lee	Rural 4-5Ln 2Wy Divd Pav	0	0	0	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Undivd	0	0	0	0	0	0	0
1	Lee	Urban 6+Ln 2Wy Divd Ras	2.84582	324	3117	1209	81	155904	168539
1	Lee	Urban 6+Ln 2Wy Divd Pav	5.1132	19	1332	264	17	170953	175876
1	Lee	Urban 6+Ln 2Wy Undivd	0	0	0	1	0	0	0
1	Lee	Suburban 6+Ln 2Wy Divd	2.17622	276	4928	2391	134	172005	175905
1	Lee	Suburban 6+Ln 2Wy Divd	0	0	0	0	0	0	0
1	Lee	Suburban 6+Ln 2Wy Undi	0	0	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Rasc	0	0	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Pavc	0	0	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Undivd	0	0	0	0	0	0	0
1	Lee	Urban One Way	3.66094	127	244	101	23	165220	193438
1	Lee	Suburban One Way	2.95697	50	48	33	7	453988	474594
1	Lee	Rural One Way	0	2	0	0	15	95955	114450
1	Lee	Undefined	0	98	158	0	0	220582	221619
1	Lee	Not Coded	1.59981	733	21142	13673	1039	198783	215063

District	County	Crash Rate Category	Total Property Damage Only (	Total Crashes With Highest Injury	Total Crashes With Highest Injury Non Inc	Total Crashes With Highest Injury Inca
1	Lee	Interstate Urban	1616	359	293	98
1	Lee	Interstate Rural	118	19	19	5
1	Lee	Toll Road Urban	0	0	0	0
1	Lee	Toll Road Rural	0	0	0	0
1	Lee	Urban Other Limited Acce	0	0	0	0
1	Lee	Rural Other Limited Acces	0	0	0	0
1	Lee	Ramp Urban	261	82	45	10
1	Lee	Ramp Rural	1097	368	196	57
1	Lee	Urban 2-3Ln 2Wy Divd Ra	154	67	28	4
1	Lee	Urban 2-3Ln 2Wy Divd Pa	257	102	61	25
1	Lee	Urban 2-3Ln 2Wy Undivd	64	19	5	0
1	Lee	Suburban 2-3Ln 2Wy Divd	182	74	38	9
1	Lee	Suburban 2-3Ln 2Wy Divd	463	177	138	53
1	Lee	Suburban 2-3Ln 2Wy Und	255	83	52	24
1	Lee	Rural 2-3Ln 2Wy Divd Ras	0	0	0	0
1	Lee	Rural 2-3Ln 2Wy Divd Pav	15	8	4	1
1	Lee	Rural 2-3Ln 2Wy Undivd	13	3	3	6
1	Lee	Urban 4-5Ln 2Wy Divd Ra	1608	665	325	110
1	Lee	Urban 4-5Ln 2Wy Divd Pa	218	95	57	19
1	Lee	Urban 4-5Ln 2Wy Undivd	103	72	24	4
1	Lee	Suburban 4-5Ln 2Wy Divd	1574	708	432	121
1	Lee	Suburban 4-5Ln 2Wy Divd	285	135	74	21
1	Lee	Suburban 4-5Ln 2Wy Und	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Divd Ras	107	39	31	17
1	Lee	Rural 4-5Ln 2Wy Divd Pav	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Undivd	0	0	0	0
1	Lee	Urban 6+Ln 2Wy Divd Ras	2014	894	410	99
1	Lee	Urban 6+Ln 2Wy Divd Pav	749	383	160	47
1	Lee	Urban 6+Ln 2Wy Undivd	0	0	0	0
1	Lee	Suburban 6+Ln 2Wy Divd	3056	1344	589	173
1	Lee	Suburban 6+Ln 2Wy Divd	0	0	0	0
1	Lee	Suburban 6+Ln 2Wy Undi	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Rasc	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Pavc	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Undivd	0	0	0	0
1	Lee	Urban One Way	207	120	32	6
1	Lee	Suburban One Way	51	21	20	3
1	Lee	Rural One Way	1	0	1	0
1	Lee	Undefined	132	90	24	7
1	Lee	Not Coded	12855	5226	2729	839

District	County	Crash Rate Category	Total Crashes Involving Traffic	Total Crashes With Only Injury Non Tra	Total Non Injured Per:	Total Persons With Possible	Total Persons With Non Incapacitati
1	Lee	Interstate Urban	26	4	4825	676	411
1	Lee	Interstate Rural	2	0	280	38	26
1	Lee	Toll Road Urban	0	0	0	0	0
1	Lee	Toll Road Rural	0	0	0	0	0
1	Lee	Urban Other Limited Acce	0	0	0	0	0
1	Lee	Rural Other Limited Acces	0	0	0	0	0
1	Lee	Ramp Urban	1	0	895	138	64
1	Lee	Ramp Rural	10	2	3916	625	275
1	Lee	Urban 2-3Ln 2Wy Divd Ra	3	0	553	104	41
1	Lee	Urban 2-3Ln 2Wy Divd Pa	0	0	961	201	87
1	Lee	Urban 2-3Ln 2Wy Undivd	0	0	211	23	6
1	Lee	Suburban 2-3Ln 2Wy Divd	1	0	756	122	57
1	Lee	Suburban 2-3Ln 2Wy Divd	11	1	1778	383	233
1	Lee	Suburban 2-3Ln 2Wy Und	9	0	981	175	77
1	Lee	Rural 2-3Ln 2Wy Divd Ras	0	0	0	0	0
1	Lee	Rural 2-3Ln 2Wy Divd Pav	2	0	49	14	8
1	Lee	Rural 2-3Ln 2Wy Undivd	1	0	30	6	9
1	Lee	Urban 4-5Ln 2Wy Divd Ra	29	0	6241	1122	467
1	Lee	Urban 4-5Ln 2Wy Divd Pa	6	0	955	208	87
1	Lee	Urban 4-5Ln 2Wy Undivd	1	0	428	144	38
1	Lee	Suburban 4-5Ln 2Wy Divd	34	1	6275	1204	641
1	Lee	Suburban 4-5Ln 2Wy Divd	3	0	1117	225	102
1	Lee	Suburban 4-5Ln 2Wy Und	0	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Divd Ras	8	0	420	77	51
1	Lee	Rural 4-5Ln 2Wy Divd Pav	0	0	0	0	0
1	Lee	Rural 4-5Ln 2Wy Undivd	0	0	0	0	0
1	Lee	Urban 6+Ln 2Wy Divd Ras	23	1	8030	1479	568
1	Lee	Urban 6+Ln 2Wy Divd Pav	10	2	3208	723	225
1	Lee	Urban 6+Ln 2Wy Undivd	0	0	0	0	0
1	Lee	Suburban 6+Ln 2Wy Divd	41	1	12655	2320	821
1	Lee	Suburban 6+Ln 2Wy Divd	0	0	0	0	0
1	Lee	Suburban 6+Ln 2Wy Undi	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Rasc	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Pavc	0	0	0	0	0
1	Lee	Rural 6+Ln 2Wy Undivd	0	0	0	0	0
1	Lee	Urban One Way	3	3	900	210	50
1	Lee	Suburban One Way	3	0	223	54	29
1	Lee	Rural One Way	0	0	8	1	1
1	Lee	Undefined	3	0	537	160	43
1	Lee	Not Coded	215	11	49510	9223	3929

District	County	Crash Rate Category	Total Persons With Incapacitatin	Total Traffic Fatalit	Total Non Traffic Fatalities
1	Lee	Interstate Urban	133	29	4
1	Lee	Interstate Rural	7	2	0
1	Lee	Toll Road Urban	0	0	0
1	Lee	Toll Road Rural	0	0	0
1	Lee	Urban Other Limited Acce	0	0	0
1	Lee	Rural Other Limited Acces	0	0	0
1	Lee	Ramp Urban	10	1	0
1	Lee	Ramp Rural	64	10	2
1	Lee	Urban 2-3Ln 2Wy Divd Ra	4	3	0
1	Lee	Urban 2-3Ln 2Wy Divd Pa	30	0	0
1	Lee	Urban 2-3Ln 2Wy Undivd	0	0	0
1	Lee	Suburban 2-3Ln 2Wy Divd	14	1	0
1	Lee	Suburban 2-3Ln 2Wy Divd	84	13	1
1	Lee	Suburban 2-3Ln 2Wy Und	48	11	0
1	Lee	Rural 2-3Ln 2Wy Divd Ras	0	0	0
1	Lee	Rural 2-3Ln 2Wy Divd Pav	3	2	0
1	Lee	Rural 2-3Ln 2Wy Undivd	6	2	0
1	Lee	Urban 4-5Ln 2Wy Divd Ra	130	30	1
1	Lee	Urban 4-5Ln 2Wy Divd Pa	27	7	0
1	Lee	Urban 4-5Ln 2Wy Undivd	6	1	0
1	Lee	Suburban 4-5Ln 2Wy Divd	172	39	2
1	Lee	Suburban 4-5Ln 2Wy Divd	30	3	0
1	Lee	Suburban 4-5Ln 2Wy Und	0	0	0
1	Lee	Rural 4-5Ln 2Wy Divd Ras	37	8	0
1	Lee	Rural 4-5Ln 2Wy Divd Pav	0	0	0
1	Lee	Rural 4-5Ln 2Wy Undivd	0	0	0
1	Lee	Urban 6+Ln 2Wy Divd Ras	129	26	1
1	Lee	Urban 6+Ln 2Wy Divd Pav	52	10	2
1	Lee	Urban 6+Ln 2Wy Undivd	0	0	0
1	Lee	Suburban 6+Ln 2Wy Divd	221	41	1
1	Lee	Suburban 6+Ln 2Wy Divd	0	0	0
1	Lee	Suburban 6+Ln 2Wy Undi	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Rasc	0	0	0
1	Lee	Rural 6+Ln 2Wy Divd Pavc	0	0	0
1	Lee	Rural 6+Ln 2Wy Undivd	0	0	0
1	Lee	Urban One Way	6	4	6
1	Lee	Suburban One Way	7	3	0
1	Lee	Rural One Way	0	0	0
1	Lee	Undefined	7	3	0
1	Lee	Not Coded	1131	234	14

Appendix B
HSM Predictive Crash Analysis

In accordance with the Department's ***Highway Safety Manual Implementation Policy (Topic No. 000-500-001)***, "the transportation analyst is encouraged to use the Highway Safety Manual (HSM) methods, where applicable, to measure safety benefits from proposed improvements."

122.6.1 Historical Crash Method (HCM)

This method can be used for sites with a crash history. The historical crash analysis for Design Exceptions and Design Variations includes a review of crashes from within the FDOT Crash Analysis Reporting (CAR) system database and the SIGNAL FOUR ANALYTICS (SFA) system database. Department approval is required for access to the data within these systems and can be obtained through the district offices.

The FDOT CAR system database includes verified crash data for all fatal and serious injury (KA) crashes typically up to the current date and for all crash types (KABCO) up to 2018 (latest completed data set). These crashes should be included in all HCM analyses. The Signal Four database includes all crash types (KABCO) up to the current date and should be used to supplement the crashes reported from the FDOT CAR system database to establish a complete dataset of crashes over the analysis period. Due to the overlap of crash data within the two systems, proper vetting of the dataset is required to ensure that crashes are not duplicated within the analysis.

The B/C (benefit/cost) ratio is the ratio of the estimated annual reduction in crash costs to the estimated annual increase in combined construction and maintenance costs. The annualized conversion will show whether the projected expenditure of funds for the crash benefit will exceed the direct cost for the improvement.

The HCM uses the ***Highway Safety Improvement Program Guideline (HSIPG)*** cost per crash by facility type in ***Table 122.6.1*** to estimate benefit to society, while the cost to society is estimated by the expected cost of right of way, construction, and maintenance.

Table 122.6.1 FDOT Average Crash Costs by Facility Type

Type Facility	Divided Roadway			Undivided Roadway		
	Urban	Suburban	Rural	Urban	Suburban	Rural
2-3 Lanes	$107,732	$201,527	$355,183	$124,618	$267,397	$523,727
4-5 Lanes	$123,406	$225,315	$473,637	$112,896	$190,276	n/a
6+ Lanes	$123,598	$166,258	$451,492	$41,650	n/a	n/a
Interstate	$153,130	n/a	$327,385	n/a	n/a	n/a
Turnpike	$132,199	n/a	$274,012	n/a	n/a	n/a

Notes:

(1) Average Cost/Crash: **$159,093**

(2) The above values were derived from 2014 through 2018 traffic crash and injury severity data for crashes on state roads in Florida using the formulation described in *FHWA Technical Advisory "Motor Vehicle Accident Costs", T7570.2, dated October 31, 1994. Base costs derived* from a memorandum from USDOT: "*Guidance on Treatment of the Economic Value of a Statistical Life (VSL) in the U.S. Department of Transportation Analyses"*, dated August 8, 2016 updating the value of life saved from $9.4 million to $9.6 million for 2015 data with a growth factor applied to increase the base cost to $9.7 million in the current analyses. Costs are computed for the actively state-maintained State Highway System (SHS) only.

(3) Link to ***Revised Departmental Guidance 2013***

When utilizing predictive methods or crash severity distributions for analysis, the following crash severity level costs should be used:

Table 122.6.2 FDOT KABCO Crash Costs

Crash Severity	Comprehensive Crash Cost
Fatal (K)	$10,890,000
Severe Injury (A)	$888,030
Moderate Injury (B)	$180,180
Minor Injury (C)	$103,950
Property Damage Only (O)	$7,700

Note:

(1) Source: Florida Department of Transportation State Safety Office's Crash Analysis Reporting (CAR) System, analysis years 2014 through 2018. Published by FDOT State Safety Office on 11/5/2020.

122.6.2 Roadside Safety Analysis Program (RSAP)

This method complements the ***AASHTO Roadside Design Guide***, dated June 2011. When hazards cannot be removed or relocated, designers need to determine if a safety device, such as a guardrail or a crash cushion, is warranted to protect motorists from the roadside obstacle. This method can be used to perform a benefit/cost analysis comparing a potential safety treatment with the existing or baseline conditions (i.e., the do-nothing option) or alternative safety treatments. Based on the input of information available to the user (e.g., offsets, traffic, slopes, crash history, traffic accident severity levels), the program will offer results which can be used in comparing design alternatives.

122.6.3 Highway Safety Manual

The ***AASHTO Highway Safety Manual (HSM)*** provides analytical tools and techniques for quantifying the potential effects on crashes as a result of decisions made in planning, design, operations, and maintenance. The new techniques and knowledge in the HSM reflect the evolution in safety analysis from descriptive (historical) methods to quantitative, predictive analyses. In the ***HSM***, crash frequency is the fundamental basis for safety analysis and is used to reduce crashes and severities through the selection of alternative treatments.

The ***HSM*** includes Safety Performance Functions (SPFs) for many roadway segment and intersection applications. SPFs are equations used to estimate or predict the expected average crash frequency per year at a location as a function of traffic volume and roadway characteristics. Adjust SPFs to local conditions by applying calibration factors shown in ***Table 122.6.3***. The use of HSMSPF and Crash Modification Factors (CMF), with an Empirical Bayes (EB) adjustment, provides research-based solutions for use in Benefit/Cost comparisons. Crash distributions presented in ***Table 122.6.4*** and KABCO costs as specified in ***Table 122.6.2*** should be used in determining benefits from an ***HSM*** analysis.

Table 122.6.3 HSM Calibration Factors for Florida

Type Facility		Abbreviation	Calibration Factor (Cx)
FDOT Roadway Calibration Factors			
Rural	2-lane Undivided	R2U	1.00
	4-lane Divided	R4D	0.68
Urban	2-lane Undivided	U2U	1.02
	3-lane with a Center Two-Way Left Turn Lane	U32LT	1.04
	4-lane Undivided	U4U	0.73
	4-lane Divided	U4D	1.63
	5-lane with a Center Two-Way Left Turn Lane	U52LT	0.70
FDOT Intersection Calibration Factors			
Rural	2-lane 3-Leg Stop-Controlled	RTL3ST	1.27
	2-lane 4-Leg Stop-Controlled	RTL4ST	0.74
	2-lane 4-Leg Signalized	RTL4SG	0.92
	Multilane 3-Leg Stop-Controlled	RML3ST	2.20
	Multilane 4-Leg Stop-Controlled	RML4ST	1.64
	Multilane 4-Leg Signalized	RML4SG	0.45
Urban	3-Leg Stop-Controlled Intersection	USA3ST	1.14
	4-Leg Stop-Controlled Intersection	USA4ST	1.87
	3-Leg Signalized w/o Ped. CMFs	USA3SG w/o Ped.	2.58
	3-Leg Signalized w/ Ped. CMFs	USA3SG w/ Ped.	2.50
	4-Leg Signalized	USA4SG	2.27

Table 122.6.4 HSM Crash Distribution for Florida

Type Facility		Abbreviation	K	A	B	C	O
Rural Roadways	2-lane Undivided	R2U	0.028	0.094	0.181	0.187	0.509
	4-lane Undivided	R4U	0.033	0.093	0.164	0.186	0.524
	4-lane Divided	R4D	0.028	0.090	0.187	0.196	0.499
Urban & Suburban Arterials	2-lane Undivided	U2U	0.009	0.050	0.150	0.224	0.567
	3-lane TWLTL	U32LT	N/A				
	4-lane Undivided	U4U	0.004	0.031	0.110	0.204	0.650
	4-lane Divided	U4D	0.008	0.046	0.142	0.234	0.571
	5-lane TWLTL	U52LT	N/A				
Freeways	Rural		0.017	0.065	0.143	0.163	0.612
	Urban		0.006	0.035	0.113	0.206	0.641
	Ramps		0.004	0.032	0.107	0.210	0.647
All	All Roadways and Ramps		0.007	0.041	0.124	0.217	0.611

Notes:
K – Fatality
A - Incapacitating Injury
B - Non-incapacitating Injury
C - Possible (or minor) Injury
O - Property Damage Only

Data Source: Florida Department of Transportation, State Safety Office's Crash Analysis Reporting (CAR) database, analysis years 2014 through 2018. Publishing by FDOT State Safety Office on 11/5/2020.

Tools and spreadsheets for use with these analytical methods have been developed and are available on the following websites:

https://safety.fhwa.dot.gov/rsdp/hsm.aspx

https://www.fdot.gov/roadway/QA/Tools.shtm

122.7 Design Approval Request

122.7.1 Submittal Package

The submittal package for a Design Exception or a Design Variation will include the same items. However, the required documentation and necessary level of detail will vary depending on the design element being evaluated (as described in ***FDM 122.4***). The Design Exception or Design Variation submittal package is to include the following items:

(1) Submittal/Approval Letter (cover letter): ***Form 122-A*** (see ***FDM 103***).

(2) Signed and Sealed Report: The signed and sealed documents including all required documentation and justification (see ***FDM 122.4*** for documentation requirements). Multiple design elements and signed and sealed reports may be included in one submittal package.

(3) Appendices (as needed): Include any support documentation to facilitate an understanding of the report. Supplemental documents do not alter the sealed analysis or design.

Sign and seal the report in accordance with ***FDM 130***. A Submittal/Approval Letter (***Form 122–A,*** see ***FDM 103***) is to be attached to the Signed and Sealed Report and submitted to the District or Turnpike Design Engineer. The District or Turnpike Design Engineer then approves or denies the request and notifies the Responsible Engineer. When further approvals are required, the District or Turnpike Design Engineer will forward the Submittal/Approval Letter and Sealed Report to the State Roadway Design Office.

122.7.2 Design Exception Approval

The request will be reviewed by the State Roadway Design Engineer and may be forwarded for approval to the Chief Engineer, the State Structures Design Engineer, the Planning Office, and FHWA, as appropriate.

Each request will be reviewed on a case-by-case basis and approved on its merits. When approval is obtained, the State Roadway Design Office will email the disposition to the District or Turnpike Design Engineer along with the signed Submittal/Approval Letter. The State Roadway Design Office will keep an electronic copy filed under the assigned reference number.

When a request is denied, the State Roadway Design Office will notify the District or Turnpike Design Engineer of the disposition. Denied requests can be resubmitted when all deficiencies, noted in the denial notification, have been addressed. This may require only a new Submittal/Approval Letter if the Sealed Report does not need to be amended; however, if the Sealed Report requires revision, a new Sealed Report and attached Submittal/Approval Letter must be submitted.

Documentation requirements for Design Exceptions are in ***FDM 122.4***.

122.7.3 Design Variation Approval

Design Variations are typically approved at the District level; however, there are specific elements requiring Central Office approval noted in ***FDM 122.7.4*** (see ***Table 122.7.1***). Design Variations requiring Central Office approval must follow the processes in ***FDM 122.7.2***.

Design Variations approved at the District level may be submitted as either a Formal Design Variation or a Design Variation Memorandum for approval by the District or Turnpike Enterprise Design Engineer.

Documentation requirements for Design Variations (both Formal and Memorandums) are in ***FDM 122.4***.

122.7.4 Signature Requirements

Obtain all required approvals as described in this section. Approvals from multiple individuals may be required for certain issues. The Director of Design must resolve any approval authority issues if conflicting objectives arise. Approval signatures are required by the following Department and FHWA personnel as specified:

Chief Engineer:

(1) Design Exceptions for Design Speed on SIS facilities, following review by the Chief Planner.

(2) Design Variations for Design Speed on SIS facilities, following review by the Chief Planner.

(3) Design Variations for omission of Emergency Shoulder Use (ESU) evacuation requirements for any phase of construction.

(4) Design Variation for Shared Use Paths in LA R/W not meeting the criteria in ***FDM 224.1.1***, following review by the Chief Planner.

(5) Design Exceptions or Variations involving lateral offsets or vertical clearances for railroads not meeting the requirements of ***Rule 14-57 F.A.C***. or the clearance

criteria for the South Florida Rail Corridor (***Topic No. 000-725-003 - South Florida Rail Corridor Clearance Policy for 25 KV service***).

(6) Design Variations for Non-Standard Use of Shoulders. (e.g., Bus on Shoulder Projects, Part-Time Shoulder Use, Hard Shoulder Running, etc.)

(7) Design Exceptions for Paved Shoulder Width on Interstate and Turnpike Facilities.

(8) Design Variations to not install a Railroad Dynamic Envelope (RDE).

FHWA Division Administrator:

(1) Design Exceptions on Projects of Division Interest (PoDIs).

District (or Turnpike) Design Engineer:

(1) Design Exceptions

(2) Design Variations

State Roadway Design Engineer:

(1) Design Exceptions for elements other than Design Loading Structural Capacity.

(2) Design Variations involving the use of fencing around stormwater management facilities.

(3) Design Exceptions or Variations involving lateral offsets or vertical clearances for railroads not meeting the requirements of ***Rule 14-57 F.A.C***. or the clearance criteria for the South Florida Rail Corridor (***Topic No. 000-725-003 - South Florida Rail Corridor Clearance Policy for 25 KV service***).

State Structures Design Engineer:

(1) Design Exceptions for Design Loading Structural Capacity of bridges and Vertical Clearance impacting Category 1 and 2 bridge structures.

(2) Design Variations for Design Loading Structural Capacity of bridges and Vertical Clearance impacting Category 2 structures.

(3) Design Variations for Design Loading Structural Capacity due to deficient load ratings impacting both Category 1 and 2 bridge structures.

(4) Design Variations for Traffic Railing impacting Category 1 and 2 bridge structures.

(5) Design Exceptions or Variations involving lateral offsets or vertical clearances for railroads not meeting the requirements of ***Rule 14-57 F.A.C***. or the clearance criteria for the South Florida Rail Corridor (***Topic No. 000-725-003 - South Florida Rail Corridor Clearance Policy for 25 KV service***).

District (or Turnpike) Structures Design Engineer:

(1) Design Exceptions for Design Loading Structural Capacity of all structural items and Vertical Clearance impacting Category 1 and 2 bridge structures.

(2) Design Variations for Design Loading Structural Capacity of all structural items and Vertical Clearance impacting Category 1 bridge structures.

Table 122.7.1 Central Office Approvals

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Design Speed Exception	X			
Design Speed Exception-SIS	X		X	X
Design Speed Variation-SIS			X	X
Design Variation: ESU Omission during Construction				X
Design Variation: Shared Use Path in LA R/W			X	X
Design Variation: Non-Standard Shoulder Use				X
Design Variations to not install an RDE				X
Lane Width Exception	X			
Shoulder Width Exception	X			
Paved Shoulder Width Exception (Interstate and Turnpike)	X			X
Maximum Grade Exception	X			
Cross Slope Exception	X			
Superelevation Rate Exception	X			
Horizontal Curve Radius Exception	X			
Stopping Sight Distance Exception	X			
Design Variation: Traffic Railing (Category 1 and 2 Structures)		X		
Design Variation: Fencing on Traffic Railing between pedestrians and travel lanes on LA Facilities		X		
Design Variation: Crossovers on Limited Access Facilities	X			
Design Variation: Patterned Pavement Technical Special Provisions	X			
Design Variation: Use of fencing around stormwater management facilities	X			

Table 122.7.1 Central Office Approvals (Cont.)

Design Element	State Roadway Design Engineer	State Structures Design Engineer	Chief Planner	Chief Engineer
	Approval	Approval	Review	Approval
Design Loading Structural Capacity				
-Design Exception for Bridges		X		
-Design Variation: Category 2 Structures		X		
-Design Variation: Deficient Load Ratings (Category 1 and 2 Structures)		X		
Vertical Clearance Exception				
- Non-Bridge Items	X			
- Bridge Structures (Category 1 and 2)	X	X		
-RR-South Fla Rail Corridor	X	X		X
Vertical Clearance Variation				
-Category 2 Structures		X		
-RR-South Fla Rail Corridor	X	X		X
Lateral Offset Variation				
-Category 1 and 2 Structures	X			
-RR-South Fla Rail Corridor	X	X		X

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments			
General Information		**Location Information**	
Analyst		Roadway	SR 31
Agency or Company	AECOM	Roadway Section	LJ's Lounge Driveway to south of SR 78
Date Performed	10/27/22	Jurisdiction	Lee County
		Analysis Year	2025
Input Data		**Base Conditions**	**Site Conditions**
Roadway type (2U, 3T, 4U, 4D, ST)		--	2U
Length of segment, L (mi)		--	0.84
AADT (veh/day)	$AADT_{MAX}$ = 32,600 (veh/day)	--	27,000
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)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	2
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	0
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.02

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	5.707	1.000	5.707	1.00	1.02	5.821
Fatal and Injury (FI)	-16.22	1.66	0.65	1.712	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.288	1.642	1.00	1.02	1.675
Property Damage Only (PDO)	-15.62	1.69	0.87	4.237	$(5)_{TOTAL}-(5)_{FI}$ 0.712	4.065	1.00	1.02	4.146

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	1.675	1.000	4.146	5.821
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Rear-end collision	0.730	1.223	0.778	3.226	4.449
Head-on collision	0.068	0.114	0.004	0.017	0.131
Angle collision	0.085	0.142	0.079	0.328	0.470
Sideswipe, same direction	0.015	0.025	0.031	0.129	0.154
Sideswipe, opposite direction	0.073	0.122	0.055	0.228	0.350
Other multiple-vehicle collision	0.029	0.049	0.053	0.220	0.268

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	1.066	1.000	1.066	1.00	1.02	1.087
Fatal and Injury (FI)	-3.96	0.23	0.50	0.166	(4)$_{FI}$/((4)$_{FI}$+(4)$_{PDO}$) 0.163	0.174	1.00	1.02	0.178
Property Damage Only (PDO)	-6.51	0.64	0.87	0.852	(5)$_{TOTAL}$-(5)$_{FI}$ 0.837	0.892	1.00	1.02	0.909

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	0.178	1.000	0.909	1.087
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with animal	0.026	0.005	0.066	0.060	0.065
Collision with fixed object	0.723	0.128	0.759	0.690	0.819
Collision with other object	0.010	0.002	0.013	0.012	0.014
Other single-vehicle collision	0.241	0.043	0.162	0.147	0.190

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	0	0.158	1.000	0.000	--
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	2	0.025	1.000	0.090	
Total	--	--	--	0.090	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	0.090	1.000	0.090	1.00	1.02	0.092
Fatal and injury (FI)	--	0.323	0.029	1.00	1.02	0.030
Property damage only (PDO)	--	0.677	0.061	1.00	1.02	0.062

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	5.821	1.087	0.092	7.000	0.005	1.02	0.035
Fatal and injury (FI)	--	--	--	--	--	1.02	0.035

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	5.821	1.087	0.092	7.000	0.004	1.02	0.028
Fatal and injury (FI)	--	--	--	--	--	1.02	0.028

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)	1.223	3.226	4.449
Head-on collisions (from Worksheet 1D)	0.114	0.017	0.131
Angle collisions (from Worksheet 1D)	0.142	0.328	0.470
Sideswipe, same direction (from Worksheet 1D)	0.025	0.129	0.154
Sideswipe, opposite direction (from Worksheet 1D)	0.122	0.228	0.350
Driveway-related collisions (from Worksheet 1H)	0.030	0.062	0.092
Other multiple-vehicle collision (from Worksheet 1D)	0.049	0.220	0.268
Subtotal	1.705	4.208	5.913
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.005	0.060	0.065
Collision with fixed object (from Worksheet 1F)	0.128	0.690	0.819
Collision with other object (from Worksheet 1F)	0.002	0.012	0.014
Other single-vehicle collision (from Worksheet 1F)	0.043	0.147	0.190
Collision with pedestrian (from Worksheet 1I)	0.035	0.000	0.035
Collision with bicycle (from Worksheet 1J)	0.028	0.000	0.028
Subtotal	0.241	0.909	1.150
Total	1.946	5.118	7.063

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	7.1	0.84	8.5
Fatal and injury (FI)	1.9	0.84	2.3
Property damage only (PDO)	5.1	0.84	6.1

Form 750-020-21-c
TRAFFIC ENGINEERING
10/15

Urban/Suburban Arterial - 2 Lane Undivided
No-Build Alternative

General Information				Site Information			
Analyst:		**Date:**	10/27/2022	**Location ID:**	SR 31_LJ's Lounge Driveway to south of SR 78	**County:**	Osceola
Agency or Company:			AECOM	**City:**	Fort Mayers	**M.P. - M.P.**	

Manual Input from Analysis

Growth Rate =	3.9%	**Current Year =**	2025	**Project Opening Year =**	2025
Current Year AADT =	27,000	**Rate of Return =**	4.0%	**Analysis Period =**	21
Segment Length =	0.835	**Segment Type =**	2U		Analyze
Crash Data Used =	No	**Segment =**	Segment1		

Default Distribution for Crash Severity Level (2010-2014 Florida HSM Crash Distribution)

Fatality =	0.9%	**Possible Injury =**	22.4%
Incapacitating =	5.0%	**Property Damage Only =**	56.7%
Non-Incapacitating =	15.0%		100.0%

	Year	AADT	Annual Number of Crashes						Annual Cost						
			Site Specific ($N_{predicted / expected}$)	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Total Cost	Present Value
1	2025	27,000	7.0	0.063	0.349	1.048	1.565	3.960	$684,597	$310,143	$188,783	$162,644	$30,496	$1,376,661	$1,323,713
2	2026	28,048	7.4	0.067	0.370	1.109	1.657	4.193	$724,799	$328,356	$199,869	$172,195	$32,286	$1,457,504	$1,347,545
3	2027	29,136	7.8	0.070	0.392	1.175	1.754	4.440	$767,544	$347,721	$211,656	$182,350	$34,191	$1,543,460	$1,372,131
4	2028	30,266	8.3	0.075	0.415	1.244	1.858	4.703	$812,997	$368,312	$224,190	$193,148	$36,215	$1,634,862	$1,397,487
5	2029	31,441	8.8	0.079	0.439	1.318	1.969	4.983	$861,334	$390,210	$237,519	$204,632	$38,369	$1,732,065	$1,423,631
6	2030	32,661	9.3	0.084	0.466	1.397	2.086	5.280	$912,744	$413,501	$251,696	$216,846	$40,659	$1,835,445	$1,450,579
7	2031	33,928	9.9	0.089	0.494	1.481	2.211	5.597	$967,426	$438,273	$266,775	$229,837	$43,094	$1,945,405	$1,478,348
8	2032	35,244	10.5	0.094	0.523	1.570	2.344	5.933	$1,025,593	$464,625	$282,815	$243,656	$45,686	$2,062,374	$1,506,957
9	2033	36,612	11.1	0.100	0.555	1.664	2.485	6.291	$1,087,473	$492,658	$299,879	$258,357	$48,442	$2,186,810	$1,536,423
10	2034	38,032	11.8	0.106	0.588	1.765	2.636	6.672	$1,153,308	$522,484	$318,034	$273,998	$51,375	$2,319,198	$1,566,767
11	2035	39,508	12.5	0.112	0.624	1.872	2.796	7.077	$1,223,357	$554,218	$337,350	$290,640	$54,495	$2,460,059	$1,598,007
12	2036	41,041	13.2	0.119	0.662	1.986	2.966	7.508	$1,297,893	$587,985	$357,904	$308,348	$57,815	$2,609,945	$1,630,164
13	2037	42,633	14.1	0.126	0.703	2.108	3.148	7.967	$1,377,211	$623,918	$379,776	$327,192	$61,349	$2,769,447	$1,663,258
14	2038	44,287	14.9	0.134	0.746	2.237	3.341	8.456	$1,461,623	$662,160	$403,054	$347,246	$65,109	$2,939,192	$1,697,310
15	2039	46,006	15.8	0.142	0.791	2.374	3.546	8.975	$1,551,462	$702,859	$427,827	$368,590	$69,111	$3,119,850	$1,732,342
16	2040	47,791	16.8	0.151	0.840	2.521	3.764	9.529	$1,647,083	$746,179	$454,196	$391,307	$73,370	$3,312,135	$1,768,376
17	2041	49,645	17.8	0.161	0.892	2.677	3.997	10.117	$1,748,865	$792,289	$482,263	$415,488	$77,904	$3,516,808	$1,805,435
18	2042	51,571	18.9	0.171	0.947	2.842	4.245	10.744	$1,857,210	$841,372	$512,140	$441,228	$82,730	$3,734,680	$1,843,543
19	2043	53,572	20.1	0.181	1.006	3.019	4.508	11.411	$1,972,548	$893,624	$543,945	$468,629	$87,868	$3,966,614	$1,882,723
20	2044	55,651	21.4	0.192	1.069	3.207	4.789	12.122	$2,095,337	$949,251	$577,805	$497,801	$93,338	$4,213,532	$1,923,001
21	2045	57,810	22.7	0.204	1.136	3.407	5.088	12.878	$2,226,066	$1,008,475	$613,855	$528,859	$99,161	$4,476,416	$1,964,402
	2046	60,053		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2047	62,383		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2048	64,803		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2049	67,318		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2050	69,930		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2051	72,643		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	Shaded cell indicates the		280.1											**Total Present Value**	**$33,912,142**

NOTES:

1. Present Value = Future Cash Flow / (1 + Required Rate of Return)$^{\text{Number of Years You Have To Wait For The Cash Flow}}$
2. Traffic Growth Rate = $[((ADT_f / ADT_i)^{(1/(F-I))})-1] \times 100$

   where ADT_f = Average Daily Traffic for Future Year

   ADT_i = Average Daily Traffic for Initial Year

   I = Initial Year for ADT

   F = Future Year for ADT

3. Column E(Site Specific (Npredicted / expected)) is updated based on manually updating AADT within the copy of the spreadsheet and get copy the crash rate for each year here.

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		**Location Information**	
Analyst		Roadway	SR 31
Agency or Company	AECOM	Intersection	Marina Dr and SR 31
Date Performed	10/27/22	Jurisdiction	Lee County
		Analysis Year	2025

Input Data		**Base Conditions**	**Site Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 45,700 (veh/day)	--	27,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 9,300 (veh/day)	--	1,900
Intersection lighting (present/not present)		Not Present	Not Present
Calibration factor, C_i		1.00	1.14
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	1
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
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	0
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]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not 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			
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	3
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	0
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	0

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)
0.67	1.00	0.86	1.00	1.00	1.00	0.58

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	-13.36	1.11	0.41	0.80	2.890	1.000	2.890	0.58	1.14	1.898
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	1.095	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.349	1.009	0.58	1.14	0.663
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	2.043	$(5)_{TOTAL}-(5)_{FI}$ 0.651	1.882	0.58	1.14	1.236

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	0.663	1.000	1.236	1.898
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.279	0.440	0.544	0.823
Head-on collision	0.045	0.030	0.023	0.028	0.058
Angle collision	0.343	0.227	0.262	0.324	0.551
Sideswipe	0.126	0.083	0.040	0.049	0.133
Other multiple-vehicle collision	0.065	0.043	0.235	0.290	0.334

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	-6.81	0.16	0.51	1.14	0.265	1.000	0.265	0.58	1.14	0.174
Fatal and Injury (FI)	--	--	--	--	0.082	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.301	0.080	0.58	1.14	0.052
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.191	$(5)_{TOTAL}-(5)_{FI}$ 0.699	0.185	0.58	1.14	0.122

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	0.052	1.000	0.122	0.174
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.002	0.002
Collision with fixed object	0.762	0.040	0.834	0.102	0.142
Collision with other object	0.090	0.005	0.092	0.011	0.016
Other single-vehicle collision	0.039	0.002	0.023	0.003	0.005
Single-vehicle noncollision	0.105	0.006	0.030	0.004	0.009

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	1.898	0.174	2.073	0.021	1.14	0.050
Fatal and injury (FI)	--	--	--	--	1.14	0.050

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)
--	--	--	--

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	--	--	--	--	--	--	--	--	1.14	1.140
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.14	1.140

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	1.898	0.174	2.073	0.016	1.14	0.033
Fatal and injury (FI)	--	--	--	--	1.14	0.033

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)	0.279	0.544	0.823
Head-on collisions (from Worksheet 2D)	0.030	0.028	0.058
Angle collisions (from Worksheet 2D)	0.227	0.324	0.551
Sideswipe (from Worksheet 2D)	0.083	0.049	0.133
Other multiple-vehicle collision (from Worksheet 2D)	0.043	0.290	0.334
Subtotal	0.663	1.236	1.898
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.002	0.002
Collision with fixed object (from Worksheet 2F)	0.040	0.102	0.142
Collision with other object (from Worksheet 2F)	0.005	0.011	0.016
Other single-vehicle collision (from Worksheet 2F)	0.002	0.003	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.006	0.004	0.009
Collision with pedestrian (from Worksheet 2G or 2I)	0.050	0.000	0.050
Collision with bicycle (from Worksheet 2J)	0.033	0.000	0.033
Subtotal	0.135	0.122	0.257
Total	0.798	1.358	2.156

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	2.2
Fatal and injury (FI)	0.8
Property damage only (PDO)	1.4

Present Worth Analysis
Urban/Suburban Arterial - Unsignalised 3 Leg Intersection
No-Build Alternative

General Information				Site Information			
Analyst:		Date:	10/27/2022	Location ID:	Marina Dr and SR 31	County:	Lee County
Agency or Company:			AECOM	City:	Fort Mayers	M.P. - M.P.	

Manual Input from Analysis

Major Growth Rate =	3.9%	Current Year =	2025	roject Opening Year =	2025
Minor Growth Rate =	1.0%	Rate of Return =	4.0%	Analysis Period =	21
Current Year Major AADT =	27,000	Intersection Type =	3ST		
Current Year Minor AADT =	1,900	Intersection =	Intersection1	Analyze	
		Crash Data Used =	No		

Default Distribution for Crash Severity Level (2010-2014 Florida HSM Crash Distribution)

Fatality =	0.9%	Possible Injury =	22.4%
Incapacitating =	5.0%	Property Damage Only =	56.7%
Non-Incapacitating =	15.0%	Segment Type =	2U
			100.0%

	Year	Major AADT	Minor AADT	Annual Number of Crashes						Annual Cost						
					Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Total Cost	Present Value
1	2025	27,000	1,900	2.2	0.019	0.108	0.324	0.484	1.225	$211,732	$95,921	$58,387	$50,302	$9,432	$425,774	$409,398
2	2026	28,053	1,919	2.3	0.020	0.113	0.338	0.505	1.279	$221,159	$100,192	$60,986	$52,542	$9,852	$444,731	$411,178
3	2027	29,147	1,938	2.4	0.021	0.118	0.354	0.528	1.337	$231,028	$104,663	$63,708	$54,887	$10,291	$464,576	$413,006
4	2028	30,284	1,958	2.5	0.022	0.123	0.369	0.552	1.396	$241,359	$109,343	$66,557	$57,341	$10,751	$485,351	$414,880
5	2029	31,465	1,977	2.6	0.023	0.129	0.386	0.576	1.459	$252,175	$114,243	$69,539	$59,911	$11,233	$507,102	$416,801
6	2030	32,692	1,997	2.7	0.024	0.134	0.403	0.602	1.524	$263,499	$119,373	$72,662	$62,601	$11,738	$529,873	$418,766
7	2031	33,967	2,017	2.8	0.025	0.140	0.421	0.629	1.593	$275,355	$124,744	$75,931	$65,418	$12,266	$553,713	$420,776
8	2032	35,292	2,037	2.9	0.026	0.147	0.440	0.658	1.665	$287,767	$130,367	$79,354	$68,366	$12,819	$578,674	$422,831
9	2033	36,668	2,057	3.1	0.028	0.153	0.460	0.687	1.740	$300,763	$136,255	$82,938	$71,454	$13,398	$604,807	$424,930
10	2034	38,098	2,078	3.2	0.029	0.160	0.481	0.718	1.819	$314,370	$142,419	$86,690	$74,687	$14,004	$632,170	$427,071
11	2035	39,584	2,099	3.4	0.030	0.168	0.503	0.751	1.901	$328,618	$148,874	$90,619	$78,072	$14,638	$660,820	$429,256
12	2036	41,128	2,120	3.5	0.032	0.175	0.526	0.785	1.987	$343,536	$155,632	$94,733	$81,616	$15,303	$690,819	$431,483
13	2037	42,732	2,141	3.7	0.033	0.183	0.550	0.821	2.078	$359,156	$162,709	$99,040	$85,327	$15,999	$722,230	$433,753
14	2038	44,398	2,162	3.8	0.034	0.192	0.575	0.858	2.172	$375,512	$170,118	$103,550	$89,213	$16,727	$755,121	$436,064
15	2039	46,130	2,184	4.0	0.036	0.200	0.601	0.897	2.271	$392,639	$177,878	$108,273	$93,282	$17,490	$789,562	$438,416
16	2040	47,929	2,206	4.2	0.038	0.209	0.628	0.938	2.375	$410,574	$186,002	$113,219	$97,542	$18,289	$825,627	$440,809
17	2041	49,798	2,228	4.4	0.039	0.219	0.657	0.981	2.484	$429,354	$194,510	$118,398	$102,004	$19,126	$863,392	$443,243
18	2042	51,740	2,250	4.6	0.041	0.229	0.687	1.026	2.598	$449,021	$203,420	$123,821	$106,676	$20,002	$902,940	$445,716
19	2043	53,758	2,273	4.8	0.043	0.240	0.719	1.073	2.717	$469,615	$212,750	$129,500	$111,569	$20,919	$944,353	$448,230
20	2044	55,855	2,295	5.0	0.045	0.251	0.752	1.123	2.842	$491,182	$222,520	$135,447	$116,693	$21,880	$987,722	$450,783
21	2045	58,033	2,318	5.2	0.047	0.262	0.786	1.174	2.972	$513,767	$232,752	$141,675	$122,059	$22,886	$1,033,139	$453,376
	2046	60,296	2,342		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2047	62,648	2,365		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2048	65,091	2,389		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2049	67,630	2,412		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2050	70,267	2,437		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2051	73,008	2,461		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	Shaded cell indicates the AADT is ou			73.1											Total Present Value	$9,030,767

NOTES:

1. Present Value = Future Cash Flow / (1 + Required Rate of Return)$^{\text{Number of Years You Have To Wait For The Cash Flow}}$
2. Traffic Growth Rate = $[((ADT_f / ADT_i)^{(1/(F-I))}-1] \times 100$

   where ADT_f = Average Daily Traffic for Future Year

   ADT_i = Average Daily Traffic for Initial Year

   I = Initial Year for ADT

   F = Future Year for ADT
3. Column F(Site Specific (Npredicted / expected)) is updated based on manually updating AADT within the copy of the spreadsheet and get copy the crash rate for each year here.

Note: Build Alternative: AADTs was adjusted to 4 -lane from 6-lane segment by reducing 33% (Build Option 2: 29,500 *33% = 19,700)

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments			
General Information		**Location Information**	
Analyst		Roadway	SR 31
Agency or Company	AECOM	Roadway Section	LJ's Lounge Driveway to south of SR 78
Date Performed	10/27/22	Jurisdiction	Lee County
		Analysis Year	2025
Input Data		**Base Conditions**	**Site Conditions**
Roadway type (2U, 3T, 4U, 4D, ST)		--	4D
Length of segment, L (mi)		--	0.84
AADT (veh/day)	$AADT_{MAX}$ = 66,000 (veh/day)	--	19,700
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	20
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	4
Other driveways (number)		--	0
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	0
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.63

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	0.99	0.91	1.00	0.90

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	-12.34	1.36	1.32	2.529	1.000	2.529	0.90	1.63	3.730
Fatal and Injury (FI)	-12.76	1.28	1.31	0.753	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.281	0.711	0.90	1.63	1.049
Property Damage Only (PDO)	-12.81	1.38	1.34	1.926	$(5)_{TOTAL}-(5)_{FI}$ 0.719	1.818	0.90	1.63	2.681

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	1.049	1.000	2.681	3.730
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.832	0.872	0.662	1.775	2.647
Head-on collision	0.020	0.021	0.007	0.019	0.040
Angle collision	0.040	0.042	0.036	0.097	0.138
Sideswipe, same direction	0.050	0.052	0.223	0.598	0.650
Sideswipe, opposite direction	0.010	0.010	0.001	0.003	0.013
Other multiple-vehicle collision	0.048	0.050	0.071	0.190	0.241

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	-5.05	0.47	0.86	0.558	1.000	0.558	0.90	1.63	0.823
Fatal and Injury (FI)	-8.71	0.66	0.28	0.094	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.169	0.094	0.90	1.63	0.139
Property Damage Only (PDO)	-5.04	0.45	1.06	0.463	$(5)_{TOTAL}-(5)_{FI}$ 0.831	0.464	0.90	1.63	0.684

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	0.139	1.000	0.684	0.823
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.063	0.043	0.043
Collision with fixed object	0.500	0.070	0.813	0.556	0.626
Collision with other object	0.028	0.004	0.016	0.011	0.015
Other single-vehicle collision	0.471	0.066	0.108	0.074	0.139

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	0	0.033	1.106	0.000	--
Minor commercial	0	0.011	1.106	0.000	
Major industrial/institutional	0	0.036	1.106	0.000	
Minor industrial/institutional	0	0.005	1.106	0.000	
Major residential	0	0.018	1.106	0.000	
Minor residential	4	0.003	1.106	0.016	
Other	0	0.005	1.106	0.000	
Total	--	--	--	0.016	1.39

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	0.016	1.000	0.016	0.90	1.63	0.024
Fatal and injury (FI)	--	0.284	0.005	0.90	1.63	0.007
Property damage only (PDO)	--	0.716	0.012	0.90	1.63	0.017

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	3.730	0.823	0.024	4.577	0.019	1.63	0.087
Fatal and injury (FI)	--	--	--	--	--	1.63	0.087

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	3.730	0.823	0.024	4.577	0.005	1.63	0.023
Fatal and injury (FI)	--	--	--	--	--	1.63	0.023

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)	0.872	1.775	2.647
Head-on collisions (from Worksheet 1D)	0.021	0.019	0.040
Angle collisions (from Worksheet 1D)	0.042	0.097	0.138
Sideswipe, same direction (from Worksheet 1D)	0.052	0.598	0.650
Sideswipe, opposite direction (from Worksheet 1D)	0.010	0.003	0.013
Driveway-related collisions (from Worksheet 1H)	0.007	0.017	0.024
Other multiple-vehicle collision (from Worksheet 1D)	0.050	0.190	0.241
Subtotal	1.055	2.698	3.754
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.043	0.043
Collision with fixed object (from Worksheet 1F)	0.070	0.556	0.626
Collision with other object (from Worksheet 1F)	0.004	0.011	0.015
Other single-vehicle collision (from Worksheet 1F)	0.066	0.074	0.139
Collision with pedestrian (from Worksheet 1I)	0.087	0.000	0.087
Collision with bicycle (from Worksheet 1J)	0.023	0.000	0.023
Subtotal	0.249	0.684	0.933
Total	1.304	3.383	4.687

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	4.7	0.84	5.6
Fatal and injury (FI)	1.3	0.84	1.6
Property damage only (PDO)	3.4	0.84	4.1

Present Worth Analysis
Urban/Suburban Arterial - 4 Lane Divided
Build Alternative

General Information				Site Information			
Analyst:		Date:	10/27/2022	Location ID:	SR 31_LJ's Lounge Driveway to south of SR 78	County:	Lee County
Agency or Company:			AECOM	City:		M.P. - M.P.	

Manual Input from Analysis

Growth Rate =	3.6%	Current Year =	2025	Project Opening Year =	2025
Current Year AADT =	19,700	Rate of Return =	4.0%	Analysis Period =	21
Segment Length =	0.835	Segment Type =	4D		Analyze
Crash Data Used =	No	Segment =	Segment1		

Default Distribution for Crash Severity Level (2010-2014 Florida HSM Crash Distribution)

Fatality =	0.8%	Possible Injury =	23.4%
Incapacitating =	4.6%	Property Damage Only =	57.1%
Non-Incapacitating =	14.2%		100.1%

	Year	AADT	Annual Number of Crashes						Annual Cost						
			Site Specific ($N_{predicted / expected}$)	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Total Cost	Present Value
1	2025	19,700	4.7	0.037	0.216	0.666	1.097	2.676	$408,325	$191,458	$119,918	$114,006	$20,607	$854,315	$821,456
2	2026	20,411	4.9	0.039	0.225	0.694	1.144	2.793	$426,087	$199,786	$125,134	$118,965	$21,503	$891,476	$824,219
3	2027	21,148	5.1	0.041	0.235	0.725	1.194	2.915	$444,685	$208,507	$130,596	$124,158	$22,442	$930,387	$827,110
4	2028	21,911	5.3	0.043	0.245	0.757	1.247	3.042	$464,160	$217,638	$136,315	$129,595	$23,425	$971,133	$830,129
5	2029	22,702	5.6	0.044	0.256	0.790	1.301	3.176	$484,555	$227,201	$142,305	$135,290	$24,454	$1,013,804	$833,273
6	2030	23,522	5.8	0.046	0.267	0.825	1.359	3.316	$505,914	$237,216	$148,578	$141,253	$25,532	$1,058,493	$836,543
7	2031	24,371	6.1	0.049	0.279	0.861	1.419	3.462	$528,285	$247,706	$155,148	$147,500	$26,661	$1,105,299	$839,936
8	2032	25,251	6.3	0.051	0.291	0.899	1.482	3.616	$551,716	$258,692	$162,029	$154,042	$27,844	$1,154,323	$843,453
9	2033	26,163	6.6	0.053	0.304	0.939	1.548	3.777	$576,260	$270,201	$169,237	$160,894	$29,082	$1,205,675	$847,091
10	2034	27,107	6.9	0.055	0.318	0.981	1.617	3.945	$601,971	$282,256	$176,788	$168,073	$30,380	$1,259,467	$850,851
11	2035	28,086	7.2	0.058	0.332	1.025	1.689	4.122	$628,904	$294,885	$184,698	$175,593	$31,739	$1,315,819	$854,731
12	2036	29,099	7.5	0.060	0.347	1.071	1.765	4.307	$657,121	$308,115	$192,984	$183,471	$33,163	$1,374,855	$858,730
13	2037	30,150	7.9	0.063	0.363	1.119	1.844	4.501	$686,683	$321,976	$201,666	$191,725	$34,655	$1,436,706	$862,848
14	2038	31,238	8.2	0.066	0.379	1.170	1.928	4.704	$717,656	$336,499	$210,763	$200,373	$36,218	$1,501,509	$867,084
15	2039	32,366	8.6	0.069	0.396	1.223	2.015	4.916	$750,110	$351,716	$220,294	$209,434	$37,856	$1,569,409	$871,437
16	2040	33,534	9.0	0.072	0.414	1.278	2.106	5.139	$784,115	$367,661	$230,280	$218,929	$39,572	$1,640,557	$875,907
17	2041	34,745	9.4	0.075	0.433	1.336	2.202	5.373	$819,749	$384,369	$240,745	$228,878	$41,370	$1,715,111	$880,492
18	2042	35,999	9.8	0.079	0.453	1.397	2.302	5.618	$857,090	$401,878	$251,712	$239,303	$43,255	$1,793,238	$885,193
19	2043	37,299	10.3	0.082	0.473	1.461	2.407	5.874	$896,222	$420,226	$263,204	$250,229	$45,230	$1,875,112	$890,008
20	2044	38,645	10.8	0.086	0.495	1.528	2.517	6.143	$937,233	$439,456	$275,248	$261,680	$47,300	$1,960,917	$894,937
21	2045	40,041	11.3	0.090	0.518	1.598	2.633	6.425	$980,215	$459,609	$287,871	$273,680	$49,469	$2,050,844	$899,979
	2046	41,486		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2047	42,984		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2048	44,535		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2049	46,143		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2050	47,809		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2051	49,535		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	Shaded cell indicates the /		157.3											Total Present Value	$17,995,407

NOTES:

1. Present Value = Future Cash Flow / (1 + Required Rate of Return)$^{\text{Number of Years You Have To Wait For The Cash Flow}}$
2. Traffic Growth Rate = $[((ADT_f / ADT_i)^{(1/(F-I))}-1] \times 100$

   where ADT_f = Average Daily Traffic for Future Year

   ADT_i = Average Daily Traffic for Initial Year

   I = Initial Year for ADT

   F = Future Year for ADT

3. Column E(Site Specific (Npredicted / expected)) is updated based on manually updating AADT within the copy of the spreadsheet and get copy the crash rate for each year here.

Note: Build Alternative: AADTs was adjusted to 4 -lane from 6-lane segment by reducing 33% (Build Option 2: 29,500 *33% = 19,700)

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst		Roadway	SR 31
Agency or Company	AECOM	Intersection	Marina Dr and SR 31
Date Performed	10/27/22	Jurisdiction	Lee County
		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)	--	19,700
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	1,900
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	2.27
Data for unsignalized intersections only:		--	
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	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	2
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]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected / Permissive
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected / Permissive
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			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	7
Number of bus stops within 300 m (1,000 ft.) of the intersection		0	0
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	0

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)
0.81	0.87	1.00	1.00	0.91	1.00	0.65

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	3.770	1.000		3.770	0.65	2.27	5.522
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	1.208	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$	0.334	1.260	0.65	2.27	1.846
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	2.406	$(5)_{TOTAL}-(5)_{FI}$	0.666	2.509	0.65	2.27	3.676

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	1.846	1.000	3.676	5.522
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.831	0.483	1.775	2.606
Head-on collision	0.049	0.090	0.030	0.110	0.201
Angle collision	0.347	0.641	0.244	0.897	1.537
Sideswipe	0.099	0.183	0.032	0.118	0.300
Other multiple-vehicle collision	0.055	0.102	0.211	0.776	0.877

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	0.235	1.000		0.235	0.65	2.27	0.344
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.060	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$	0.256	0.060	0.65	2.27	0.088
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.176	$(5)_{TOTAL}-(5)_{FI}$	0.744	0.175	0.65	2.27	0.256

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	0.088	1.000	0.256	0.344
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(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	0.066	0.870	0.223	0.289
Collision with other object	0.072	0.006	0.070	0.018	0.024
Other single-vehicle collision	0.040	0.004	0.023	0.006	0.009
Single-vehicle noncollision	0.141	0.012	0.034	0.009	0.021

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	--	--	--	--	2.27	--
Fatal and injury (FI)	--	--	--	--	2.27	--

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)
1.00	1.00	1.00	1.00

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	1.00	2.27	0.008
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	2.27	0.008

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	5.522	0.344	5.866	0.015	2.27	0.088
Fatal and injury (FI)	--	--	--	--	2.27	0.088

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)	0.831	1.775	2.606
Head-on collisions (from Worksheet 2D)	0.090	0.110	0.201
Angle collisions (from Worksheet 2D)	0.641	0.897	1.537
Sideswipe (from Worksheet 2D)	0.183	0.118	0.300
Other multiple-vehicle collision (from Worksheet 2D)	0.102	0.776	0.877
Subtotal	1.846	3.676	5.522
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)	0.066	0.223	0.289
Collision with other object (from Worksheet 2F)	0.006	0.018	0.024
Other single-vehicle collision (from Worksheet 2F)	0.004	0.006	0.009
Single-vehicle noncollision (from Worksheet 2F)	0.012	0.009	0.021
Collision with pedestrian (from Worksheet 2G or 2I)	0.008	0.000	0.008
Collision with bicycle (from Worksheet 2J)	0.088	0.000	0.088
Subtotal	0.184	0.256	0.440
Total	2.030	3.932	5.962

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	6.0
Fatal and injury (FI)	2.0
Property damage only (PDO)	3.9

Present Worth Analysis
Urban/Suburban Arterial - Signalized 4 Leg Intersection
Build

General Information				Site Information			
Analyst:		Date:	10/27/2022	Location ID:	Marina Dr and SR 31	County:	Lee County
Agency or Company:		AECOM		City:		M.P. - M.P.	

Manual Input from Analysis

Major Growth Rate =	3.6%	Current Year =	2025	roject Opening Year =	2025
Minor Growth Rate =	1.0%	Rate of Return =	4.0%	Analysis Period =	21
Current Year Major AADT =	19,700	Intersection Type =	4SG		
Current Year Minor AADT =	1,900	Intersection =	Intersection1	Analyze	
		Crash Data Used =	No		

Default Distribution for Crash Severity Level (2010-2014 Florida HSM Crash Distribution)

Fatality =	0.8%	Possible Injury =	23.4%
Incapacitating =	4.6%	Property Damage Only =	57.1%
Non-Incapacitating =	14.2%	Segment Type =	4D
			100.1%

	Year	Major AADT	Minor AADT	Annual Number of Crashes						Annual Cost						
					Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Fatality	Incap.	Non-Inc.	Possible Injury	PDO	Total Cost	Present Value
1	2025	19,700	1,900	6.0	0.048	0.274	0.847	1.395	3.404	$519,421	$243,550	$152,545	$145,025	$26,214	$1,086,754	$1,044,956
2	2026	20,409	1,919	6.2	0.050	0.285	0.881	1.451	3.541	$540,245	$253,313	$158,660	$150,839	$27,265	$1,130,321	$1,045,046
3	2027	21,144	1,938	6.4	0.052	0.297	0.916	1.509	3.683	$561,909	$263,471	$165,022	$156,888	$28,358	$1,175,649	$1,045,147
4	2028	21,905	1,958	6.7	0.054	0.309	0.953	1.570	3.831	$584,449	$274,040	$171,642	$163,181	$29,495	$1,222,807	$1,045,260
5	2029	22,694	1,977	7.0	0.056	0.321	0.991	1.633	3.984	$607,899	$285,036	$178,529	$169,728	$30,679	$1,271,871	$1,045,385
6	2030	23,511	1,997	7.3	0.058	0.334	1.031	1.698	4.144	$632,297	$296,475	$185,694	$176,540	$31,910	$1,322,917	$1,045,521
7	2031	24,357	2,017	7.5	0.060	0.347	1.072	1.766	4.311	$657,681	$308,378	$193,149	$183,628	$33,191	$1,376,027	$1,045,667
8	2032	25,234	2,037	7.9	0.063	0.361	1.115	1.837	4.484	$684,092	$320,761	$200,905	$191,002	$34,524	$1,431,284	$1,045,825
9	2033	26,142	2,057	8.2	0.065	0.376	1.160	1.911	4.664	$711,570	$333,645	$208,975	$198,674	$35,911	$1,488,775	$1,045,994
10	2034	27,083	2,078	8.5	0.068	0.391	1.206	1.988	4.851	$740,159	$347,051	$217,371	$206,656	$37,354	$1,548,591	$1,046,173
11	2035	28,058	2,099	8.8	0.071	0.407	1.255	2.068	5.046	$769,905	$360,998	$226,107	$214,961	$38,855	$1,610,827	$1,046,362
12	2036	29,069	2,120	9.2	0.074	0.423	1.305	2.151	5.249	$800,855	$375,510	$235,196	$223,602	$40,417	$1,675,580	$1,046,562
13	2037	30,115	2,141	9.6	0.076	0.440	1.358	2.238	5.460	$833,056	$390,609	$244,653	$232,593	$42,042	$1,742,953	$1,046,772
14	2038	31,199	2,162	9.9	0.080	0.458	1.412	2.328	5.680	$866,560	$406,318	$254,493	$241,948	$43,733	$1,813,052	$1,046,992
15	2039	32,322	2,184	10.3	0.083	0.476	1.469	2.421	5.908	$901,421	$422,664	$264,731	$251,681	$45,492	$1,885,989	$1,047,223
16	2040	33,486	2,206	10.8	0.086	0.495	1.528	2.519	6.146	$937,692	$439,671	$275,383	$261,808	$47,323	$1,961,877	$1,047,462
17	2041	34,691	2,228	11.2	0.090	0.515	1.590	2.620	6.393	$975,432	$457,367	$286,467	$272,345	$49,227	$2,040,838	$1,047,712
18	2042	35,940	2,250	11.6	0.093	0.536	1.654	2.725	6.651	$1,014,700	$475,779	$297,999	$283,309	$51,209	$2,122,997	$1,047,971
19	2043	37,234	2,273	12.1	0.097	0.557	1.720	2.835	6.918	$1,055,559	$494,937	$309,998	$294,717	$53,271	$2,208,482	$1,048,239
20	2044	38,575	2,295	12.6	0.101	0.580	1.790	2.949	7.197	$1,098,072	$514,871	$322,484	$306,587	$55,417	$2,297,430	$1,048,517
21	2045	39,963	2,318	13.1	0.105	0.603	1.862	3.068	7.487	$1,142,307	$535,612	$335,475	$318,937	$57,649	$2,389,981	$1,048,804
	2046	41,402	2,342		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2047	42,892	2,365		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2048	44,437	2,389		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2049	46,036	2,412		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2050	47,694	2,437		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0
	2051	49,411	2,461		0.000	0.000	0.000	0.000	0.000	$0	$0	$0	$0	$0	$0	$0

Shaded cell indicates the AADT is ou 190.9

Total Present Value $21,977,591

NOTES:

1. Present Value = Future Cash Flow / (1 + Required Rate of Return)$^{\text{Number of Years You Have To Wait For The Cash Flow}}$
2. Traffic Growth Rate = $[((ADT_f / ADT_i)^{(1/(F-I))})-1] \times 100$

   where ADT_f = Average Daily Traffic for Future Year

   ADT_i = Average Daily Traffic for Initial Year

   I = Initial Year for ADT

   F = Future Year for ADT
3. Column F(Site Specific (Npredicted / expected)) is updated based on manually updating AADT within the copy of the spreadsheet and get copy the crash rate for each year here.

Appendix C
Preliminary Synchro Analysis
SR 31 at Marina and Restaurant Entrance

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	123	0	0	28	56	77	1011	20	20	1174	38
Future Vol, veh/h	0	0	123	0	0	28	56	77	1011	20	20	1174	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	2	6	2	2	2	2	6	6	2	2	6	6
Mvmt Flow	0	0	129	0	0	29	59	81	1064	21	21	1236	40

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	-	-	618	-	-	543	902	1276	0	0	1085	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.22	-	-	7.14	5.64	5.42	-	-	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.96	-	-	3.92	2.32	3.16	-	-	3.12	-	-
Pot Cap-1 Maneuver	0	0	363	0	0	414	498	277	-	-	356	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	363	-	-	414	297	297	-	-	356	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	14.4	3.1	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	297	-	-	363	414	356	-	-
HCM Lane V/C Ratio	0.471	-	-	0.357	0.071	0.059	-	-
HCM Control Delay (s)	27.5	-	-	20.3	14.4	15.7	-	-
HCM Lane LOS	D	-	-	C	B	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	1.6	0.2	0.2	-	-

Intersection													
Int Delay, s/veh	3.8												
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBU**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations													
Traffic Vol, veh/h	0	0	197	0	0	16	103	76	1262	27	27	989	83
Future Vol, veh/h	0	0	197	0	0	16	103	76	1262	27	27	989	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	2	6	2	2	2	2	6	6	2	2	6	6
Mvmt Flow	0	0	207	0	0	17	108	80	1328	28	28	1041	87

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	-	-	521	-	-	678	760	1128	0	0	1356	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.22	-	-	7.14	5.64	5.42	-	-	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.96	-	-	3.92	2.32	3.16	-	-	3.12	-	-
Pot Cap-1 Maneuver	0	0	420	0	0	338	597	328	-	-	262	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	420	-	-	338	322	322	-	-	262	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.6	16.2	3.8	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	322	-	-	420	338	262	-	-
HCM Lane V/C Ratio	0.585	-	-	0.494	0.05	0.108	-	-
HCM Control Delay (s)	30.9	-	-	21.6	16.2	20.4	-	-
HCM Lane LOS	D	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	3.5	-	-	2.7	0.2	0.4	-	-

Intersection	
Int Delay, s/veh	12.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	161	0	0	34	70	93	2298	25	25	2720	45
Future Vol, veh/h	0	0	161	0	0	34	70	93	2298	25	25	2720	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	2	5	2	2	2	2	5	5	2	2	5	5
Mvmt Flow	0	0	169	0	0	36	74	98	2419	26	26	2863	47

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	-	-	1432	-	-	1223	2090	2910	0	0	2445	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.2	-	-	7.14	5.64	5.4	-	-	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.95	-	-	3.92	2.32	3.15	-	-	3.12	-	-
Pot Cap-1 Maneuver	0	0	~ 103	0	0	147	107	~ 40	-	-	74	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	~ 103	-	-	147	~ -5	~ -5	-	-	74	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 401.9	37.2		0.7
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	+	-	-	103	147	74	-	-
HCM Lane V/C Ratio	-	-	-	1.645	0.243	0.356	-	-
HCM Control Delay (s)	-	-	-	$ 401.9	37.2	78.4	-	-
HCM Lane LOS	-	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	-	-	-	13.1	0.9	1.4	-	-

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

Intersection													
Int Delay, s/veh	14.6												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	232	0	0	16	122	89	2778	32	32	2183	98
Future Vol, veh/h	0	0	232	0	0	16	122	89	2778	32	32	2183	98
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	2	5	2	2	2	2	5	5	2	2	5	5
Mvmt Flow	0	0	244	0	0	17	128	94	2924	34	34	2298	103

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	-	-	1149	-	-	1479	1677	2401	0	0	2958	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.2	-	-	7.14	5.64	5.4	-	-	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.95	-	-	3.92	2.32	3.15	-	-	3.12	-	-
Pot Cap-1 Maneuver	0	0	~ 161	0	0	98	183	~ 75	-	-	40	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	~ 161	-	-	98	~ -4	~ -4	-	-	40	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 313.3	49.2		3.4
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	+	-	-	161	98	40	-	-
HCM Lane V/C Ratio	-	-	-	1.517	0.172	0.842	-	-
HCM Control Delay (s)	-	-	-	$ 313.3	49.2	247.5	-	-
HCM Lane LOS	-	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	-	-	-	16.1	0.6	3.2	-	-

Notes

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

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	44	0	59	20	0	28	56	77	967	20	20	1174	38
Future Vol, veh/h	44	0	59	20	0	28	56	77	967	20	20	1174	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	2	6	2	2	2	2	6	6	2	2	6	6
Mvmt Flow	46	0	62	21	0	29	59	81	1018	21	21	1236	40

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	1965	2597	618	1845	2627	520	902	1276	0	0	1039	0	0
Stage 1	1278	1278	-	1309	1309	-	-	-	-	-	-	-	-
Stage 2	687	1319	-	536	1318	-	-	-	-	-	-	-	-
Critical Hdwy	6.52	6.54	7.22	6.44	6.54	7.14	5.64	5.42	-	-	5.34	-	-
Critical Hdwy Stg 1	7.42	5.54	-	7.34	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.82	5.54	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.86	4.02	3.96	3.82	4.02	3.92	2.32	3.16	-	-	3.12	-	-
Pot Cap-1 Maneuver	64	25	363	79	23	429	498	277	-	-	375	-	-
Stage 1	123	235	-	121	227	-	-	-	-	-	-	-	-
Stage 2	359	225	-	453	225	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	~ 38	13	363	42	12	429	323	323	-	-	375	-	-
Mov Cap-2 Maneuver	~ 38	13	-	42	12	-	-	-	-	-	-	-	-
Stage 1	70	222	-	68	128	-	-	-	-	-	-	-	-
Stage 2	189	127	-	354	212	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	173	88.9	2.9	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	323	-	-	38	363	89	375	-	-
HCM Lane V/C Ratio	0.433	-	-	1.219	0.171	0.568	0.056	-	-
HCM Control Delay (s)	24.4	-	-	$ 382.2	17	88.9	15.2	-	-
HCM Lane LOS	C	-	-	F	C	F	C	-	-
HCM 95th %tile Q(veh)	2.1	-	-	4.7	0.6	2.6	0.2	-	-

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

Intersection	
Int Delay, s/veh	23

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	58	0	112	27	0	16	103	76	1204	27	27	989	83
Future Vol, veh/h	58	0	112	27	0	16	103	76	1204	27	27	989	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	2	6	2	2	2	2	6	6	2	2	6	6
Mvmt Flow	61	0	118	28	0	17	108	80	1267	28	28	1041	87

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	1980	2768	521	2129	2841	648	760	1128	0	0	1295	0	0
Stage 1	1097	1097	-	1657	1657	-	-	-	-	-	-	-	-
Stage 2	883	1671	-	472	1184	-	-	-	-	-	-	-	-
Critical Hdwy	6.52	6.54	7.22	6.44	6.54	7.14	5.64	5.42	-	-	5.34	-	-
Critical Hdwy Stg 1	7.42	5.54	-	7.34	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.82	5.54	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.86	4.02	3.96	3.82	4.02	3.92	2.32	3.16	-	-	3.12	-	-
Pot Cap-1 Maneuver	62	19	420	53	17	354	597	328	-	-	281	-	-
Stage 1	165	287	-	68	154	-	-	-	-	-	-	-	-
Stage 2	271	151	-	495	261	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	~ 34	9	420	~ 22	8	354	383	383	-	-	281	-	-
Mov Cap-2 Maneuver	~ 34	9	-	~ 22	8	-	-	-	-	-	-	-	-
Stage 1	84	258	-	35	79	-	-	-	-	-	-	-	-
Stage 2	132	77	-	321	235	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	227	$ 448.1	2.9	0.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	383	-	-	34	420	34	281	-	-
HCM Lane V/C Ratio	0.492	-	-	1.796	0.281	1.331	0.101	-	-
HCM Control Delay (s)	23.1	-	-	$ 632.8	16.9	$ 448.1	19.2	-	-
HCM Lane LOS	C	-	-	F	C	F	C	-	-
HCM 95th %tile Q(veh)	2.6	-	-	6.8	1.1	4.9	0.3	-	-

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

Intersection	
Int Delay, s/veh	73.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	54	0	82	25	0	34	70	93	2244	25	25	2720	45
Future Vol, veh/h	54	0	82	25	0	34	70	93	2244	25	25	2720	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	2	5	2	2	2	2	5	5	2	2	5	5
Mvmt Flow	57	0	86	26	0	36	74	98	2362	26	26	2863	47

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	4204	5647	1432	3916	5681	1194	2090	2910	0	0	2388	0	0
Stage 1	2915	2915	-	2719	2719	-	-	-	-	-	-	-	-
Stage 2	1289	2732	-	1197	2962	-	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.54	7.2	6.44	6.54	7.14	5.64	5.4	-	-	5.34	-	-
Critical Hdwy Stg 1	7.4	5.54	-	7.34	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.8	5.54	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.85	4.02	3.95	3.82	4.02	3.92	2.32	3.15	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 2	0	103	~ 4	0	154	107	~ 40	-	-	79	-	-
Stage 1	~ 8	34	-	~ 11	44	-	-	-	-	-	-	-	-
Stage 2	151	43	-	177	32	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	0	103	-	0	154	~ 30	~ 30	-	-	79	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-	-
Stage 1	~ 8	23	-	~ 11	0	-	-	-	-	-	-	-	-
Stage 2	-	0	-	~ 19	21	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			162.4	0.6
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 30	-	-	-	103	-	79	-	-
HCM Lane V/C Ratio	5.719	-	-	-	0.838	-	0.333	-	-
HCM Control Delay (s)	$ 2423.3	-	-	-	124	-	71.8	-	-
HCM Lane LOS	F	-	-	-	F	-	F	-	-
HCM 95th %tile Q(veh)	20.8	-	-	-	4.7	-	1.3	-	-

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

Intersection	
Int Delay, s/veh	79.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	68	0	132	32	0	16	122	89	2710	32	32	2183	98
Future Vol, veh/h	68	0	132	32	0	16	122	89	2710	32	32	2183	98
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	-	400	-	-	150	-	220
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	2	5	2	2	2	2	5	5	2	2	5	5
Mvmt Flow	72	0	139	34	0	17	128	94	2853	34	34	2298	103

Major/Minor	Minor2			Minor1			Major1				Major2		
Conflicting Flow All	3951	5697	1149	4301	5783	1444	1677	2401	0	0	2887	0	0
Stage 1	2366	2366	-	3314	3314	-	-	-	-	-	-	-	-
Stage 2	1585	3331	-	987	2469	-	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.54	7.2	6.44	6.54	7.14	5.64	5.4	-	-	5.34	-	-
Critical Hdwy Stg 1	7.4	5.54	-	7.34	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.8	5.54	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.85	4.02	3.95	3.82	4.02	3.92	2.32	3.15	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 3	0	161	~ 2	0	104	183	~ 75	-	-	43	-	-
Stage 1	~ 20	67	-	~ 4	21	-	-	-	-	-	-	-	-
Stage 2	97	20	-	240	59	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	0	161	-	0	104	~ 43	~ 43	-	-	43	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-	-
Stage 1	~ 20	14	-	~ 4	0	-	-	-	-	-	-	-	-
Stage 2	-	0	-	~ 7	12	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			146.5	3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 43	-	-	-	161	-	43	-	-
HCM Lane V/C Ratio	5.165	-	-	-	0.863	-	0.783	-	-
HCM Control Delay (s)	$ 2049.9	-	-	-	94.7	-	218.5	-	-
HCM Lane LOS	F	-	-	-	F	-	F	-	-
HCM 95th %tile Q(veh)	25.6	-	-	-	6	-	3	-	-

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

Appendix D
Warrants Analysis
SR 31 at Marina and Restaurant Entrance

24 Hour Existing Counts (2019) - Marina and Restaurant Ent.								
Time	EB	WB	NB	SB	Major St. Approaches	Highest Minor St. Approach	Total Volume	Rank by Minor Approach
12:00 AM	4	0	25	40	66	4	69	18
1:00 AM	0	0	19	27	46	0	46	24
2:00 AM	1	0	12	29	41	1	41	22
3:00 AM	1	0	24	38	61	1	62	21
4:00 AM	2	0	37	55	93	2	94	20
5:00 AM	1	0	141	118	259	1	260	22
6:00 AM	3	0	343	376	719	3	722	19
7:00 AM	5	0	456	444	900	5	904	17
8:00 AM	7	0	376	502	878	7	885	16
9:00 AM	13	0	386	376	762	13	775	15
10:00 AM	14	0	372	364	735	14	749	14
11:00 AM	27	0	406	373	779	27	806	12
12:00 PM	63	0	427	433	860	63	924	7
1:00 PM	83	0	454	457	912	83	994	5
2:00 PM	82	0	451	459	910	82	992	6
3:00 PM	99	0	509	541	1,050	99	1,149	1
4:00 PM	58	0	533	528	1,061	58	1,119	9
5:00 PM	60	0	579	577	1,156	60	1,217	8
6:00 PM	85	0	441	440	881	85	966	2
7:00 PM	84	0	316	320	636	84	720	4
8:00 PM	84	0	229	266	496	84	580	3
9:00 PM	54	0	162	197	360	54	414	10
10:00 PM	34	0	96	129	225	34	259	11
11:00 PM	17	0	47	65	112	17	129	13

Marina/Restaurant/Babcock Ranch Road at SR 31 Signal Warrant Volumes (Year 2025)								
Time	**EB**	**WB**	**NB**	**SB**	**Major St. Approaches**	**Highest Minor St. Approach**	**Total Volume**	**Rank by Minor Approach**
12:00 AM	1	2	55	75	131	2	133	22
1:00 AM	1	1	41	51	92	1	93	24
2:00 AM	1	1	26	54	80	1	82	23
3:00 AM	2	1	51	71	122	2	125	21
4:00 AM	3	3	81	103	184	3	190	20
5:00 AM	1	9	306	221	527	9	537	19
6:00 AM	6	10	745	702	1,447	10	1,463	18
7:00 AM	8	18	990	829	1,818	18	1,844	15
8:00 AM	9	16	817	937	1,754	16	1,779	17
9:00 AM	19	12	838	703	1,541	19	1,572	14
10:00 AM	21	14	806	680	1,486	21	1,522	13
11:00 AM	31	16	880	698	1,578	31	1,625	12
12:00 PM	49	27	926	810	1,736	49	1,812	10
1:00 PM	64	38	985	871	1,856	64	1,957	7
2:00 PM	63	37	978	874	1,852	63	1,952	8
3:00 PM	80	43	1,104	1,030	2,134	80	2,257	4
4:00 PM	103	48	1,120	1,232	2,352	103	2,503	2
5:00 PM	170	43	1,410	1,099	2,509	170	2,722	1
6:00 PM	81	27	956	823	1,779	81	1,887	3
7:00 PM	80	22	686	598	1,285	80	1,387	5
8:00 PM	75	17	498	498	996	75	1,088	6
9:00 PM	55	12	352	369	721	55	788	9
10:00 PM	35	8	209	240	450	35	492	11
11:00 PM	17	4	101	122	223	17	244	16

Marina/Restaurant/Babcock Ranch Road at SR 31 Signal Warrant Volumes (Year 2035)								
Time	**EB**	**WB**	**NB**	**SB**	**Major St. Approaches**	**Highest Minor St. Approach**	**Total Volume**	**Rank by Minor Approach**
12:00 AM	1	1	97	137	234	1	236	23
1:00 AM	1	1	71	93	164	1	166	24
2:00 AM	1	1	46	98	144	1	145	22
3:00 AM	2	1	89	129	218	2	222	21
4:00 AM	3	3	142	188	330	3	336	20
5:00 AM	1	7	536	402	937	7	946	19
6:00 AM	6	8	1,303	1,279	2,582	8	2,596	18
7:00 AM	10	16	1,731	1,509	3,240	16	3,265	16
8:00 AM	10	14	1,429	1,707	3,135	14	3,159	17
9:00 AM	22	13	1,465	1,280	2,745	22	2,781	14
10:00 AM	24	15	1,410	1,238	2,648	24	2,688	13
11:00 AM	35	17	1,540	1,270	2,810	35	2,863	12
12:00 PM	53	26	1,620	1,475	3,095	53	3,174	10
1:00 PM	69	40	1,724	1,585	3,309	69	3,418	7
2:00 PM	68	39	1,711	1,592	3,303	68	3,410	8
3:00 PM	87	46	1,932	1,874	3,806	87	3,938	4
4:00 PM	112	51	1,621	1,787	3,408	112	3,571	2
5:00 PM	184	45	2,041	1,594	3,635	184	3,865	1
6:00 PM	88	28	1,673	1,497	3,170	88	3,287	3
7:00 PM	87	23	1,201	1,089	2,290	87	2,400	5
8:00 PM	81	18	871	906	1,777	81	1,877	6
9:00 PM	60	13	616	671	1,287	60	1,360	9
10:00 PM	38	8	366	438	804	38	850	11
11:00 PM	19	4	177	222	399	19	422	15

Marina/Restaurant/Babcock Ranch Road at SR 31 Signal Warrant Volumes (Year 2045)								
Time	EB	WB	NB	SB	Major St. Approaches	Highest Minor St. Approach	Total Volume	Rank by Minor Approach
12:00 AM	2	2	106	160	266	2	270	21
1:00 AM	1	2	78	108	186	2	189	23
2:00 AM	1	1	50	114	164	1	166	24
3:00 AM	1	2	98	150	248	2	252	22
4:00 AM	2	3	156	219	375	3	380	20
5:00 AM	1	4	588	468	1,055	4	1,061	19
6:00 AM	4	6	1,429	1,489	2,918	6	2,928	18
7:00 AM	6	12	1,899	1,757	3,656	12	3,674	16
8:00 AM	8	11	1,567	1,987	3,554	11	3,574	17
9:00 AM	15	17	1,607	1,491	3,098	17	3,131	14
10:00 AM	17	16	1,547	1,441	2,989	17	3,022	15
11:00 AM	32	28	1,689	1,479	3,169	32	3,228	12
12:00 PM	76	31	1,777	1,717	3,494	76	3,601	8
1:00 PM	99	41	1,891	1,812	3,703	99	3,844	5
2:00 PM	87	43	1,877	1,820	3,697	87	3,828	6
3:00 PM	108	48	2,119	2,143	4,262	108	4,418	3
4:00 PM	136	59	2,432	2,790	5,222	136	5,417	2
5:00 PM	200	48	2,953	2,313	5,266	200	5,514	1
6:00 PM	102	32	1,835	1,744	3,579	102	3,713	4
7:00 PM	80	23	1,317	1,268	2,586	80	2,689	7
8:00 PM	66	18	956	1,055	2,011	66	2,095	9
9:00 PM	65	13	676	782	1,457	65	1,536	10
10:00 PM	41	8	402	510	911	41	961	11
11:00 PM	21	4	194	259	453	21	477	13

SIGNAL WARRANT ANALYSIS

Introduction

- The Signal Warrant Analysis Spreadsheets are a tool for assisting traffic engineers when evaluating the need for a traffic signal installation
- The filled spreadsheets can be used as part of the supporting documents for the signal warrant evaluation

Note: This templates are a useful resource, but it remains necessary to apply engineering judgment and to consider specific environmental, traffic, geometric, and operational conditions

Instructions

Fill in "Orange" areas only	
Automated cells based on in Input Data in "orange" cells	
General Information	Fill in below the general information including: District, County (drop-down menu) City, Engineer, Date Major and Minor Street with corresponding number of lanes and speed limits
Enter Eight Hour Volumes	Any 8 hours of an average day. Major-street and minor-street volumes shall be for the same 8 hours; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B for 80% columns only. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.
Enter Four Hour Volumes	Any 4 hours of an average day. Vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only, not required to be on the same approach during each of the 4 hours)
Enter Pedestrian Volumes (4-hr)	Pedestrians per hour crossing the major street (total of all crossings)
Enter Peak Hour Volumes	Vehicular: Any four consecutive 15-minute periods of an average day Pedestrian: Any four consecutive 15-minute periods of an average day representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings)

Input Data

City:					
County:	12 – Lee	Engineer:	AECOM		
District:	One	Date:	March 8th, 2023		
Major Street:	SR 31	# Lanes:	6	Major Approach Speed:	45
Minor Street:	arina/Restaurant Entran	# Lanes:	2	Minor Approach Speed:	30

Eight Hour Volumes (Condition A)

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	2509	170
4:00 PM	2352	103
6:00 PM	1779	81
3:00 PM	2134	80
7:00 PM	1285	80
8:00 PM	996	75
1:00 PM	1856	64
2:00 PM	1852	63

Eight Hour Volumes (Condition B)

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	2509	170
4:00 PM	2352	103
6:00 PM	1779	81
3:00 PM	2134	80
7:00 PM	1285	80
8:00 PM	996	75
1:00 PM	1856	64
2:00 PM	1852	63

Highest Four Hour Vehicular Volumes

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	2509	170
4:00 PM	2352	103
6:00 PM	1779	81
3:00 PM	2134	80

Highest Four Hour Pedestrian Volumes

Hours	Major Street (total of both approaches)	Pedestrian Crossings on Major Street

Vehicular Peak Hour Volumes

Peak Hour	Major Street (total of both approaches)	Minor Street (one direction only)	Total Entering Volume
5:00 PM	2509	170	2722

Pedestrian Peak Hour Volumes

Peak Hour	Major Street (total of both approaches)	Pedestrian Crossing Volumes on Major Street

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	**AECOM**
County:	**12 – Lee**	Date:	**March 8th, 2023**
District:	**One**		

Major Street:	**SR 31**	Lanes:	**6**	Major Approach Speed:	**45**
Minor Street:	**Marina/Restaurant Entrance**	Lanes:	**2**	Minor Approach Speed:	**30**

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied for eight hours. ☑ Yes ☐ No

Warrant 1 is also satisfied if both Condition A and Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems). ☐ Yes ☐ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	5:00 PM	**4:00 PM**	**6:00 PM**	**3:00 PM**	**7:00 PM**	**8:00 PM**	**1:00 PM**	**2:00 PM**
Major	2,509	2,352	1,779	2,134	1,285	996	1,856	1,852
Minor	170	103	81	80	80	75	64	63

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☑ Yes	☐ No
70% Satisfied:	☑ Yes	☐ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	5:00 PM	4:00 PM	6:00 PM	3:00 PM	7:00 PM	8:00 PM	1:00 PM	2:00 PM
Major	2,509	2,352	1,779	2,134	1,285	996	1,856	1,852
Minor	170	103	81	80	80	75	64	63

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	AECOM
County:	12 – Lee	Date:	March 8th, 2023
District:	One		

Major Street:	SR 31	Lanes:	6	Major Approach Speed:	45
Minor Street:	Marina/Restaurant Entrance	Lanes:	2	Minor Approach Speed:	30

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ Yes ☐ No

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

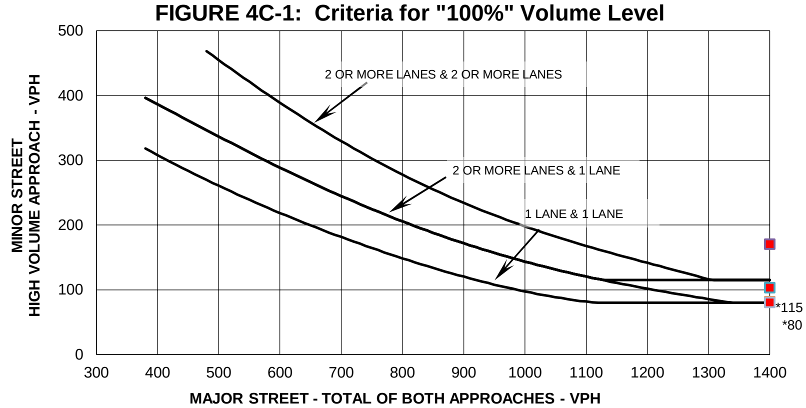
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	2509	170
4:00 PM	2352	103
6:00 PM	1779	81
3:00 PM	2134	80

FIGURE 4C-1: Criteria for "100%" Volume Level



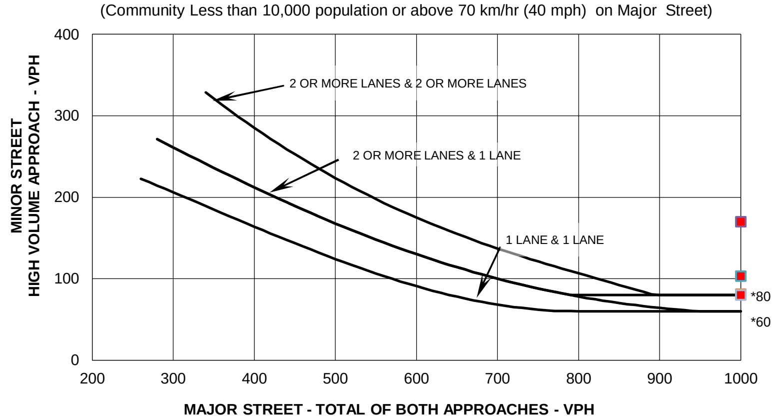
** Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	2509	170
4:00 PM	2352	103
6:00 PM	1779	81
3:00 PM	2134	80

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

SIGNAL WARRANT ANALYSIS

Introduction

- The Signal Warrant Analysis Spreadsheets are a tool for assisting traffic engineers when evaluating the need for a traffic signal installation
- The filled spreadsheets can be used as part of the supporting documents for the signal warrant evaluation

Note: This templates are a useful resource, but it remains necessary to apply engineering judgment and to consider specific environmental, traffic, geometric, and operational conditions

Instructions

Fill in "Orange" areas only	
Automated cells based on in Input Data in "orange" cells	
General Information	Fill in below the general information including: District, County (drop-down menu) City, Engineer, Date Major and Minor Street with corresponding number of lanes and speed limits
Enter Eight Hour Volumes	Any 8 hours of an average day. Major-street and minor-street volumes shall be for the same 8 hours; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B for 80% columns only. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.
Enter Four Hour Volumes	Any 4 hours of an average day. Vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only, not required to be on the same approach during each of the 4 hours)
Enter Pedestrian Volumes (4-hr)	Pedestrians per hour crossing the major street (total of all crossings)
Enter Peak Hour Volumes	Vehicular: Any four consecutive 15-minute periods of an average day Pedestrian: Any four consecutive 15-minute periods of an average day representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings)

Input Data

City:					
County:	**12 – Lee**	Engineer:	**AECOM**		
District:	**One**	Date:	**March 8th, 2023**		
Major Street:	**SR 31**	# Lanes:	**6**	Major Approach Speed:	**45**
Minor Street:	**arina/Restaurant Entran**	# Lanes:	**2**	Minor Approach Speed:	**30**

Eight Hour Volumes (Condition A)

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	3635	184
4:00 PM	3408	112
6:00 PM	3170	88
3:00 PM	3806	87
7:00 PM	2290	87
8:00 PM	1777	81
7:00 PM	3309	69
2:00 PM	3303	68

Eight Hour Volumes (Condition B)

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	3635	184
4:00 PM	3408	112
6:00 PM	3170	88
3:00 PM	3806	87
7:00 PM	2290	87
8:00 PM	1777	81
7:00 PM	3309	69
2:00 PM	3303	68

Highest Four Hour Vehicular Volumes

Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	3635	184
4:00 PM	3408	112
6:00 PM	3170	88
3:00 PM	3806	87

Highest Four Hour Pedestrian Volumes

Hours	Major Street (total of both approaches)	Pedestrian Crossings on Major Street

Vehicular Peak Hour Volumes

Peak Hour	Major Street (total of both approaches)	Minor Street (one direction only)	Total Entering Volume
5:00 PM	3635	184	3865

Pedestrian Peak Hour Volumes

Peak Hour	Major Street (total of both approaches)	Pedestrian Crossing Volumes on Major Street

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	**AECOM**
County:	**12 – Lee**	Date:	**March 8th, 2023**
District:	**One**		

Major Street:	**SR 31**	Lanes:	**6**	Major Approach Speed:	**45**
Minor Street:	**Marina/Restaurant Entrance**	Lanes:	**2**	Minor Approach Speed:	**30**

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied for eight hours. ☑ Yes ☐ No

Warrant 1 is also satisfied if both Condition A and Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems). ☐ Yes ☐ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	5:00 PM	**4:00 PM**	**6:00 PM**	**3:00 PM**	**7:00 PM**	**8:00 PM**	**7:00 PM**	**2:00 PM**
Major	3,635	3,408	3,170	3,806	2,290	1,777	3,309	3,303
Minor	184	112	88	87	87	81	69	68

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

	Yes	No
Applicable:	☑	☐
100% Satisfied:	☐	☑
80% Satisfied:	☑	☐
70% Satisfied:	☑	☐

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	5:00 PM	4:00 PM	6:00 PM	3:00 PM	7:00 PM	8:00 PM	7:00 PM	2:00 PM
Major	3,635	3,408	3,170	3,806	2,290	1,777	3,309	3,303
Minor	184	112	88	87	87	81	69	68

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	AECOM
County:	12 – Lee	Date:	March 8th, 2023
District:	One		

Major Street:	SR 31	Lanes:	6	Major Approach Speed:	45
Minor Street:	Marina/Restaurant Entrance	Lanes:	2	Minor Approach Speed:	30

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Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ Yes ☐ No

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

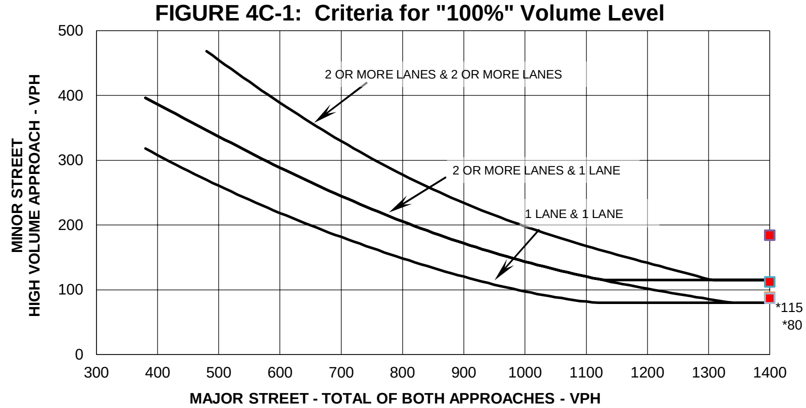
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	3635	184
4:00 PM	3408	112
6:00 PM	3170	88
3:00 PM	3806	87

FIGURE 4C-1: Criteria for "100%" Volume Level



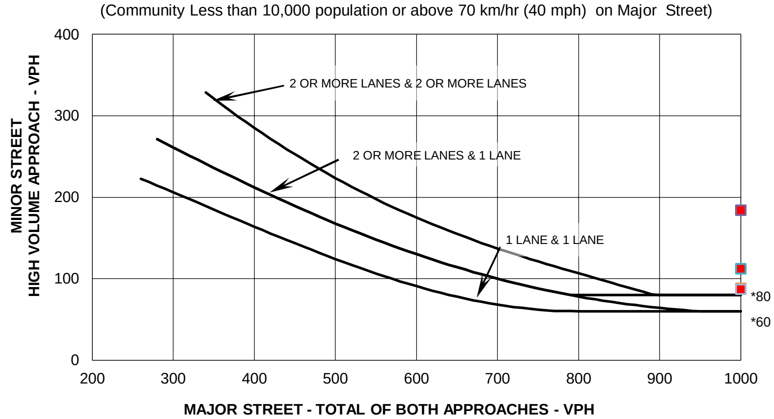
** Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	3635	184
4:00 PM	3408	112
6:00 PM	3170	88
3:00 PM	3806	87

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

SIGNAL WARRANT ANALYSIS

Introduction

- The Signal Warrant Analysis Spreadsheets are a tool for assisting traffic engineers when evaluating the need for a traffic signal installation
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Instructions

Fill in "Orange" areas only	
Automated cells based on in Input Data in "orange" cells	
General Information	Fill in below the general information including: District, County (drop-down menu) City, Engineer, Date Major and Minor Street with corresponding number of lanes and speed limits
Enter Eight Hour Volumes	Any 8 hours of an average day. Major-street and minor-street volumes shall be for the same 8 hours; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B for 80% columns only. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.
Enter Four Hour Volumes	Any 4 hours of an average day. Vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only, not required to be on the same approach during each of the 4 hours)
Enter Pedestrian Volumes (4-hr)	Pedestrians per hour crossing the major street (total of all crossings)
Enter Peak Hour Volumes	Vehicular: Any four consecutive 15-minute periods of an average day Pedestrian: Any four consecutive 15-minute periods of an average day representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings)

Input Data

City:
County: **12 – Lee**
District: **One**

Engineer: **AECOM**
Date: **March 8th, 2023**

Major Street: **SR 31** | # Lanes: **6** | Major Approach Speed: **45**
Minor Street: **arina/Restaurant Entran** | # Lanes: **2** | Minor Approach Speed: **30**

Eight Hour Volumes (Condition A)		
Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	5266	200
4:00 PM	5222	136
3:00 PM	4262	108
6:00 PM	3579	102
1:00 PM	3703	99
2:00 PM	3697	87
7:00 PM	2586	80
12:00 PM	3494	76

Eight Hour Volumes (Condition B)		
Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	5266	200
4:00 PM	5222	136
3:00 PM	4262	108
6:00 PM	3579	102
1:00 PM	3703	99
2:00 PM	3697	87
7:00 PM	2586	80
12:00 PM	3494	76

Highest Four Hour Vehicular Volumes		
Hours	Major Street (total of both approaches)	Minor Street (one direction only)
5:00 PM	5266	200
4:00 PM	5222	136
3:00 PM	4262	108
6:00 PM	3579	102

Highest Four Hour Pedestrian Volumes		
Hours	Major Street (total of both approaches)	Pedestrian Crossings on Major Street

Vehicular Peak Hour Volumes			
Peak Hour	Major Street (total of both approaches)	Minor Street (one direction only)	Total Entering Volume
5:00 PM	5266	200	5514

Pedestrian Peak Hour Volumes		
Peak Hour	Major Street (total of both approaches)	Pedestrian Crossing Volumes on Major Street

Form 750-020-01
TRAFFIC ENGINEERING
10/15

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	**AECOM**
County:	**12 – Lee**	Date:	**March 8th, 2023**
District:	**One**		

Major Street:	**SR 31**	Lanes:	**6**	Major Approach Speed:	**45**
Minor Street:	**Marina/Restaurant Entrance**	Lanes:	**2**	Minor Approach Speed:	**30**

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied for eight hours. ☑ Yes ☐ No

Warrant 1 is also satisfied if both Condition A and Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems). ☐ Yes ☐ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	5:00 PM	4:00 PM	3:00 PM	6:00 PM	1:00 PM	2:00 PM	7:00 PM	12:00 PM
Major	5,266	5,222	4,262	3,579	3,703	3,697	2,586	3,494
Minor	200	136	108	102	99	87	80	76

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☑ Yes	☐ No
80% Satisfied:	☑ Yes	☐ No
70% Satisfied:	☑ Yes	☐ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours

Street	5:00 PM	4:00 PM	3:00 PM	6:00 PM	1:00 PM	2:00 PM	7:00 PM	12:00 PM
Major	5,266	5,222	4,262	3,579	3,703	3,697	2,586	3,494
Minor	200	136	108	102	99	87	80	76

Existing Volumes

Form 750-020-01
TRAFFIC ENGINEERING
10/15

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

City:		Engineer:	AECOM
County:	12 – Lee	Date:	March 8th, 2023
District:	One		

Major Street:	SR 31	Lanes:	6	Major Approach Speed:	45
Minor Street:	Marina/Restaurant Entrance	Lanes:	2	Minor Approach Speed:	30

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ Yes ☐ No

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

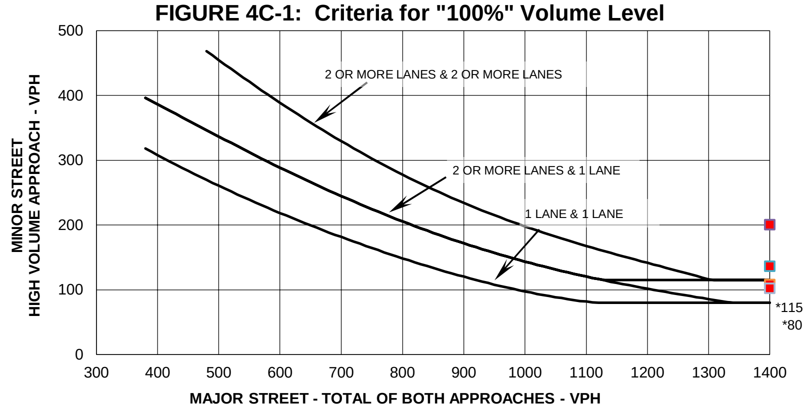
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	5266	200
4:00 PM	5222	136
3:00 PM	4262	108
6:00 PM	3579	102

FIGURE 4C-1: Criteria for "100%" Volume Level



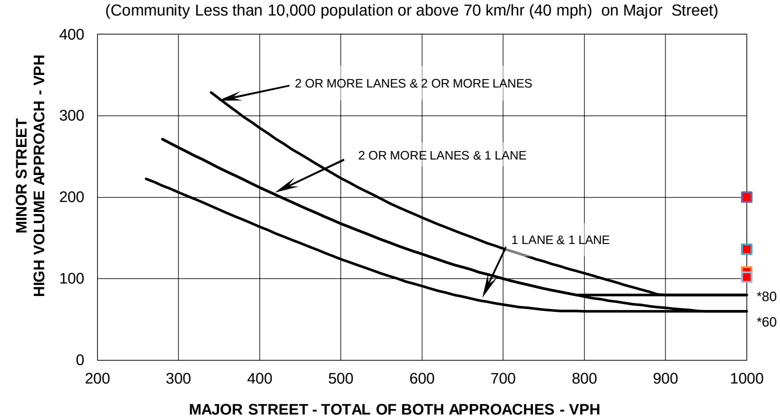
** Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
5:00 PM	5266	200
4:00 PM	5222	136
3:00 PM	4262	108
6:00 PM	3579	102

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



** Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

Appendix E
Design Year (2045) – Build Synchro Outputs

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	52	0	0	33	24	1019	6	20	32	1214	41
Future Vol, veh/h	0	0	52	0	0	33	24	1019	6	20	32	1214	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	150	-	150	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	6	2	2	2	6	2
Mvmt Flow	0	0	55	0	0	35	25	1073	6	21	34	1278	43

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	-	-	639	-	-	537	1321	0	0	783	1079	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	-	-	7.14	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	-	-	3.92	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	359	0	0	418	273	-	-	579	358	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	-	-	359	-	-	418	273	-	-	410	410	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	14.4	0.4	0.6
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	273	-	-	359	418	410	-	-
HCM Lane V/C Ratio	0.093	-	-	0.152	0.083	0.134	-	-
HCM Control Delay (s)	19.5	-	-	16.8	14.4	15.1	-	-
HCM Lane LOS	C	-	-	C	B	C	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	0.3	0.5	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	0	66	0	1056	0	56	0	1244	0
Future Vol, veh/h	0	0	0	0	0	0	66	0	1056	0	56	0	1244	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	6	2	2	2	6	2
Mvmt Flow	0	0	0	0	0	0	69	0	1112	0	59	0	1309	0

Major/Minor	Minor1			Major1				Major2			
Conflicting Flow All	-	-	556	956	1309	0	0	811	1112	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	406	465	277	-	-	559	345	-	0
Stage 1	0	0	-	-	-	-	-	-	-	-	0
Stage 2	0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %						-	-			-	
Mov Cap-1 Maneuver	-	0	406	465	465	-	-	559	559	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0.8	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	465	-	-	-	559	-
HCM Lane V/C Ratio	0.149	-	-	-	0.105	-
HCM Control Delay (s)	14.1	-	-	0	12.2	-
HCM Lane LOS	B	-	-	A	B	-
HCM 95th %tile Q(veh)	0.5	-	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	44	0	59	20	0	28	56	77	967	20	20	1174
Future Volume (veh/h)	44	0	59	20	0	28	56	77	967	20	20	1174
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1811	1870	1811	1870	1870	1870		1811	1811	1870	1870	1811
Adj Flow Rate, veh/h	46	0	62	21	0	29		81	1018	21	21	1236
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
Percent Heavy Veh, %	6	2	6	2	2	2		6	6	2	2	6
Cap, veh/h	242	0	119	118	12	61		106	2982	61	44	2773
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08		0.06	0.60	0.60	0.02	0.56
Sat Flow, veh/h	1580	0	1535	423	150	790		1725	4986	103	1781	4944
Grp Volume(v), veh/h	46	0	62	50	0	0		81	673	366	21	1236
Grp Sat Flow(s),veh/h/ln	1580	0	1535	1363	0	0		1725	1648	1793	1781	1648
Q Serve(g_s), s	0.0	0.0	2.3	0.8	0.0	0.0		2.8	6.2	6.2	0.7	8.8
Cycle Q Clear(g_c), s	1.5	0.0	2.3	2.3	0.0	0.0		2.8	6.2	6.2	0.7	8.8
Prop In Lane	1.00		1.00	0.42		0.58		1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	242	0	119	191	0	0		106	1971	1072	44	2773
V/C Ratio(X)	0.19	0.00	0.52	0.26	0.00	0.00		0.76	0.34	0.34	0.48	0.45
Avail Cap(c_a), veh/h	550	0	460	518	0	0		172	1971	1072	148	2773
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	26.6	26.5	0.0	0.0		27.7	6.1	6.1	28.9	7.7
Incr Delay (d2), s/veh	0.4	0.0	3.5	0.7	0.0	0.0		10.6	0.5	0.9	7.9	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
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.7	0.0	0.0		1.4	1.6	1.8	0.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	0.0	30.1	27.3	0.0	0.0		38.3	6.6	7.0	36.8	8.2
LnGrp LOS	C	A	C	C	A	A		D	A	A	D	A
Approach Vol, veh/h		108			50				1120			1297
Approach Delay, s/veh		28.6			27.3				9.0			8.6
Approach LOS		C			C				A			A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	41.9		10.6	9.7	39.7		10.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	19.0		18.0	6.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	2.7	8.2		4.3	4.8	10.8		4.3				
Green Ext Time (p_c), s	0.0	4.7		0.3	0.0	4.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			10.0									
HCM 6th LOS			A									
Notes												

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	38
Future Volume (veh/h)	38
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1811
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.95
Percent Heavy Veh, %	6
Cap, veh/h	861
Arrive On Green	0.56
Sat Flow, veh/h	1535
Grp Volume(v), veh/h	40
Grp Sat Flow(s),veh/h/ln	1535
Q Serve(g_s), s	0.7
Cycle Q Clear(g_c), s	0.7
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	861
V/C Ratio(X)	0.05
Avail Cap(c_a), veh/h	861
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	5.9
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.2
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	6.0
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	251	0	0	148	72	1280	12	53	72	991	113
Future Vol, veh/h	0	0	251	0	0	148	72	1280	12	53	72	991	113
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	150	-	150	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	264	0	0	156	76	1347	13	56	76	1043	119

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	-	-	522	-	-	674	1162	0	0	984	1360	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	-	-	7.14	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	-	-	3.92	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	428	0	0	341	327	-	-	448	261	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	-	-	428	-	-	341	327	-	-	258	258	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.1	24.1	1	3.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	327	-	-	428	341	258	-	-
HCM Lane V/C Ratio	0.232	-	-	0.617	0.457	0.51	-	-
HCM Control Delay (s)	19.3	-	-	26.1	24.1	32.6	-	-
HCM Lane LOS	C	-	-	D	C	D	-	-
HCM 95th %tile Q(veh)	0.9	-	-	4	2.3	2.7	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	54	127	0	1293	27	76	27	1118	0
Future Vol, veh/h	0	0	0	0	0	54	127	0	1293	27	76	27	1118	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	57	134	0	1361	28	80	28	1177	0

Major/Minor	Minor1			Major1				Major2			
Conflicting Flow All	-	-	695	859	1177	0	0	1014	1389	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	330	526	321	-	-	432	253	-	0
Stage 1	0	0	-	-	-	-	-	-	-	-	0
Stage 2	0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %						-	-			-	
Mov Cap-1 Maneuver	-	0	330	526	526	-	-	325	325	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	1.2	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	526	-	-	330	325	-
HCM Lane V/C Ratio	0.254	-	-	0.172	0.334	-
HCM Control Delay (s)	14.2	-	-	18.2	21.5	-
HCM Lane LOS	B	-	-	C	C	-
HCM 95th %tile Q(veh)	1	-	-	0.6	1.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	58	0	112	27	0	16	103	76	1204	27	27	989
Future Volume (veh/h)	58	0	112	27	0	16	103	76	1204	27	27	989
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1811	1870	1811	1870	1870	1870		1811	1811	1870	1870	1811
Adj Flow Rate, veh/h	61	0	118	28	0	17		80	1267	28	28	1041
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
Percent Heavy Veh, %	6	2	6	2	2	2		6	6	2	2	6
Cap, veh/h	292	0	173	167	21	55		106	2768	61	55	2600
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11		0.06	0.56	0.56	0.03	0.53
Sat Flow, veh/h	1522	0	1535	617	188	489		1725	4977	110	1781	4944
Grp Volume(v), veh/h	61	0	118	45	0	0		80	839	456	28	1041
Grp Sat Flow(s),veh/h/ln	1522	0	1535	1295	0	0		1725	1648	1791	1781	1648
Q Serve(g_s), s	0.0	0.0	4.4	0.3	0.0	0.0		2.7	9.1	9.1	0.9	7.6
Cycle Q Clear(g_c), s	1.9	0.0	4.4	2.2	0.0	0.0		2.7	9.1	9.1	0.9	7.6
Prop In Lane	1.00		1.00	0.62		0.38		1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	292	0	173	243	0	0		106	1833	996	55	2600
V/C Ratio(X)	0.21	0.00	0.68	0.18	0.00	0.00		0.76	0.46	0.46	0.51	0.40
Avail Cap(c_a), veh/h	553	0	460	501	0	0		172	1833	996	148	2600
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	25.6	24.4	0.0	0.0		27.7	7.9	7.9	28.6	8.5
Incr Delay (d2), s/veh	0.4	0.0	4.7	0.4	0.0	0.0		10.4	0.8	1.5	7.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	0.6	0.0	0.0		1.3	2.5	2.9	0.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	30.2	24.7	0.0	0.0		38.1	8.8	9.4	35.6	9.0
LnGrp LOS	C	A	C	C	A	A		D	A	A	D	A
Approach Vol, veh/h		179			45				1375			1156
Approach Delay, s/veh		28.4			24.7				10.7			9.5
Approach LOS		C			C				B			A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	39.4		12.8	9.7	37.5		12.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	19.0		18.0	6.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	2.9	11.1		6.4	4.7	9.6		4.2				
Green Ext Time (p_c), s	0.0	4.7		0.5	0.0	4.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									
Notes												

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	83
Future Volume (veh/h)	83
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1811
Adj Flow Rate, veh/h	87
Peak Hour Factor	0.95
Percent Heavy Veh, %	6
Cap, veh/h	807
Arrive On Green	0.53
Sat Flow, veh/h	1535
Grp Volume(v), veh/h	87
Grp Sat Flow(s),veh/h/ln	1535
Q Serve(g_s), s	1.7
Cycle Q Clear(g_c), s	1.7
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	807
V/C Ratio(X)	0.11
Avail Cap(c_a), veh/h	807
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	7.2
Incr Delay (d2), s/veh	0.3
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.5
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	7.4
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer - Assigned Phs

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	68	0	0	41	32	2306	7	26	40	2709	53
Future Vol, veh/h	0	0	68	0	0	41	32	2306	7	26	40	2709	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	150	-	150	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	72	0	0	43	34	2427	7	27	42	2852	56

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	-	-	1426	-	-	1214	2908	0	0	1772	2434	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	-	-	7.14	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	-	-	3.92	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	107	0	0	149	42	-	-	162	75	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	-	-	107	-	-	149	42	-	-	87	87	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	89.4	38.7	3.1	3
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	42	-	-	107	149	87	-	-
HCM Lane V/C Ratio	0.802	-	-	0.669	0.29	0.799	-	-
HCM Control Delay (s)	227.6	-	-	89.4	38.7	130	-	-
HCM Lane LOS	F	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	3.1	-	-	3.4	1.1	4.1	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	0	83	0	2353	0	70	0	2772	0
Future Vol, veh/h	0	0	0	0	0	0	83	0	2353	0	70	0	2772	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	0	0	0	0	87	0	2477	0	74	0	2918	0

Major/Minor				Minor1			Major1				Major2			
Conflicting Flow All				-	-	1239	2130	2918	0	0	1808	2477	0	0
Stage 1				-	-	-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver				0	0	143	101	42	-	-	155	71	-	0
Stage 1				0	0	-	-	-	-	-	-	-	-	0
Stage 2				0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %									-	-			-	
Mov Cap-1 Maneuver				-	0	143	101	101	-	-	155	155	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	4.5	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	101	-	-	-	155	-
HCM Lane V/C Ratio	0.865	-	-	-	0.475	-
HCM Control Delay (s)	131.9	-	-	0	47.7	-
HCM Lane LOS	F	-	-	A	E	-
HCM 95th %tile Q(veh)	4.9	-	-	-	2.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	54	0	82	25	0	34	70	93	2244	25	25	2720
Future Volume (veh/h)	54	0	82	25	0	34	70	93	2244	25	25	2720
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1826	1870	1826	1870	1870	1870		1826	1826	1870	1870	1826
Adj Flow Rate, veh/h	57	0	86	26	0	36		98	2362	26	26	2863
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
Percent Heavy Veh, %	5	2	5	2	2	2		5	5	2	2	5
Cap, veh/h	180	0	125	75	14	53		123	3626	40	46	3331
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08		0.07	0.71	0.71	0.03	0.67
Sat Flow, veh/h	1334	0	1547	298	177	657		1739	5083	56	1781	4985
Grp Volume(v), veh/h	57	0	86	62	0	0		98	1543	845	26	2863
Grp Sat Flow(s),veh/h/ln	1334	0	1547	1132	0	0		1739	1662	1816	1781	1662
Q Serve(g_s), s	0.0	0.0	5.4	1.8	0.0	0.0		5.5	24.8	24.9	1.4	44.8
Cycle Q Clear(g_c), s	4.1	0.0	5.4	6.0	0.0	0.0		5.5	24.8	24.9	1.4	44.8
Prop In Lane	1.00		1.00	0.42		0.58		1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	180	0	125	143	0	0		123	2371	1295	46	3331
V/C Ratio(X)	0.32	0.00	0.69	0.43	0.00	0.00		0.80	0.65	0.65	0.57	0.86
Avail Cap(c_a), veh/h	316	0	279	287	0	0		157	2371	1295	89	3331
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	44.7	44.8	0.0	0.0		45.8	7.7	7.7	48.2	12.9
Incr Delay (d2), s/veh	1.0	0.0	6.5	2.1	0.0	0.0		19.5	1.4	2.6	10.6	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.3	1.6	0.0	0.0		3.0	7.1	8.2	0.8	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	0.0	51.2	46.9	0.0	0.0		65.3	9.1	10.2	58.7	16.1
LnGrp LOS	D	A	D	D	A	A		E	A	B	E	B
Approach Vol, veh/h		143			62				2486			2936
Approach Delay, s/veh		48.8			46.9				11.7			16.3
Approach LOS		D			D				B			B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.3		14.1	13.1	72.8		14.1				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	59.0		18.0	9.0	55.0		18.0				
Max Q Clear Time (g_c+I1), s	3.4	26.9		7.4	7.5	46.8		8.0				
Green Ext Time (p_c), s	0.0	23.0		0.4	0.0	7.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Notes

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	45
Future Volume (veh/h)	45
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1826
Adj Flow Rate, veh/h	47
Peak Hour Factor	0.95
Percent Heavy Veh, %	5
Cap, veh/h	1034
Arrive On Green	0.67
Sat Flow, veh/h	1547
Grp Volume(v), veh/h	47
Grp Sat Flow(s),veh/h/ln	1547
Q Serve(g_s), s	1.0
Cycle Q Clear(g_c), s	1.0
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	1034
V/C Ratio(X)	0.05
Avail Cap(c_a), veh/h	1034
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	5.7
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.3
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	5.8
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Intersection													
Int Delay, s/veh	49.7												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	0	317	0	0	185	91	2797	15	66	90	2176	143
Future Vol, veh/h	0	0	317	0	0	185	91	2797	15	66	90	2176	143
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	150	-	150	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	334	0	0	195	96	2944	16	69	95	2291	151

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	-	-	1146	-	-	1472	2442	0	0	2149	2960	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	-	-	7.14	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	-	-	3.92	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	~ 166	0	0	~ 99	~ 74	-	-	99	~ 40	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-
Platoon blocked, %								-	-			-	-
Mov Cap-1 Maneuver	-	-	~ 166	-	-	~ 99	~ 74	-	-	~ -5	~ -5	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 520.9	$ 541	9.4	
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 74	-	-	166	99	+	-	-
HCM Lane V/C Ratio	1.294	-	-	2.01	1.967	-	-	-
HCM Control Delay (s)	$ 300.8	-	-	$ 520.9	$ 541	-	-	-
HCM Lane LOS	F	-	-	F	F	-	-	-
HCM 95th %tile Q(veh)	7.5	-	-	25.8	16.4	-	-	-

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

Intersection	
Int Delay, s/veh	40.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	64	158	0	2814	32	90	32	2328	0
Future Vol, veh/h	0	0	0	0	0	64	158	0	2814	32	90	32	2328	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	0	0	0	67	166	0	2962	34	95	34	2451	0

Major/Minor				Minor1			Major1				Major2			
Conflicting Flow All				-	-	1498	1789	2451	0	0	2187	2996	0	0
Stage 1				-	-	-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver				0	0	95	~ 159	73	-	-	~ 94	38	-	0
Stage 1				0	0	-	-	-	-	-	-	-	-	0
Stage 2				0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %									-	-			-	
Mov Cap-1 Maneuver				-	0	95	~ 159	159	-	-	~ 33	~ 33	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	105.4	7.5	78.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	159	-	-	95	~ 33	-
HCM Lane V/C Ratio	1.046	-	-	0.709	3.892	-
HCM Control Delay (s)	141.7	-	-	105.4	$ 1574.1	-
HCM Lane LOS	F	-	-	F	F	-
HCM 95th %tile Q(veh)	8.4	-	-	3.6	15.1	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	68	0	132	32	0	16	122	89	2710	32	32	2183
Future Volume (veh/h)	68	0	132	32	0	16	122	89	2710	32	32	2183
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1826	1870	1826	1870	1870	1870		1826	1826	1870	1870	1826
Adj Flow Rate, veh/h	72	0	139	34	0	17		94	2853	34	34	2298
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
Percent Heavy Veh, %	5	2	5	2	2	2		5	5	2	2	5
Cap, veh/h	246	0	178	129	13	38		120	3317	39	57	3071
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11		0.07	0.65	0.65	0.03	0.62
Sat Flow, veh/h	1448	0	1547	545	113	329		1739	5078	60	1781	4985
Grp Volume(v), veh/h	72	0	139	51	0	0		94	1863	1024	34	2298
Grp Sat Flow(s),veh/h/ln	1448	0	1547	987	0	0		1739	1662	1815	1781	1662
Q Serve(g_s), s	0.0	0.0	7.9	1.9	0.0	0.0		4.8	39.8	40.4	1.7	29.6
Cycle Q Clear(g_c), s	4.1	0.0	7.9	6.0	0.0	0.0		4.8	39.8	40.4	1.7	29.6
Prop In Lane	1.00		1.00	0.67		0.33		1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	246	0	178	180	0	0		120	2171	1186	57	3071
V/C Ratio(X)	0.29	0.00	0.78	0.28	0.00	0.00		0.78	0.86	0.86	0.60	0.75
Avail Cap(c_a), veh/h	365	0	309	294	0	0		232	2171	1186	99	3071
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	38.7	38.1	0.0	0.0		41.2	12.3	12.4	43.0	12.3
Incr Delay (d2), s/veh	0.7	0.0	7.3	0.9	0.0	0.0		10.6	4.7	8.4	9.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	3.3	1.1	0.0	0.0		2.3	12.8	15.3	0.9	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	46.0	38.9	0.0	0.0		51.8	17.0	20.8	52.8	14.0
LnGrp LOS	D	A	D	D	A	A		D	B	C	D	B
Approach Vol, veh/h		211			51				2981			2435
Approach Delay, s/veh		43.2			38.9				19.4			14.3
Approach LOS		D			D				B			B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	64.8		16.3	12.2	61.4		16.3				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	12.0	42.0		18.0				
Max Q Clear Time (g_c+I1), s	3.7	42.4		9.9	6.8	31.6		8.0				
Green Ext Time (p_c), s	0.0	6.3		0.5	0.1	9.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.3									
HCM 6th LOS			B									

Notes

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	98
Future Volume (veh/h)	98
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1826
Adj Flow Rate, veh/h	103
Peak Hour Factor	0.95
Percent Heavy Veh, %	5
Cap, veh/h	953
Arrive On Green	0.62
Sat Flow, veh/h	1547
Grp Volume(v), veh/h	103
Grp Sat Flow(s),veh/h/ln	1547
Q Serve(g_s), s	2.5
Cycle Q Clear(g_c), s	2.5
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	953
V/C Ratio(X)	0.11
Avail Cap(c_a), veh/h	953
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	7.1
Incr Delay (d2), s/veh	0.2
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.8
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	7.3
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer - Assigned Phs

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	0	90	0	1056	0	56	0	1244	0
Future Vol, veh/h	0	0	0	0	0	0	90	0	1056	0	56	0	1244	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	6	2	2	2	6	2
Mvmt Flow	0	0	0	0	0	0	95	0	1112	0	59	0	1309	0

Major/Minor	Minor1			Major1				Major2			
Conflicting Flow All	-	-	556	956	1309	0	0	811	1112	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	406	465	277	-	-	559	345	-	0
Stage 1	0	0	-	-	-	-	-	-	-	-	0
Stage 2	0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %						-	-			-	
Mov Cap-1 Maneuver	-	0	406	465	465	-	-	559	559	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	1.2	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	465	-	-	-	559	-
HCM Lane V/C Ratio	0.204	-	-	-	0.105	-
HCM Control Delay (s)	14.7	-	-	0	12.2	-
HCM Lane LOS	B	-	-	A	B	-
HCM 95th %tile Q(veh)	0.8	-	-	-	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	44	0	59	20	0	28	56	77	967	20	20	1174
Future Volume (veh/h)	44	0	59	20	0	28	56	77	967	20	20	1174
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1811	1870	1811	1870	1870	1870		1811	1811	1870	1870	1811
Adj Flow Rate, veh/h	46	0	62	21	0	29		81	1018	21	21	1236
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
Percent Heavy Veh, %	6	2	6	2	2	2		6	6	2	2	6
Cap, veh/h	242	0	119	118	12	61		106	2982	61	44	2773
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08		0.06	0.60	0.60	0.02	0.56
Sat Flow, veh/h	1580	0	1535	423	150	790		1725	4986	103	1781	4944
Grp Volume(v), veh/h	46	0	62	50	0	0		81	673	366	21	1236
Grp Sat Flow(s),veh/h/ln	1580	0	1535	1363	0	0		1725	1648	1793	1781	1648
Q Serve(g_s), s	0.0	0.0	2.3	0.8	0.0	0.0		2.8	6.2	6.2	0.7	8.8
Cycle Q Clear(g_c), s	1.5	0.0	2.3	2.3	0.0	0.0		2.8	6.2	6.2	0.7	8.8
Prop In Lane	1.00		1.00	0.42		0.58		1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	242	0	119	191	0	0		106	1971	1072	44	2773
V/C Ratio(X)	0.19	0.00	0.52	0.26	0.00	0.00		0.76	0.34	0.34	0.48	0.45
Avail Cap(c_a), veh/h	550	0	460	518	0	0		172	1971	1072	148	2773
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	26.6	26.5	0.0	0.0		27.7	6.1	6.1	28.9	7.7
Incr Delay (d2), s/veh	0.4	0.0	3.5	0.7	0.0	0.0		10.6	0.5	0.9	7.9	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
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.7	0.0	0.0		1.4	1.6	1.8	0.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	0.0	30.1	27.3	0.0	0.0		38.3	6.6	7.0	36.8	8.2
LnGrp LOS	C	A	C	C	A	A		D	A	A	D	A
Approach Vol, veh/h		108			50				1120			1297
Approach Delay, s/veh		28.6			27.3				9.0			8.6
Approach LOS		C			C				A			A

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	41.9		10.6	9.7	39.7		10.6
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	19.0		18.0	6.0	18.0		18.0
Max Q Clear Time (g_c+I1), s	2.7	8.2		4.3	4.8	10.8		4.3
Green Ext Time (p_c), s	0.0	4.7		0.3	0.0	4.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	38
Future Volume (veh/h)	38
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1811
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.95
Percent Heavy Veh, %	6
Cap, veh/h	861
Arrive On Green	0.56
Sat Flow, veh/h	1535
Grp Volume(v), veh/h	40
Grp Sat Flow(s),veh/h/ln	1535
Q Serve(g_s), s	0.7
Cycle Q Clear(g_c), s	0.7
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	861
V/C Ratio(X)	0.05
Avail Cap(c_a), veh/h	861
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	5.9
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.2
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	6.0
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer - Assigned Phs

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	54	199	0	1293	27	76	27	1118	0
Future Vol, veh/h	0	0	0	0	0	54	199	0	1293	27	76	27	1118	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	57	209	0	1361	28	80	28	1177	0

Major/Minor	Minor1			Major1				Major2			
Conflicting Flow All	-	-	695	859	1177	0	0	1014	1389	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	330	526	321	-	-	432	253	-	0
Stage 1	0	0	-	-	-	-	-	-	-	-	0
Stage 2	0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %						-	-			-	
Mov Cap-1 Maneuver	-	0	330	526	526	-	-	325	325	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	2.1	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	526	-	-	330	325	-
HCM Lane V/C Ratio	0.398	-	-	0.172	0.334	-
HCM Control Delay (s)	16.3	-	-	18.2	21.5	-
HCM Lane LOS	C	-	-	C	C	-
HCM 95th %tile Q(veh)	1.9	-	-	0.6	1.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	58	0	112	27	0	16	103	76	1204	27	27	989
Future Volume (veh/h)	58	0	112	27	0	16	103	76	1204	27	27	989
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1811	1870	1811	1870	1870	1870		1811	1811	1870	1870	1811
Adj Flow Rate, veh/h	61	0	118	28	0	17		80	1267	28	28	1041
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
Percent Heavy Veh, %	6	2	6	2	2	2		6	6	2	2	6
Cap, veh/h	292	0	173	167	21	55		106	2768	61	55	2600
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11		0.06	0.56	0.56	0.03	0.53
Sat Flow, veh/h	1522	0	1535	617	188	489		1725	4977	110	1781	4944
Grp Volume(v), veh/h	61	0	118	45	0	0		80	839	456	28	1041
Grp Sat Flow(s),veh/h/ln	1522	0	1535	1295	0	0		1725	1648	1791	1781	1648
Q Serve(g_s), s	0.0	0.0	4.4	0.3	0.0	0.0		2.7	9.1	9.1	0.9	7.6
Cycle Q Clear(g_c), s	1.9	0.0	4.4	2.2	0.0	0.0		2.7	9.1	9.1	0.9	7.6
Prop In Lane	1.00		1.00	0.62		0.38		1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	292	0	173	243	0	0		106	1833	996	55	2600
V/C Ratio(X)	0.21	0.00	0.68	0.18	0.00	0.00		0.76	0.46	0.46	0.51	0.40
Avail Cap(c_a), veh/h	553	0	460	501	0	0		172	1833	996	148	2600
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	25.6	24.4	0.0	0.0		27.7	7.9	7.9	28.6	8.5
Incr Delay (d2), s/veh	0.4	0.0	4.7	0.4	0.0	0.0		10.4	0.8	1.5	7.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	0.6	0.0	0.0		1.3	2.5	2.9	0.5	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	0.0	30.2	24.7	0.0	0.0		38.1	8.8	9.4	35.6	9.0
LnGrp LOS	C	A	C	C	A	A		D	A	A	D	A
Approach Vol, veh/h		179			45				1375			1156
Approach Delay, s/veh		28.4			24.7				10.7			9.5
Approach LOS		C			C				B			A
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	39.4		12.8	9.7	37.5		12.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	19.0		18.0	6.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	2.9	11.1		6.4	4.7	9.6		4.2				
Green Ext Time (p_c), s	0.0	4.7		0.5	0.0	4.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									
Notes												
User approved ignoring U-Turning movement.												

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	83
Future Volume (veh/h)	83
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1811
Adj Flow Rate, veh/h	87
Peak Hour Factor	0.95
Percent Heavy Veh, %	6
Cap, veh/h	807
Arrive On Green	0.53
Sat Flow, veh/h	1535
Grp Volume(v), veh/h	87
Grp Sat Flow(s),veh/h/ln	1535
Q Serve(g_s), s	1.7
Cycle Q Clear(g_c), s	1.7
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	807
V/C Ratio(X)	0.11
Avail Cap(c_a), veh/h	807
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	7.2
Incr Delay (d2), s/veh	0.3
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.5
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	7.4
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	0	115	0	2353	0	70	0	2772	0
Future Vol, veh/h	0	0	0	0	0	0	115	0	2353	0	70	0	2772	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	0	0	0	0	121	0	2477	0	74	0	2918	0

Major/Minor				Minor1			Major1				Major2			
Conflicting Flow All				-	-	1239	2130	2918	0	0	1808	2477	0	0
Stage 1				-	-	-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver				0	0	143	~ 101	42	-	-	155	71	-	0
Stage 1				0	0	-	-	-	-	-	-	-	-	0
Stage 2				0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %									-	-			-	
Mov Cap-1 Maneuver				-	0	143	~ 101	101	-	-	155	155	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	10.8	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	101	-	-	-	155	-
HCM Lane V/C Ratio	1.199	-	-	-	0.475	-
HCM Control Delay (s)	231	-	-	0	47.7	-
HCM Lane LOS	F	-	-	A	E	-
HCM 95th %tile Q(veh)	8.1	-	-	-	2.2	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	54	0	82	25	0	34	70	93	2244	25	25	2720
Future Volume (veh/h)	54	0	82	25	0	34	70	93	2244	25	25	2720
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1826	1870	1826	1870	1870	1870		1826	1826	1870	1870	1826
Adj Flow Rate, veh/h	57	0	86	26	0	36		98	2362	26	26	2863
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
Percent Heavy Veh, %	5	2	5	2	2	2		5	5	2	2	5
Cap, veh/h	180	0	125	75	14	53		123	3626	40	46	3331
Arrive On Green	0.08	0.00	0.08	0.08	0.00	0.08		0.07	0.71	0.71	0.03	0.67
Sat Flow, veh/h	1334	0	1547	298	177	657		1739	5083	56	1781	4985
Grp Volume(v), veh/h	57	0	86	62	0	0		98	1543	845	26	2863
Grp Sat Flow(s),veh/h/ln	1334	0	1547	1132	0	0		1739	1662	1816	1781	1662
Q Serve(g_s), s	0.0	0.0	5.4	1.8	0.0	0.0		5.5	24.8	24.9	1.4	44.8
Cycle Q Clear(g_c), s	4.1	0.0	5.4	6.0	0.0	0.0		5.5	24.8	24.9	1.4	44.8
Prop In Lane	1.00		1.00	0.42		0.58		1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	180	0	125	143	0	0		123	2371	1295	46	3331
V/C Ratio(X)	0.32	0.00	0.69	0.43	0.00	0.00		0.80	0.65	0.65	0.57	0.86
Avail Cap(c_a), veh/h	316	0	279	287	0	0		157	2371	1295	89	3331
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	44.7	44.8	0.0	0.0		45.8	7.7	7.7	48.2	12.9
Incr Delay (d2), s/veh	1.0	0.0	6.5	2.1	0.0	0.0		19.5	1.4	2.6	10.6	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	0.0	4.1	2.8	0.0	0.0		5.4	11.5	12.9	1.4	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	0.0	51.2	46.9	0.0	0.0		65.3	9.1	10.2	58.7	16.1
LnGrp LOS	D	A	D	D	A	A		E	A	B	E	B
Approach Vol, veh/h		143			62				2486			2936
Approach Delay, s/veh		48.8			46.9				11.7			16.3
Approach LOS		D			D				B			B

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.3		14.1	13.1	72.8		14.1				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	59.0		18.0	9.0	55.0		18.0				
Max Q Clear Time (g_c+I1), s	3.4	26.9		7.4	7.5	46.8		8.0				
Green Ext Time (p_c), s	0.0	23.0		0.4	0.0	7.9		0.1				

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

Notes

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	45
Future Volume (veh/h)	45
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1826
Adj Flow Rate, veh/h	47
Peak Hour Factor	0.95
Percent Heavy Veh, %	5
Cap, veh/h	1034
Arrive On Green	0.67
Sat Flow, veh/h	1547
Grp Volume(v), veh/h	47
Grp Sat Flow(s),veh/h/ln	1547
Q Serve(g_s), s	1.0
Cycle Q Clear(g_c), s	1.0
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	1034
V/C Ratio(X)	0.05
Avail Cap(c_a), veh/h	1034
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	5.7
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	0.6
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	5.8
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Intersection	
Int Delay, s/veh	51.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	0	0	0	64	249	0	2814	32	90	32	2328	0
Future Vol, veh/h	0	0	0	0	0	64	249	0	2814	32	90	32	2328	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	0	-	150	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	5	2	2	2	5	2
Mvmt Flow	0	0	0	0	0	67	262	0	2962	34	95	34	2451	0

Major/Minor	Minor1			Major1				Major2			
Conflicting Flow All	-	-	1498	1789	2451	0	0	2187	2996	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.14	5.64	5.34	-	-	5.64	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.92	2.32	3.12	-	-	2.32	3.12	-	-
Pot Cap-1 Maneuver	0	0	95	~ 159	73	-	-	~ 94	38	-	0
Stage 1	0	0	-	-	-	-	-	-	-	-	0
Stage 2	0	0	-	-	-	-	-	-	-	-	0
Platoon blocked, %						-	-			-	
Mov Cap-1 Maneuver	-	0	95	~ 159	159	-	-	~ 33	~ 33	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	105.4	29.7	78.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	159	-	-	95	~ 33	-
HCM Lane V/C Ratio	1.648	-	-	0.709	3.892	-
HCM Control Delay (s)	$ 368.7	-	-	105.4	$ 1574.1	-
HCM Lane LOS	F	-	-	F	F	-
HCM 95th %tile Q(veh)	18.3	-	-	3.6	15.1	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	68	0	132	32	0	16	122	89	2710	32	32	2183
Future Volume (veh/h)	68	0	132	32	0	16	122	89	2710	32	32	2183
Initial Q (Qb), veh	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	
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
Work Zone On Approach		No			No				No			No
Adj Sat Flow, veh/h/ln	1826	1870	1826	1870	1870	1870		1826	1826	1870	1870	1826
Adj Flow Rate, veh/h	72	0	139	34	0	17		94	2853	34	34	2298
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
Percent Heavy Veh, %	5	2	5	2	2	2		5	5	2	2	5
Cap, veh/h	246	0	178	129	13	38		120	3317	39	57	3071
Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11		0.07	0.65	0.65	0.03	0.62
Sat Flow, veh/h	1448	0	1547	545	113	329		1739	5078	60	1781	4985
Grp Volume(v), veh/h	72	0	139	51	0	0		94	1863	1024	34	2298
Grp Sat Flow(s),veh/h/ln	1448	0	1547	987	0	0		1739	1662	1815	1781	1662
Q Serve(g_s), s	0.0	0.0	7.9	1.9	0.0	0.0		4.8	39.8	40.4	1.7	29.6
Cycle Q Clear(g_c), s	4.1	0.0	7.9	6.0	0.0	0.0		4.8	39.8	40.4	1.7	29.6
Prop In Lane	1.00		1.00	0.67		0.33		1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	246	0	178	180	0	0		120	2171	1186	57	3071
V/C Ratio(X)	0.29	0.00	0.78	0.28	0.00	0.00		0.78	0.86	0.86	0.60	0.75
Avail Cap(c_a), veh/h	365	0	309	294	0	0		232	2171	1186	99	3071
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
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	38.7	38.1	0.0	0.0		41.2	12.3	12.4	43.0	12.3
Incr Delay (d2), s/veh	0.7	0.0	7.3	0.9	0.0	0.0		10.6	4.7	8.4	9.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	0.0	5.9	2.0	0.0	0.0		4.2	18.6	21.7	1.6	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	46.0	38.9	0.0	0.0		51.8	17.0	20.8	52.8	14.0
LnGrp LOS	D	A	D	D	A	A		D	B	C	D	B
Approach Vol, veh/h		211			51				2981			2435
Approach Delay, s/veh		43.2			38.9				19.4			14.3
Approach LOS		D			D				B			B

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	64.8		16.3	12.2	61.4		16.3				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	12.0	42.0		18.0				
Max Q Clear Time (g_c+I1), s	3.7	42.4		9.9	6.8	31.6		8.0				
Green Ext Time (p_c), s	0.0	6.3		0.5	0.1	9.1		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			18.3
HCM 6th LOS			B

Notes

User approved ignoring U-Turning movement.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	98
Future Volume (veh/h)	98
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1826
Adj Flow Rate, veh/h	103
Peak Hour Factor	0.95
Percent Heavy Veh, %	5
Cap, veh/h	953
Arrive On Green	0.62
Sat Flow, veh/h	1547
Grp Volume(v), veh/h	103
Grp Sat Flow(s),veh/h/ln	1547
Q Serve(g_s), s	2.5
Cycle Q Clear(g_c), s	2.5
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	953
V/C Ratio(X)	0.11
Avail Cap(c_a), veh/h	953
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	7.1
Incr Delay (d2), s/veh	0.2
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(95%),veh/ln	1.4
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	7.3
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	