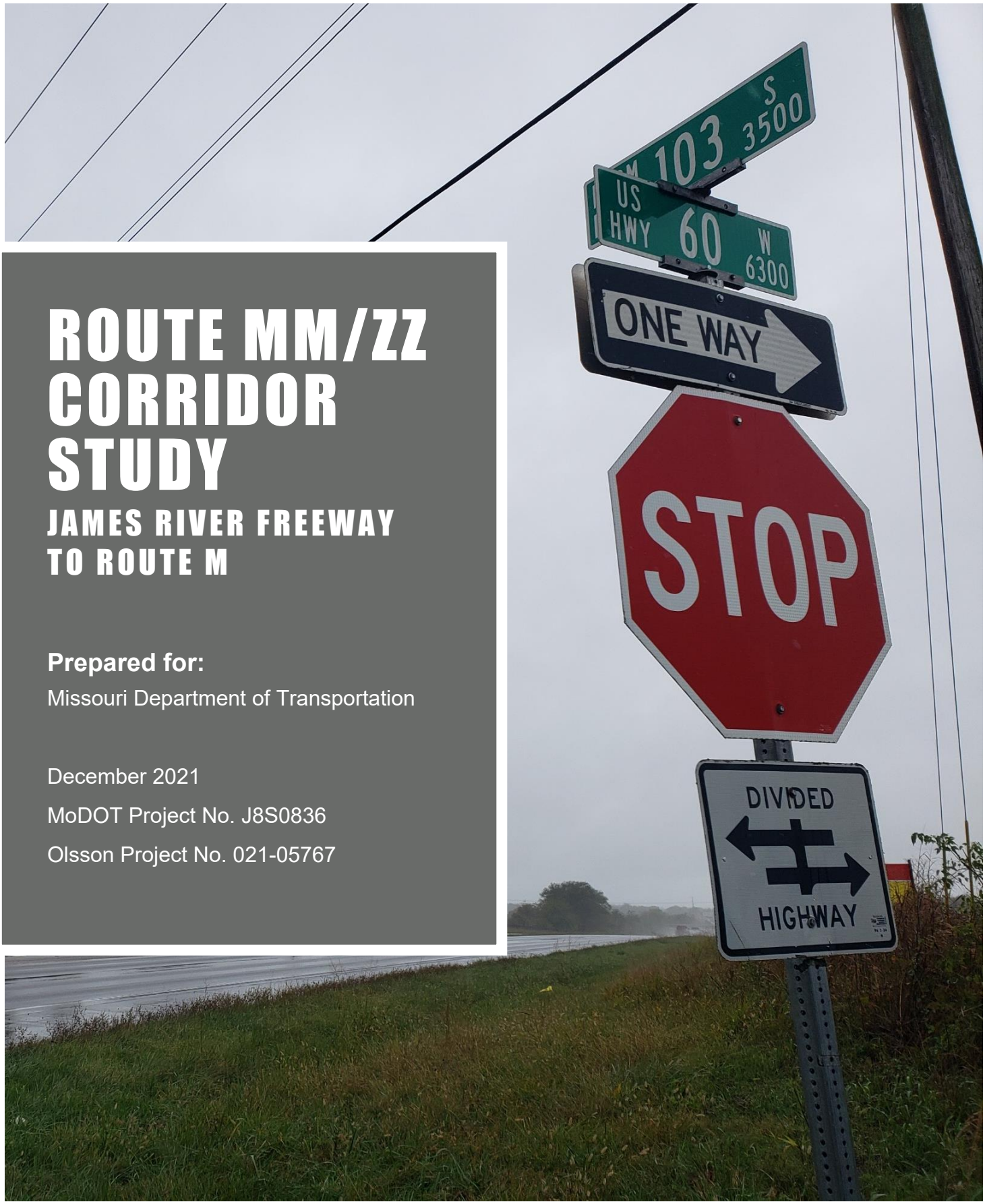

ROUTE MM/ZZ CORRIDOR STUDY

JAMES RIVER FREEWAY TO ROUTE M

Prepared for:

Missouri Department of Transportation

December 2021

MoDOT Project No. J8S0836

Olsson Project No. 021-05767

olsson®

OZARKS TRANSPORTATION ORGANIZATION
A METROPOLITAN PLANNING ORGANIZATION

REPUBLIC MISSOURI

MoDOT

EXECUTIVE SUMMARY

The purpose and need of this project are to provide traffic analysis, modeling, and forecasting with recommendations for staged project implementation of the conceptual Route MM corridor alignment to meet projected forecasts. This report summarizes the analysis associated with the proposed realignment of Route MM in Republic, Missouri. This realignment would include two rail overpasses and coincide with the closure of multiple at-grade rail crossings in the area. Considering that this corridor is a critical north-south connector for the region and is experiencing significant development activity in its vicinity, it is important to consider how the future demands can be accommodated to preserve the integrity of the corridor for all users.

Considering that this corridor is a critical north-south connector for the region and is experiencing significant development activity in its vicinity, it is important to consider how the future demands can be accommodated to preserve the integrity of the corridor for all users.

The existing conditions pertaining to the capacity, safety, and roadway and bridge design considerations of the current alignment are described as well as the expected constraints for the future no-build scenario if no improvements are made. In order to determine the future needs of the corridor, the Ozarks Transportation Organization's (OTO) travel demand model was updated to include the expected development interests within the study area.

Four baseline alternatives were considered for the future cross-section of the realigned Route MM: three-lane vs five-lane section and partial build vs full build alignment. Under the partial build alignment, the realignment of Route MM between Farm Road 160 and US 60 would initially be constructed and tie into Farm Road 103. Full build alignment would continue the realignment south of US 60 and directly tie into Route ZZ rather than Farm Road 103. Based on the findings of this study, Farm Road 103 would quickly reach capacity under the Partial Build alignment. Thus, it was determined that the Full Build alignment would be preferred. Based on the projected traffic volumes, a five-lane cross-section is expected to be needed along Route MM north of US 60 with a three-lane section along Route ZZ between US 60 and Route M.

Under this roadway configuration the expected 2045 design year average daily volumes for the Route MM/ZZ corridor are expected to range from 22,720 vehicles per day to 33,100 vehicles per day between James River Freeway and US 60. The highest ADTs are expected at the development access points nearest to these two main highways. Depending on how these areas develop and access is allowed, raised medians should also be considered immediately south of James River Freeway and immediately north of US 60 to control access points and increase capacity along Route MM. Route ZZ south of US 60 is expected to be approximately 12,250 vehicles per day by 2045 as a three-lane section.

If demand continues in the area as expected, this full build realignment could be programmed by the year 2027 given that Route MM three-lane capacities are expected to be reached between 2027-2032 north of US 60. South of US 60, the full build realignment is recommended as a three-lane roadway based on the volume projections. This section of Route ZZ is expected to be approximately 12,250 vpd, which is below the typical three-lane capacity, by the design year 2045.

The main connection points of the realigned Route MM corridor are at Farm Road 160, US 60, and Route ZZ. The intersection of Route MM and Farm Road 160 is expected to operate acceptably as a dual lane roundabout or signalized intersection, with the roundabout configuration resulting in the shortest delays and queues overall. Two viable roundabout configurations are presented, one of which includes a free westbound right-turn and is preferrable considering it is associated with expected lower delays and crash frequency. The intersection of Route MM and US 60 is anticipated to be signalized. If volumes materialize as expected, the intersection will be reaching capacity near 2045 and be in need of re-evaluation, potentially considering innovative intersection types to accommodate demand. The intersection of Route ZZ with Route M is expected to operate acceptably as a hybrid roundabout, a portion of which includes two circulating lanes to accommodate the heaviest movements.

A conceptual cost was also conducted for the anticipated facility types along the corridor. At the time of this report, appropriate cost estimate assumptions were still in discussions with MoDOT staff. A summary of the anticipated costs will be presented in a separate submittal document.

It is understood that construction of the conceptual corridor configuration may not be feasible until funding becomes available. The table below discusses potential traffic outcomes to consider when pairing the various Route MM realignment projects.

Scenario	Potential Outcome
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with Full Access	• Traffic expected to utilize FR 103 until capacity is reached (within 3 years of initial project completion assuming unimproved FR capacity of 5,000 vpd). • Once FR 103 capacity is reached, additional traffic likely to reroute to Rt M and US 60.
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with RIRO Access	• Traffic expected to reroute to Rt M and US 60. • Rt M between US 60 and Rt ZZ design year 2045 ADT increases to 12,840 vpd, potentially warranting widening to 3-lane if left-turn volumes are heavy. • US 60 between Rt M and “new” Rt MM design year 2045 ADT increases to 45,180 vpd. • According to OTO capacity thresholds, US 60 has a future capacity of 53,250 vpd. While not over capacity, increased congestion would be expected, and a weave scenario from Rt M, to US 60 to New Rt MM would be introduced. • FR 103 between US 60 and Rt M design year 2045 ADT of 3,620 vpd (3,300 vpd northbound).
J8S0836D Constructed, J8S0836A Not Constructed	• Traffic expected to utilize Rt MM until capacity is reached (possibly as early as 2027 north of FR 156 and 2032 south of FR 156). • Rt MM capacity north of FR 160 expected to be 17,500 vpd as a 3-lane roadway.

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1. INTRODUCTION AND OBJECTIVE

The Missouri Department of Transportation (MoDOT) contracted with Olsson to provide support for the Route MM corridor improvement project. The corridor project encompasses Route MM beginning at the Route 360/James River Freeway (referred through report as "James River Freeway" or simply "JRF") interchange, continuing south through US 60, and along Route M east through the roundabout at Farm Road 103. The existing Route MM corridor is being considered for realignment to the east which may include a railroad overpass, new signalized intersection with US 60, and two new roundabout intersections. The objectives of the project were to update the Ozarks Transportation Organization's (OTO) travel demand model and use it to conduct operational and safety analyses, determine an appropriate lane configuration for the railroad overpass bridge, and review projected costs. At the time of this report, appropriate cost estimate assumptions were still in discussions with MoDOT staff. A summary of the anticipated costs will be presented in a separate submittal document. The conceptual location of the corridor is illustrated on **Figure 1.**

The entire study corridor includes the following sub-sections. Additional sub-sections are also be discussed further, if applicable, later in the report:

- J8S0836A – Route MM between James River Freeway and Farm Road 160 with additional improvements south of Farm Road 160 as needed.
- J8S0836B – Route MM between I-44 and James River Freeway
    - (Planned project, but recommendations to this section are not directly included in the scope of this report)
- J8S0836C – Route ZZ between US 60 and Route M
- J8S0836D – Route MM between Farm Road 160 and US 60

1.1. Project Approach

The work phases included data collection, capacity and safety analyses, evaluation of corridor characteristics, and estimation of improvement costs.

MoDOT provided existing turning movement count data and historical crash data. MoDOT also designated three corridor classification options for consideration.

Historical crash data and Highway Safety Manual (HSM) crash prediction methodology were reviewed to identify existing crash patterns and to determine if the future intersection concepts (Route MM & Farm Road 160 roundabout, Route MM & US 60 signal, and Route ZZ & Route M roundabout) are expected to have a low number of crashes. The re-aligned highway segment was also evaluated to determine the appropriate cross section, three-lane or five-lane road/bridge, to accommodate existing and future traffic growth, and projected costs.

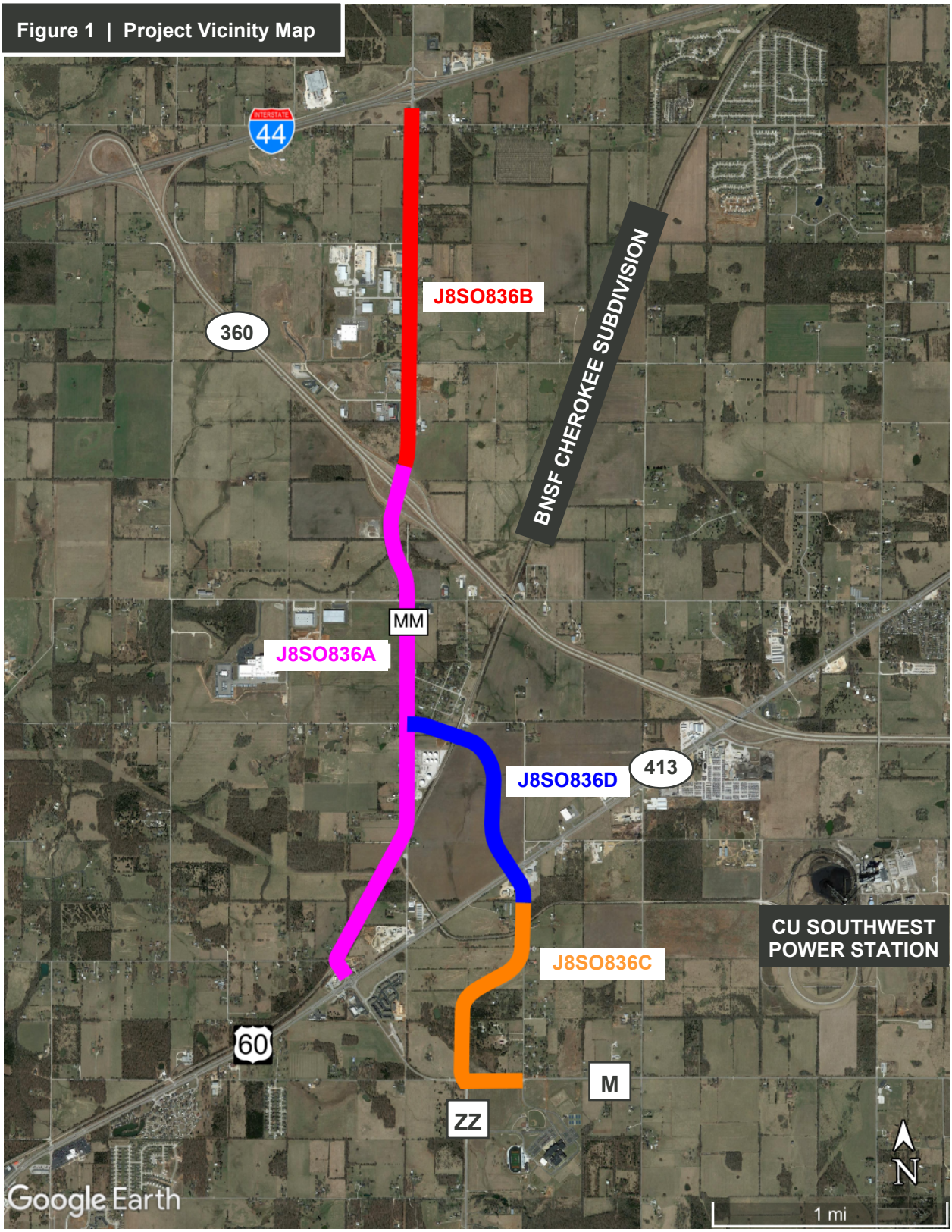


Figure 1. Project Vicinity Map

2. EXISTING CONDITIONS

A review of the existing conditions of the corridor was conducted. Existing turning movement counts (TMC) and annual average daily traffic (AADT) volumes were provided by MoDOT and/or utilized from recent traffic studies along the corridor. Historical crash data, crash rates, and record as-built drawings were also provided by MoDOT. A field review was conducted to identify possible safety or operational concerns along the corridor.

2.1. Traffic Volume and Operations

The traffic pattern along Route MM is development and commuter driven with heavier northbound traffic in the AM peak hour and predominantly southbound traffic in the PM peak hour. A noticeable eastbound traffic pattern was also observed in the AM along US 60, Route M, and JRF with westbound volumes heavier in the PM.

The 2020 AADT along Route MM between JRF and US 60 was approximately 7,830 vehicles per day (vpd) based on data provided on MoDOT's Datalink website.

Capacity analysis was performed for the existing corridor conditions using Synchro Version 11 for signalized and stop-controlled intersections, and Sidra Version 9.0 was used for roundabouts. Based on the existing capacity analysis, results are as follows:

US 60 & Route MM

The intersection of US 60 & Route MM operates at a LOS D during the AM peak hour and LOS F during the PM peak hour. Extensive mainline queueing occurs in the peak directions, eastbound in the AM and westbound in the PM. Mainline left-turning movements as well as side street operations are also at or near capacity. This is primarily due to the heavy commuter traffic (primarily eastbound in AM, westbound in PM) as well as heavy turning movement to and from Route MM. The US 60 corridor is being considered for widening to a 6-lane facility to provide additional capacity. The southbound approach also experiences delay with queueing that at times extends to the at-grade rail crossing, which is undesirable and presents a safety concern.

Route M & Route ZZ

The intersection of Route M & Route ZZ operates a LOS C during the AM peak hour and LOS D during the PM peak hour; however, heavy turning movements to/from the south and east legs of the intersection experience congestion at times. This is exemplified by the westbound left-turn movement which operates at a LOS E in the PM. This left-turn queue may not clear within a given cycle.

US 60 and Farm Road 103

The existing unsignalized intersection of US 60 and Farm Road 103 was also observed to experience poor levels of service for the stop-controlled minor street. Both the northbound and southbound approaches have a LOS F during the AM and PM peak hour periods.

Existing peak hour traffic conditions are illustrated in **Figures 2-4**.

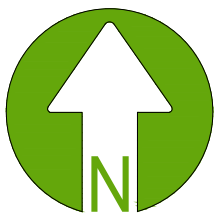
Traffic count data collected for this project is provided in **Appendix A**. Detailed capacity analysis results are provided in **Appendix B.**

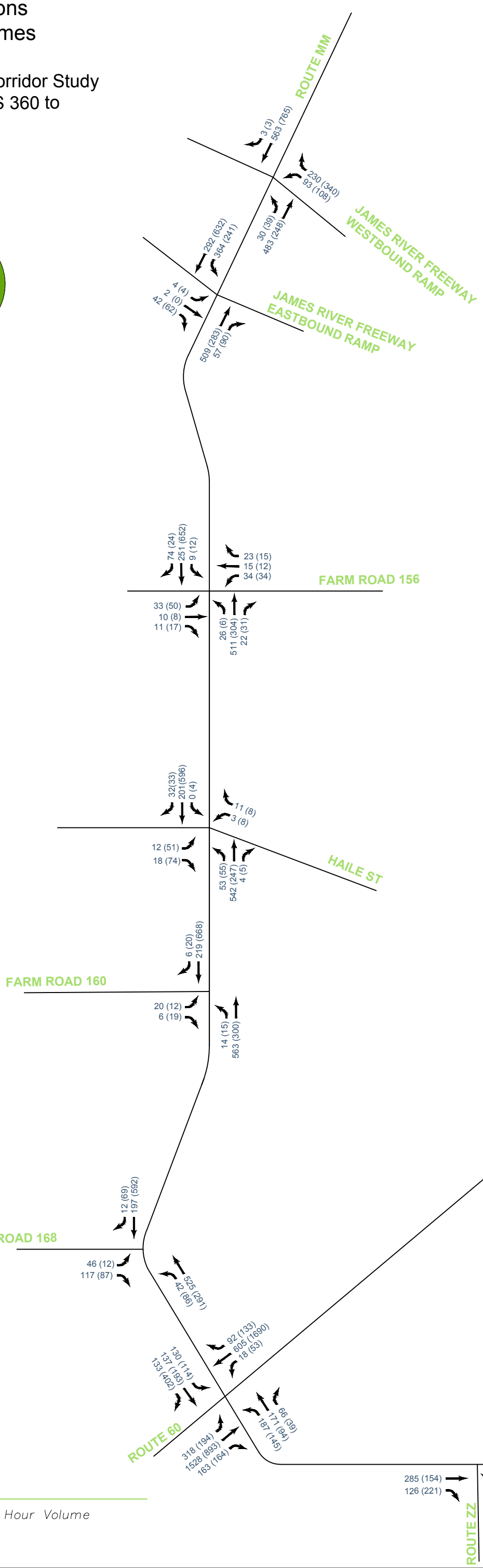
FIGURE 2

Existing Conditions
Peak Hour Volumes

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County





LEGEND

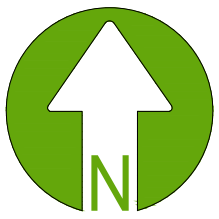
AM (PM) *Peak Hour Volume*

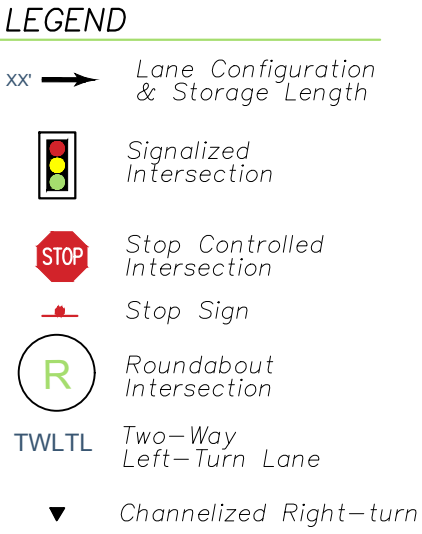
FIGURE 3

Existing Conditions
Lane Configuration and Traffic Control

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County





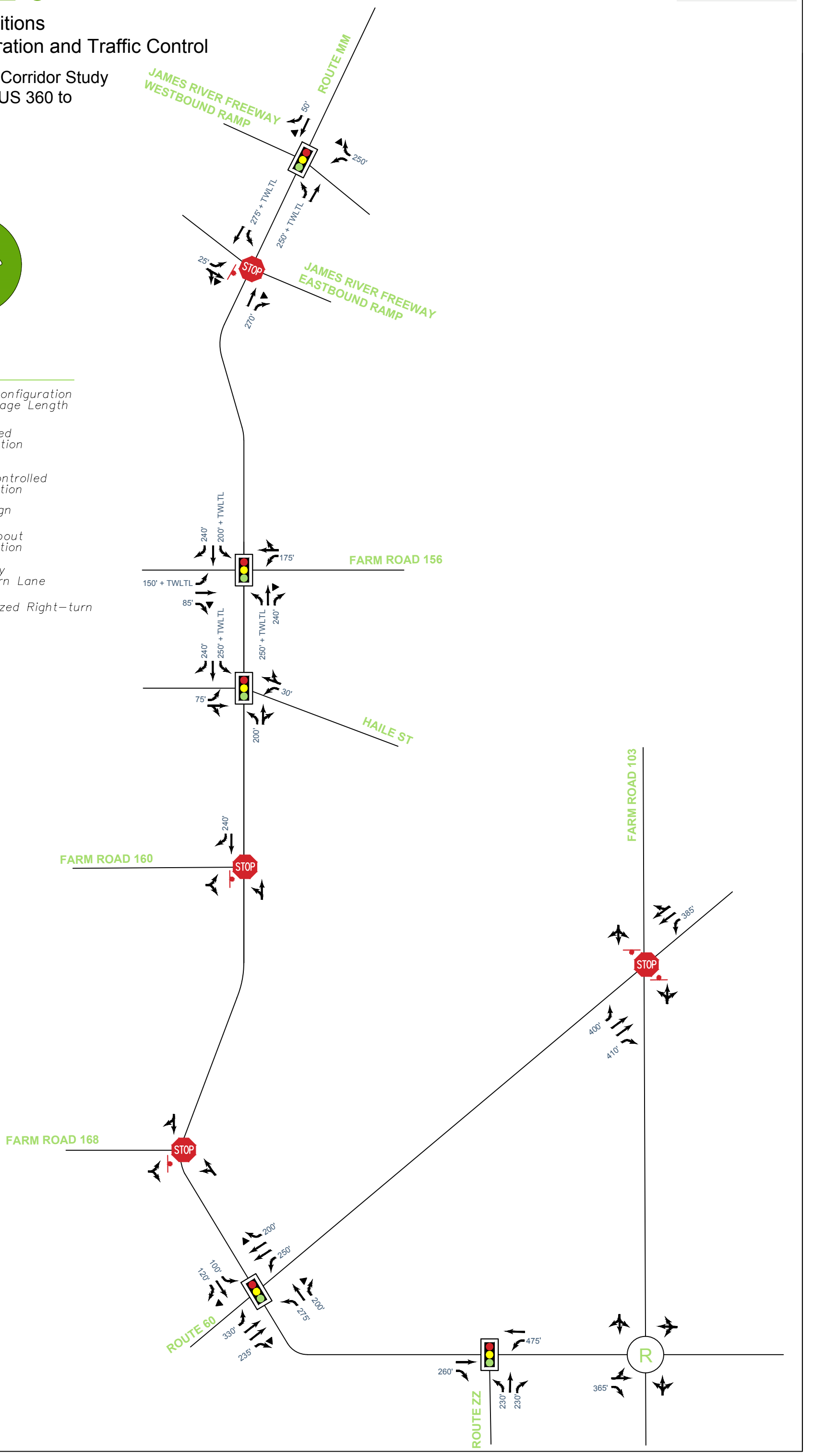
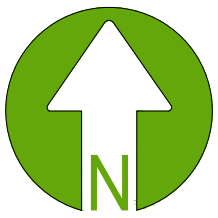


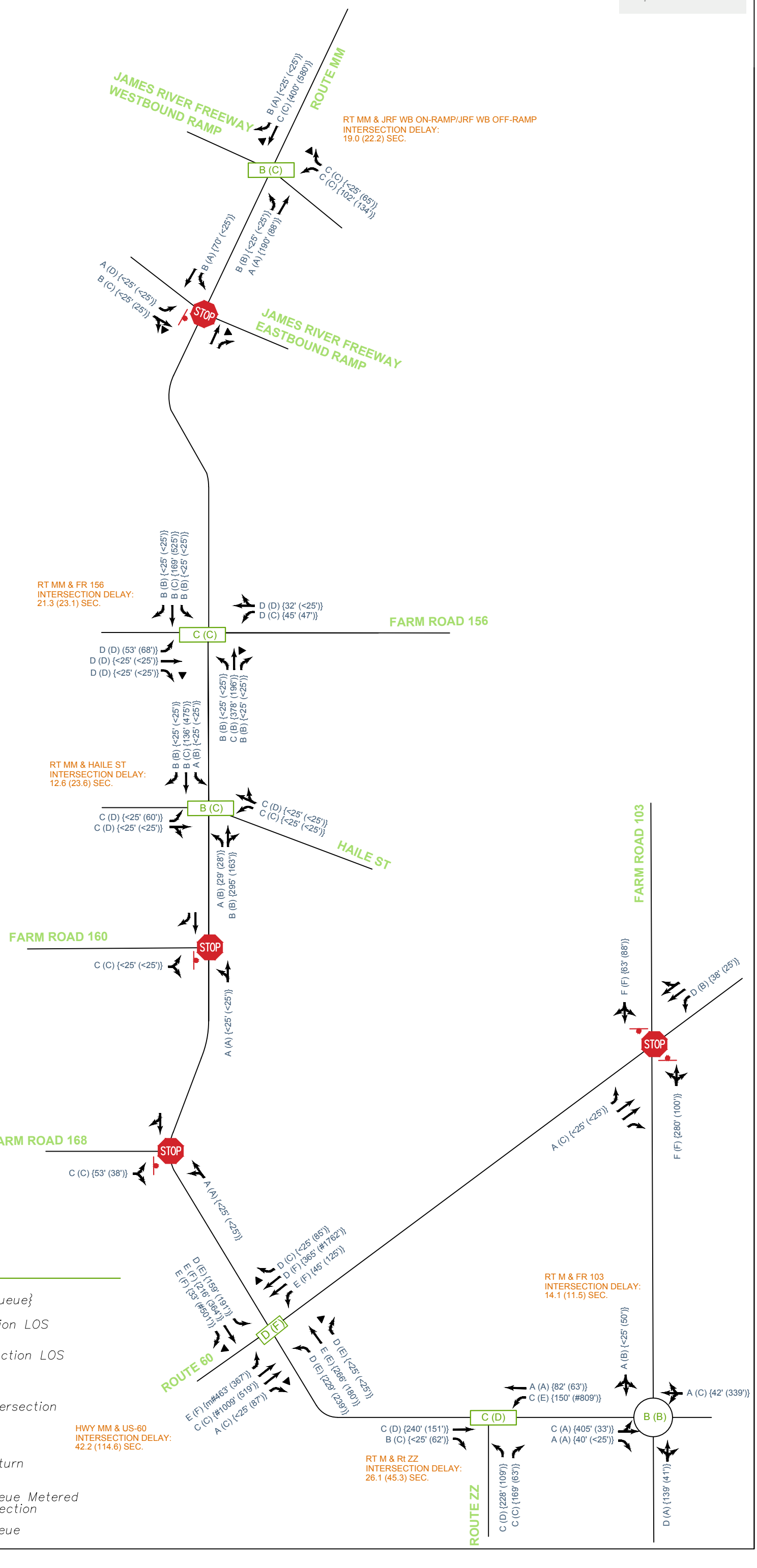
FIGURE 4

Existing Conditions
Capacity Analysis

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County





2.2. Existing Crashes

Crash data from 2015-2019 as well as partial year 2020-2021 were reviewed to identify “hot spots” within the corridor. A map of the existing hot spots is shown in **Figures 5** and **6**. This heat map shows the areas where crashes are most commonly occurring as well as the assigned location of all fatal and injury crashes reviewed for this study. A summary of the crash severity and crash type within the study area is shown in **Table 1**.

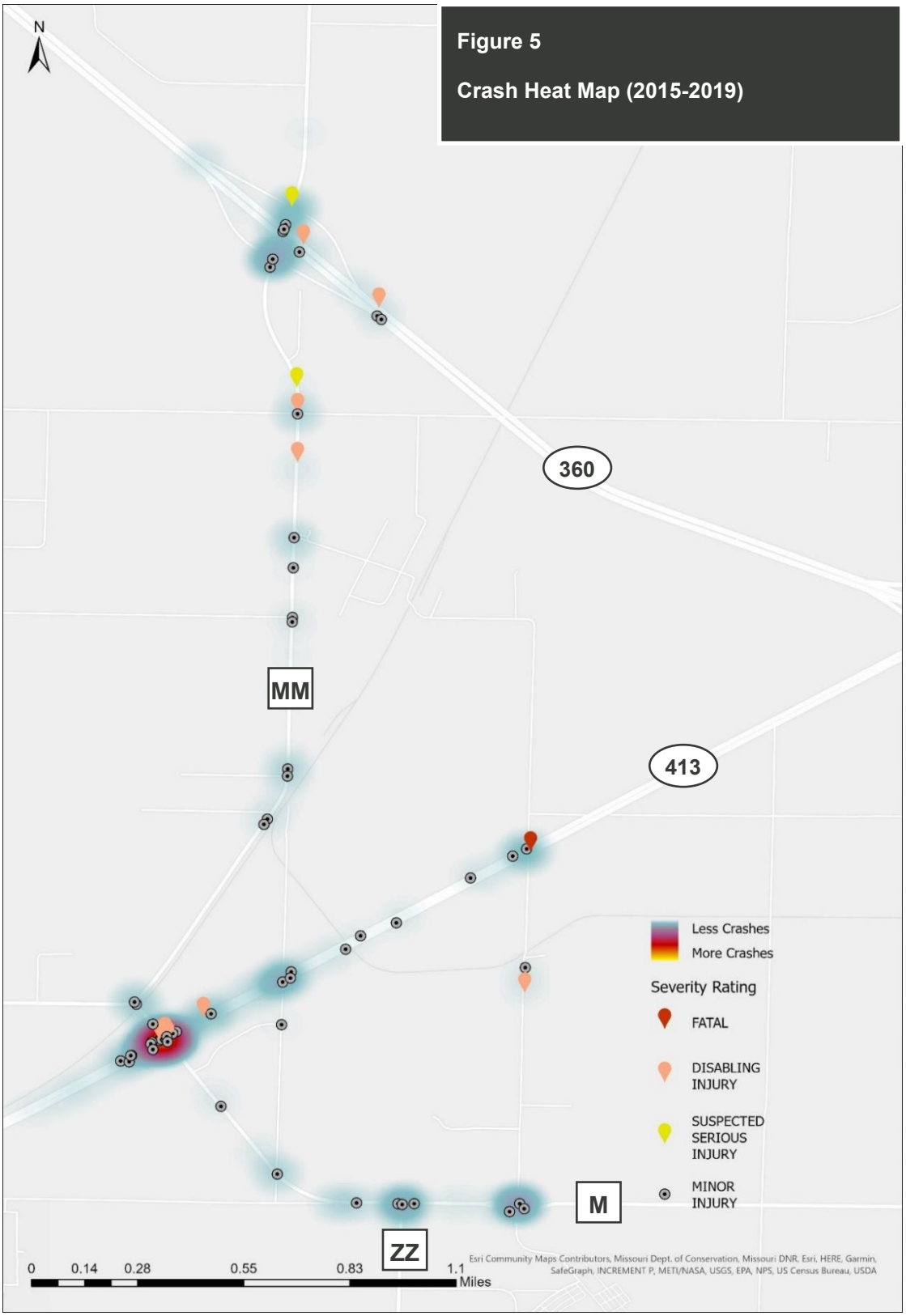


Figure 5. Crash Heat Map (2015-2019)

Figure 6. Crash Heat Map (Partial 2020-2021)

Table 1. Crash Summary Statistics.

	2015-2019 Crashes	2020-2021 Crashes
Crash Severity	74% PDO	68% PDO
	21% Minor Injury	27% Minor Injury
	4% Disabling or Suspected Serious Injury	3% Disabling or Suspected Serious Injury
	<1% Fatal	2% Fatal
Common Crash Types	50% Rear End	46% Rear End
	17% Angle, Left Turn, Left/Right Turn Right Angle	17% Angle, Left Turn, Left/Right Turn Right Angle
	15% Out of Control	18% Out of Control

Note: 2020-2021 crashes are partial years and/or not considered “official” at the time of this report.

Based on the information provided, crashes most commonly occurred at the following locations:

- US-60 & Route MM signalized intersection
  - A high proportion of these crashes were rear end crashes likely related to congestion at the intersection.
  - Injury crashes primarily were characterized as rear end, angle, passing, and head on collisions.
- Route M & Route ZZ signalized intersection
  - Mostly property damage only rear end crashes likely related to congestion at the intersection.
  - Injury crashes were mostly rear ends with one right angle.
- Route M & Farm Road 103 roundabout (constructed late 2019, unsignalized prior)
  - Crashes as an unsignalized intersection mostly included right angle, rear end, and out of control crashes.
  - Immediately after roundabout construction, primarily out of control crashes were observed. It is possible this is a result of the new construction, and the ultimate crash behavior post-construction is to be determined.
- US 60 & Farm Road 103
  - Included one fatal left turn right angle crash occurred at the unsignalized crossing.

- Route MM and James River Freeway Ramps
    - Westbound Ramp: Primarily left/right angle crashes, some of which resulted in injuries. A traffic signal was installed in 2021 which may reduce this crash type.
    - Eastbound Ramp: Included one fatal pedestrian crash where road/light conditions were poor. Multiple left/right turn injury crashes were also noted.
- Horizontal Curves of Route MM
    - Multiple out of control injury crashes. Many of these occur at the sharp, near 90-degree turn north of the rail crossing but were also observed at the curve south of Magellan Pipeline.

Crashes from 2020-2021 were generally more severe than those observed from 2015-2019. This followed the national trend that although traffic volumes were impacted by COVID-19, crashes were generally more severe.

Based on the crash information reviewed for this study, there were no reported crashes that could be attributed to the at-grade rail crossings proposed for removal. However, while there was not a recent historical crash pattern, it does not mean that one could present itself in future years, especially as development activity continues and traffic volumes increase.

Additional crash summary graphics are provided in **Appendix A**.

2.3. Corridor Characteristics

A field review was conducted for the Route MM corridor and study intersections. The field review focused on safety concerns, traffic control, geometric deficiencies, and other pertinent information to the study.

The Route MM corridor is currently classified as ‘minor arterial’ by MoDOT, referencing the *Functional Classification Map* for the Springfield urban area. The Route MM corridor for the purposes of this report was reviewed in three sections.

- Segment 1: James River Freeway to Farm Road 160
- Segment 2: Farm Road 160 to US 60
- Segment 3: US 60 to Farm Road 103 (Route MM transitions to Route M in this segment)

Segment 1: Route MM was recently upgraded to a three-lane roadway for this entire north-south segment. The posted speed limit is currently 55 mph with plans to be lowered to 45 mph. The north side of this segment has a diamond interchange with James River Freeway. Terrain is highest at the interchange overpass and is mostly level to the south, with horizontal curves between JRF and Farm Road 156.

Existing access is provided on both sides of the corridor, which serves a new Amazon warehouse facility west of Route MM, but otherwise low traffic generators. Two public roadway

intersections, Farm Road 156 which serves commercial development and Haile Street which serves residences in in the former Village of Brookline, MO. Traffic signals were recently added at the northern interchange ramp, Farm Road 156, and Haile Street.

The existing bridge consists of skewed 285.2-foot, 2-span continuous composite plate girder bridge with non-integral, semi-deep abutments. The most recent bridge inspection report from August 18, 2020 indicates the overall bridge is in good working condition. The bridge deck rating is shown as satisfactory (6), but an MMA overlay is requested in 2024. If an overlay is completed, new glands at the expansion joints should be considered at that time. No additional deficiencies or recommendations are being made from Olsson's site visit.

With the recent widening between Farm Road 156 and Farm Road 160, a 2-foot shoulder was added along the east side of Route MM. Though the addition of this offset provides a greater clear zone, the large transmission power poles still slightly encroach into the roadway clear zone based on the roadway speed and AADT.

Segment 2: South of Farm Road 160, Route MM is a two-lane undivided roadway that curves southwest and crosses the railroad tracks at-grade at a sharp, near 90-degree turn in close proximity to the signalized intersection with US 60. The posted speed limit is 55 mph with lowered advisory speed limits, 45 mph and 15 mph, at the two horizontal curves. Multiple access points are provided in the vicinity of the Magellan Pipeline with sparse driveway density further south. Terrain of the roadway is mostly level with a sag curve just north of the rail crossing.

Based on the roadway speed and AADT, the following obstructions appear to be located within the desired clear zone:

- Power poles within the northern section of this corridor.
- A crossroad RCB located approximately 190 feet south of Farm Road 160.
- Mature tree growth north of the railroad crossing on the west side of Route MM.

Segment 3: South of US 60, Route MM transitions to Route M and becomes an east-west, two-lane roadway. The posted speed limit is 55 mph with lowered advisory speed limits near the horizontal curve and roundabout with Farm Road 103. Roadway access is primarily limited to public roadway intersections. The roadway is mostly level near US 60 and transitions to rolling terrain in the vicinity of Route ZZ and Farm Road 103.

Notable deficiencies in this segment include:

- The existing Farm Road 101 and Farm 170 intersection Route M at a very sharp angle on a horizontal curve. The intersection angles create difficult head turning movements.
- The Farm Road 101 intersection sight distance is blocked by vegetation along the right-of-way line looking eastward.

3. TRAVEL DEMAND MODEL UPDATE

The OTO regional travel demand model (TDM) was updated for the study area in order to determine future traffic demands along the corridor.

3.1. Future Year Land Uses and Projects

Future Land Uses:

Projected development activity was provided by the City of Republic and included potential areas for residential, commercial, and industrial activity. Projected development utilized in analysis is depicted in **Figure 7**. For TDM input, these areas were assumed to be in place by the year 2045 and were assumed to develop at the following floor-area-ratios (FAR): 0.40 for industrial, 0.3 for office, and 0.22 for retail. Four dwelling units/acre for single family housing and 24 dwelling units/acre for multifamily residential housing were also assumed for projected residential areas.

Conceptual, Planned, and Committed Projects:

Nearby planned roadway improvements influencing traffic patterns were also assumed to be in place for the future year conditions. This primarily includes widening US 60 to a six-lane section (conceptual stage) within the study area and widening Route MM to a 5-lane section between I-44 and James River Freeway north of the study area. This information was derived from Olsson's previous involvement with the J8S3159 MoDOT 413/60 Corridor Study (Phase 1) and a cost share agreement between MoDOT and the City of Republic. The following at-grade railroad crossings were also assumed to be closed: FR 93 north of US 60, FR 170 north of US 60, Route MM north of US 60, Haile/Orr Street north of US 60, and FR 103 south of US 60; FR 101 north of US 60 is expected to remain open until alternate access can be provided. Further information regarding the railroad crossings can be found in the MoDOT safety study of the BNSF Cherokee Subdivision line from M.P. 251 to M.P. 258 in Greene, Christian, and Lawrence Counties completed in 2018.

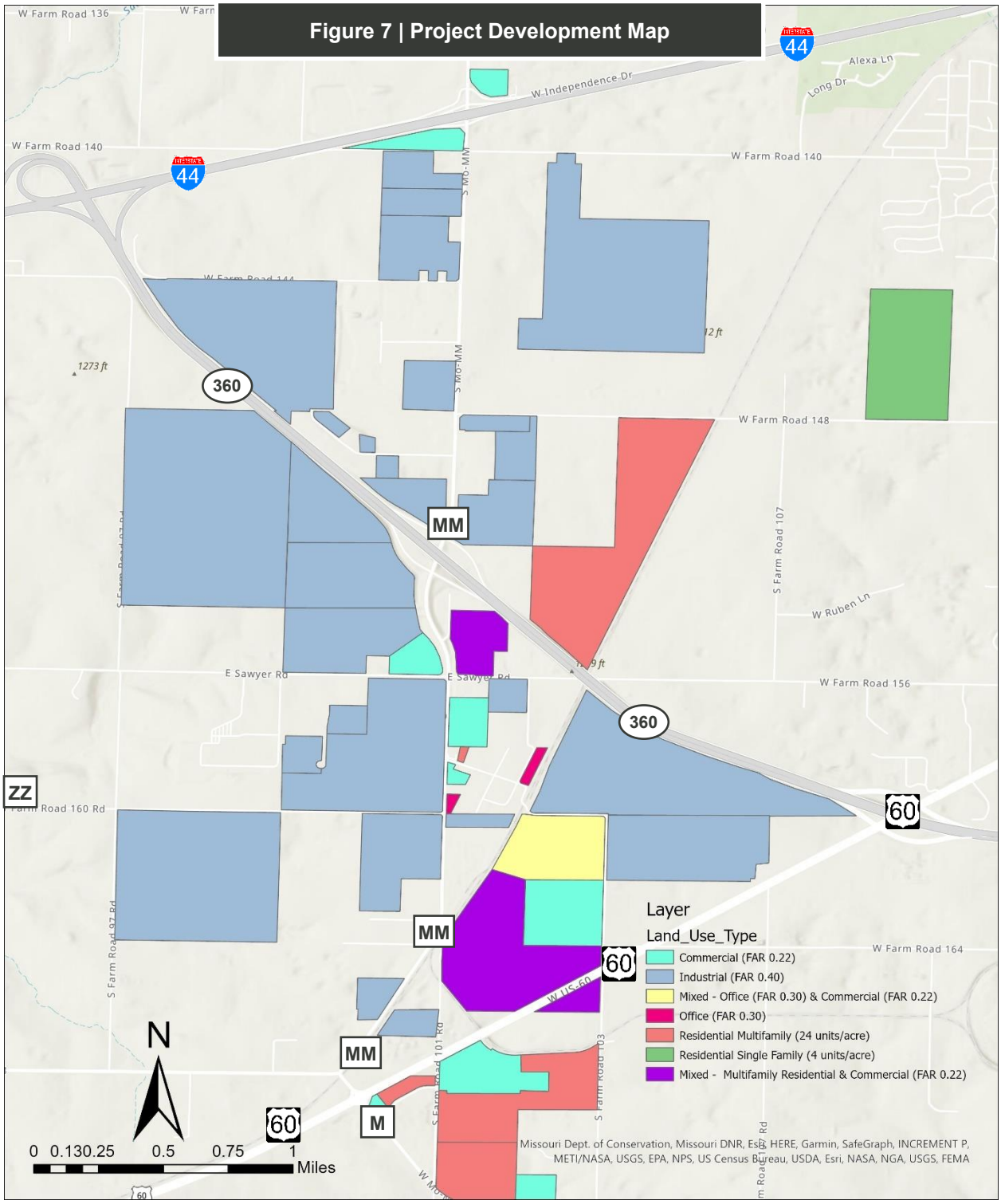


Figure 7. Project Development Map

3.2. Roadway Template Alternatives

The TDM was updated for multiple roadway configurations that were initially considered for this project. These include:

- Five-lane Section of Realigned Route MM
- Three-lane Section Extension of Route ZZ to US 60
- Partial Build Alignment (includes realignment of Route MM from Farm Road 160 with railroad overpass to US 60 and connects with the existing Farm Road 103 alignment)
- Full Build Alignment (includes Partial Build plus extension of Route ZZ to US 60)

Figures 8 and 9 below illustrates the conceptual Partial and Full Build Alignments considered for this study.

Figure 8. Partial Build Alignment

Figure 9. Full Build Alignment

4. ROADWAY ALTERNATIVES INITIAL FINDINGS

During the initial evaluation process, two important discoveries were made when comparing the five-lane vs three-lane and partial build vs full build alignments.

4.1. No Build Option

In addition to evaluating the proposed alternatives, a 'No-Build' base condition was considered. The No-Build condition included consideration of committed roadway improvements such as the widening of US 60 and the widening of Route MM north of JRF. This scenario analysis is intended to check the travel pattern and performance of existing road links while considering potential future developments expected to take place through 2045.

According to the TDM, multiple road segments in the study area are expected to operate with a volume-to-capacity (v/c) ratio close to or above 1.0. A summary of the expected v/c ratios at a few select roadway segments are shown in **Table 2**.

Table 2. Existing Route MM/M Alignment v/c ratio for Future No Build

Location	V/C Ratio
Rt MM between JRF and FR 156	1.22
Rt MM between FR 156 and FR 160	0.98
Rt MM between FR 160 and US 60	0.81
Rt M between US 60 and Rt ZZ	0.59

It should be noted that the segment capacities considered by the TDM are not directly related to the five-lane and three-lane segment capacities described in Section 232.3 of the MoDOT EPG or the directional capacities considered by the OTO. In general, the TDM assigns a higher roadway capacity than typically considered in the EPG. This may result in an artificially high level of attraction to these roadways. Moreover, the model is unable to account for specific interactions such as the negative effect at-grade rail crossings have on capacity. Thus, the projected traffic volumes derived from the TDM are expected to be a conservatively high estimate.

4.2. Future Full Build vs Partial Build Comparison

Under the partial build configuration, the realigned Route MM would form a signalized intersection with Farm Road 103. Vehicles traveling from Route ZZ must either utilize Farm Road 103 or US 60, both of which would include multiple 90-degree turns through controlled intersections.

Based on the TDM projections, Farm Road 103 would quickly reach capacity under the partial build configuration. Assuming a capacity of approximately 5,000 vpd and a linear annual growth rate, Farm Road 103 would be over capacity by the year 2025.

In addition to the needed capacity, the full build configuration would provide the following benefits:

- Improved connectivity from Route ZZ to Route MM
- Reduced traveling distance from Route ZZ to Route MM
- Eliminate delay and travel time encountered at additional, intermediate intersections (the signal at US 60 & Route M and/or the roundabout at Farm Road 103 & Route M)
- Minimize potential conflicts from existing residential driveways

4.3. Five-Lane vs Three-Lane Comparison

Based on the TDM forecasts, Route MM would be expected to have significantly different attraction depending on the ultimate cross section. **Table 3** shows the projected ADTs of the realigned Route MM at different locations along the corridor for the future year 2045.

Table 3. Route MM/ZZ 2045 5-lane and 3-lane Average Daily Traffic Volumes.

Location	5-lane Configuration	V/C Ratio	3-lane Configuration	V/C Ratio
Rt MM between JRF and FR 156	27,100-33,000	1.23	18,790-20,060	1.75
Rt MM between FR 156 and FR 160	24,260-25,160	0.88	16,880-18,480	1.44
Rt MM between FR 160 and US 60	22,970-31,480	1.10	11,900-19,090	1.53
Rt ZZ between US 60 and Rt M	13,800	0.46	10,750	0.72

Note: Volume-to-capacity ratios are based on the segment volumes projected by the TDM divided by the roadway capacities considered by the OTO for each facility type.

As shown in the table above, in comparing the expected future volumes to the expected roadway capacities based on discussions with OTO staff, the three-lane section would be well over capacity for the roadway section north of US 60. Section 232.3 of the MoDOT Engineering Policy Guide (EPG) outlines when three and five lane facilities are typically considered. Three-lane facilities may be used where AADT in the design year is less than 17,500 vpd, whereas five-lane facilities may be used up to 28,000 vpd and a raised median considered where volumes exceed 28,000 vpd. The highest ADTs are expected at the development access points nearest to James River Freeway and US 60 indicating that these roadways are significant attractions for nearby development trips. Depending on how these areas develop, raised medians should also be considered should these volumes materialize to provide additional capacity and controlled access points.

The ADT comparison indicates that there is latent demand if Route MM is constructed as a three-lane roadway, particularly for the section north of US 60. Roadway users prefer to utilize Route MM, given that it is a vital north-south connection, but a three-lane roadway would ultimately become constrained in multiple locations. The Route ZZ segment south of US 60 is not expected to exceed the typical three-lane segment capacity. **Table 4** below details the expected future volumes and v/c ratios of the corridor presented in the TDM if a 5-lane section is constructed north of US 60 and a 3-lane section is constructed south of US 60.

Table 4. Anticipated Route MM/ZZ 2045 Average Daily Traffic Volumes.

Location	5-lane North of US 60, 3-lane South of US 60	V/C Ratio
Rt MM between JRF and FR 156	27,500-33,100	1.20
Rt MM between FR 156 and FR 160	24,110-25,750	0.89
Rt MM between FR 160 and US 60	22,720-30,620	1.08
Rt ZZ between US 60 and Rt M	12,250	0.82

The ultimate 2045 five-lane full build traffic volumes and the typical roadway capacities described in Section 232.3 of the EPG were used to determine the approximate timeline when the expected volumes would exceed a three-lane capacity, and thus when a five-lane facility should be considered. This is illustrated in **Table 5** below assuming a linear growth pattern.

Table 5. Anticipated Timeline of Roadway Improvements.

Location	Expected Timeline for 5-lane Configuration
Rt MM between JRF and FR 156	2027
Rt MM between FR 156 and FR 160	2032
Rt MM between FR 160 and US 60	2030
Rt ZZ between US 60 and Rt M	2065

The time horizon presented in **Table 5** is based on a linear growth pattern interpolated between existing daily traffic volumes to the future year 2045 projected volumes. The estimated year represents the time when the projected traffic volumes exceed a three-lane segment capacity of 17,500 vehicles per hour, per MoDOT EPG. Considering that the earliest time of construction for the recommended improvements is expected to be approximately 2025, the three-lane capacity threshold for all Route MM roadway segments north of US 60 would be within 7 years of anticipated construction. Thus, it is not recommended to construct a three-lane cross-section for Route MM north of US 60. A five-lane cross-section is recommended between James River Freeway and US 60. In addition, raised medians should also be considered in locations where development activity is heaviest (possibly immediately south of James River Freeway and immediately north of US 60) to allow for controlled access points and increased capacity along Route MM.

Based on the projected traffic volumes, the roadway section of Route ZZ between US 60 and Route M is not expected to reach the typical three-lane facility segment capacity for the design year 2045. However, additional capacity may be needed at controlled intersections. See **Section 5** for further discussion on intersection capacities.

It should be noted that these projection years are highly dependent on the rate of development activity and programmed improvements of adjacent roadways. For example, if development grows at a quicker rate, this projected timeline may shorter. Likewise, if Route ZZ or Route M are improved, travel patterns could shift resulting in more vehicles utilizing the southern section of Route ZZ between US 60 and Route M.

5. ANALYSIS OF PREFERRED CONCEPTUAL CONFIGURATION

The preferred concept for the realigned Route MM is expected to include a five-lane cross-section north of US 60 and a three-lane cross-section south of US 60 within the study area. The ultimate traffic condition was reviewed for the 2045 full build out condition with the assumed development areas in place as described in **Section 3.1**.

The following intersection configurations in the vicinity of the study area were considered for analysis:

- Route MM & James River Freeway Westbound Ramps – Traffic signal (existing)
- Route MM & James River Freeway Eastbound Ramps – Traffic signal (recommended due to projected left-turn traffic)
- Route MM & Farm Road 156 – Traffic signal (existing)
- Route MM & Haile Street – Traffic signal (existing)
- Route MM & Farm Road 160 – Roundabout or traffic signal (conceptual)
- "Old" Route MM & US 60 – Traffic signal (existing)
- "New" Route MM & US 60 – Traffic signal (conceptual)
- Route ZZ & Route M – Roundabout or traffic signal (conceptual)
- Route M & Farm Road 103 – Roundabout (existing)

Safety analysis was performed using HSM methodologies for key intersection locations including the intersection of Route MM with Farm Road 160 and US 60 and the intersection of Route ZZ with Route M.

5.1. Safety Analysis

Future crashes for the 2045 design year were predicted using the Federal Highway Association's (FHWA) Interactive Highway Safety Design Model (IHSDM). This tool applies HSM methodologies to predict crashes for a variety of facility types. For this project, future crashes were reviewed at the critical connection points of the re-aligned Route MM corridor: the conceptual roundabout at Route MM & Farm Road 160, traffic signal at Route MM & US 60, and roundabout at Route ZZ & Route M.

The IHSDM utilizes crash prediction modules developed from National Cooperative Highway Research Program (NCHRP) 17-58 for Six-Lane Urban/Suburban Arterials and NCHRP 17-70 for Roundabouts. These methodologies have recently been developed and thus were not incorporated into the HSM 1st Edition but are likely intended for inclusion in the future HSM 2nd Edition.

A summary of the future year 2045 crashes at these critical connection points are illustrated in **Table 6**. HSM calibration factors have not been developed for these facility types at the time of

this report. Thus, the standard crash outputs provided by the model are provided below. The multiple roundabout configurations considered for this project are included for comparison.

Table 6. Future Year 2045 Crash Prediction.

Intersection	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Total Crash Frequency (crashes/yr)	Predicted Intersection Crash Rate (crashes/ million veh)
Route MM & Farm Road 160 Roundabout (*with Free WBR*)	1.2	8.5	9.7	2.0
Route MM & Farm Road 160 Roundabout (*with Yielding WBR*)	1.8	8.5	10.3	2.2
Route MM & US 60 Signal	12.5	11.0	23.5	0.9
Route ZZ & Route M Roundabout (*Hybrid without WBR Slip*)	1.5	8.5	9.9	2.1
Route ZZ & Route M Roundabout (*Hybrid with WBR Slip*)	0.9	8.0	8.9	1.9

Based on the crash prediction results, fewer crashes would be expected at the Route MM & Farm Road 160 roundabout configuration with a free westbound slip right-turn lane as opposed to dual yielding right-turn lanes. Similarly, the addition of a yielding westbound slip right-turn lane at the Route ZZ & Route M roundabout is expected to result in fewer crashes as well.

IHSDM input and output data for this crash prediction are provided in **Appendix C**.

5.2. Signalized Intersection Capacity Analysis

Signalized intersection capacity was performed using Synchro Version 11 applying HCM Methodologies. A summary of the future operations expected at each signalized intersection is provided below.

<u>Route MM & James River Freeway Westbound Ramps – Traffic signal (existing)</u>

- LOS B and LOS C overall in AM and PM respectively.
    - Considers widening of Route MM striped as a five-lane section (see JRF Eastbound Ramps for more details regarding bridge widening).

  - Considers widened off-ramp to provide dual right-turn and a single left-turn movement.
  - Assumed signal coordination along Route MM between James River Freeway and Haile Street.

Route MM & James River Freeway Eastbound Ramps – Traffic signal (recommended)

- LOS A and LOS B overall in AM and PM respectively.
  - Considers six-lane bridge to accommodate two through lanes in each direction and dual southbound left-turn lanes, which are expected to be warranted considering the anticipated development activity.
  - Two receiving lanes would be required on the on-ramp before merging to one.
  - Assumed signal coordination along Route MM between James River Freeway and Haile Street.
  - A heavy northbound right-turn movement is expected and should be monitored, particularly if a traffic signal with dual left-turn lanes is installed.

Route MM & Farm Road 156 – Traffic signal (existing)

- LOS C overall during AM and PM peak hours.
  - Considers widening of Route MM to a five-lane section.
  - Considers single left and right-turn lanes in all directions.
  - Assumed signal coordination along Route MM between James River Freeway and Haile Street.
  - Depending on how the east leg of Farm Road 156 develops (and its future access points), a heavy westbound right-turn movement could be expected and should be monitored.

Route MM & Haile Street – Traffic signal (existing)

- LOS A and LOS B during AM and PM respectively.
  - Considers widening of Route MM to a five-lane section.
  - Considers single left-turn lanes in all directions as well as a dedicated southbound right-turn lane.
  - Assumed signal coordination along Route MM between James River Freeway and Haile Street.

Route MM & Farm Road 160 – Roundabout or traffic signal (conceptual)

A coordinated traffic signal with dual southbound left, dual westbound right-turn lanes, and single left-turn lanes in the remaining directions is expected to operate at a LOS B during peak periods. Variations of a roundabout were also considered at the intersection of Route MM &

Farm Road 160, which are expected to result in less delay and queueing. It should be noted that while considered to be acceptable, the signalized operations are expected to be slightly less desirable while also requiring more approach lanes compared to the roundabout. Roundabout operations are described in the next section.

"Old" Route MM & US 60 – Traffic signal (existing)

- LOS B and LOS C during AM and PM respectively.
    - Considers widening of US 60 to six-lane section.
    - Assumed east-west signal coordination along US 60.
    - North leg only serves local developments since the at-grade rail crossing would be removed.
    - Considers dual northbound left-turn lanes and single-left turn lanes at all other approaches considering the expected turning movements.
    - Considers single north/south through lanes and single right-turn lanes at all approaches.

"New" Route MM & US 60 – Traffic signal (conceptual)

- LOS E during AM and PM peak hours.
    - Considers widening of US 60 to six-lane section.
    - Considers re-aligned Route MM constructed with two north/south through lanes in each direction.
    - Considers dual left-turn lanes the eastbound, westbound, and southbound directions and a single northbound left-turn lane.
    - Considers single right-turn lanes in all directions.
    - Assumed east-west signal coordination along US 60.
    - *Given that this intersection is on the threshold of failure under 2045 full build conditions, special consideration should be given to protect right-of-way in the vicinity of the intersection. This includes but is not limited to considerations for high-capacity alternative intersection geometrics.*
    - *Heavy left-turn movements are expected for the eastbound, westbound, and southbound directions. These traffic patterns are partially driven by the improved north-south corridor but also depend on how the area develops, including the trip split between this intersection and other future development access points (e.g., Farm Road 107 to the east).*

Route ZZ & Route M – Roundabout or traffic signal (conceptual)

Based on the expected segment ADT along Route ZZ between US 60 and Route M, a three-lane section is expected to be adequate. Based on overall intersection delay alone, a traffic

signal with single through and dedicated left and right-turn lanes in all directions would operate at a LOS D during peak periods. However, multiple movements would encounter undesirable amounts of delay which could result in excessive queueing in all four directions.

It is expected that additional lanes would be needed to accommodate this queueing at the signal. Important turn lanes to consider include two through lanes in the northbound and southbound direction as well as dual westbound left-turn lanes. However, this widening at the signal may be difficult to transition back to a three-lane section.

Variations of a roundabout were also considered at the intersection of Route ZZ & Route M, which are described in the next section.

5.3. Roundabout Capacity Analysis

Roundabout intersection capacity was performed using Sidra Version 9.0 applying HCM methodologies. A summary of the future operations expected at each roundabout configuration is provided below.

Route MM & Farm Road 160 – Roundabout or traffic signal (conceptual)

Two roundabout configurations were considered: one with a free westbound slip right-turn lane and the second with dual yielding westbound right-turn lanes. Both configurations are expected to be acceptable. The free right-turn option is expected to have the least amount of delay and is the preferred option. However, as the area develops, consideration should be given to the potential weave scenario that may be introduced with northbound Route MM traffic merging into a single right-turn lane at the roundabout.

- A free westbound slip right-turn results in a LOS A overall in AM and PM peak hours.
    - Considers yielding westbound through/left and free westbound right-turn.
    - Considers two circulating lanes for dual southbound left-turn movements.
    - All approaches are expected to operate at a LOS C or better with acceptable queueing.
- Yielding dual westbound right-turns result in LOS B overall in AM and PM peak hours.
    - Considers westbound through/left/right and dedicated right-turn with both lanes yielding before entering the circulatory roadway.
    - Considers two circulating lanes for dual southbound left-turn movements.
    - The 95th-percentile queue for the westbound approach is expected to be approximately 258 feet during the AM peak hour.

Route ZZ & Route M – Roundabout or traffic signal (conceptual)

Two roundabout configurations were considered: one without a westbound slip right-turn and one with a westbound slip right-turn lane.

- Without a westbound slip right-turn, the roundabout operates at a LOS B and LOS C during AM and PM respectively.
    - Considers two circulating lanes for dual southbound through movements and two southbound receiving lanes on Route ZZ. The analysis results indicate that the second receiving lane should be a minimum of 400 feet.
    - Considers free northbound right-turn lane.
    - Considers four-lane section on the east leg for a dedicated westbound left-turn, shared westbound through/right, eastbound receiving lane from the circulatory roadway and eastbound receiving lane for the free northbound right-turn lane.
    - All approaches are expected to operate at a LOS C or better except for the shared westbound through/right. The westbound through/right is expected to operate at a LOS D with a 95th-percentile queue of 632 feet in the PM peak hour.
- With a westbound slip right-turn, the roundabout operates at a LOS B during both AM and PM peak hours.
    - Considers the same lane configuration as described above with the addition of a dedicated westbound slip right-turn to reduce queueing.
    - All approaches are expected to operate at a LOS C or better. The westbound through lane queue is expected to reduce to approximately 171 feet in the PM.

A traffic signal was also considered at the intersections of Route MM with Farm Road 160 and Route ZZ with Route M; signalized operations of both intersections are described in **Section 5.2**. However, the reviewed roundabout configurations are expected to operate acceptably and require fewer approaching lanes. Because the roundabout is the preferred intersection type at this location, capacity analysis results in the figures below are for the roundabout configurations. Traffic signal operations are provided in the Appendix for comparison.

<u>Route M & Farm Road 103 – Roundabout (existing)</u>

- LOS A overall in both AM and PM peak hours.
    - Considers two circulating lanes to allow two east-westbound lanes in each direction.
    - Considers one approaching lane in the north-south direction.
    - All approaches are expected to operate at a LOS B or better with acceptable queueing.

Future year 2045 peak hour traffic conditions are illustrated in **Figures 10-12**.

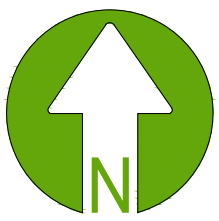
Detailed capacity analysis results are provided in **Appendix B**.

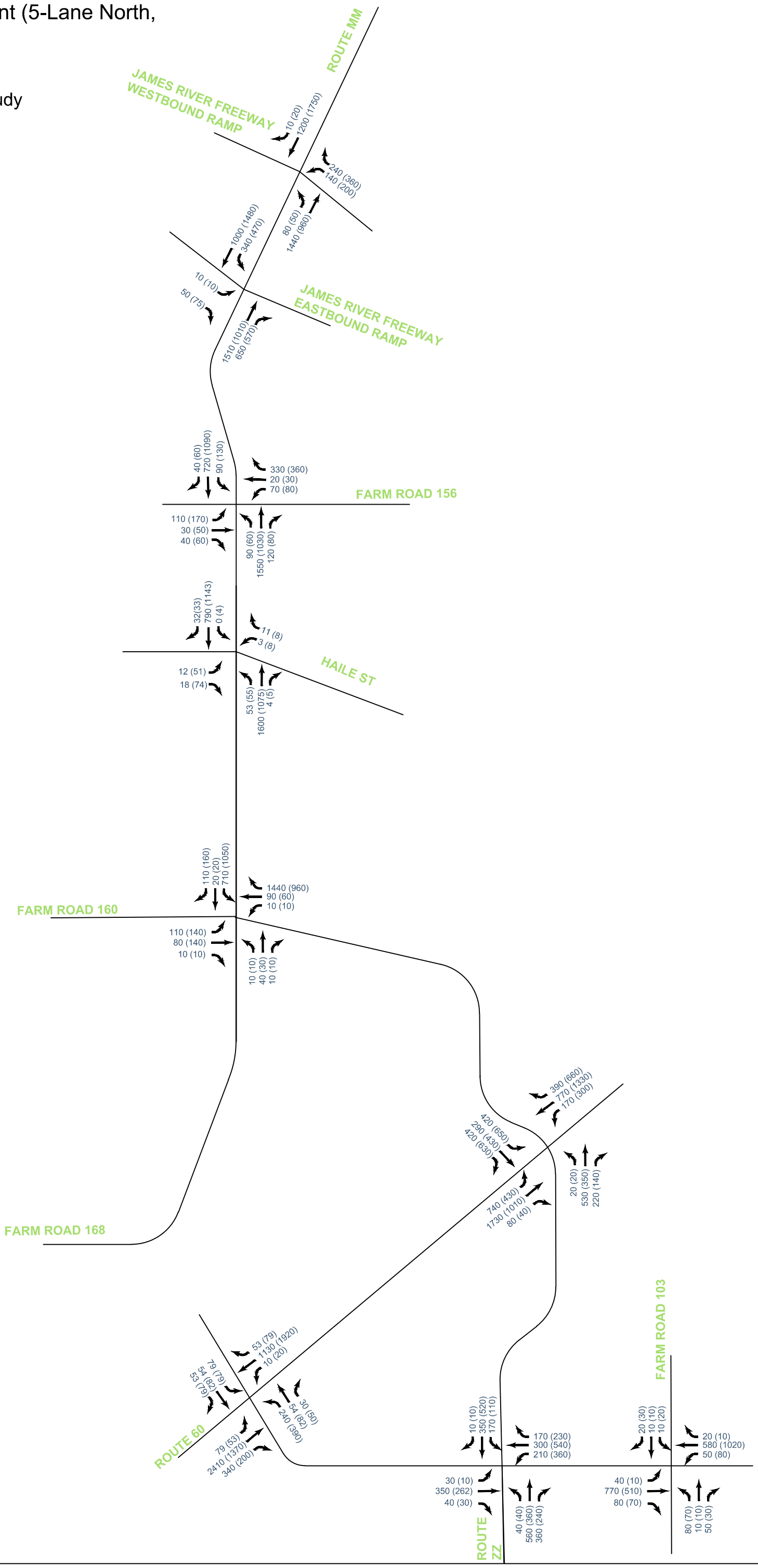
FIGURE 10

2045 Full Build Alignment (5-Lane North, 3-Lane South) Peak Hour Volumes

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County





LEGEND

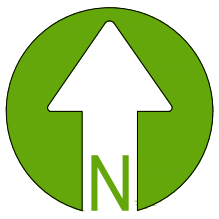
AM (PM) *Peak Hour Volume*

FIGURE 11

2045 Full Build Alignment (5-Lane North, 3-Lane South)
Lane Configuration and Traffic Control

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County



LEGEND

- *XX' → *Lane Configuration & Storage Length*
- *XX' → *Future Lane Configuration & Storage Length*
- Signalized Intersection
- STOP — Stop Controlled Intersection
- Stop Sign
- TWLTL — Two-Way Left-Turn Lane
- ▼ Channelized Right-turn

*Assumed turn lane length utilized for capacity analysis. The ultimate turn lane length should at least accommodate the 95th-percentile queue and if possible provide for proper deceleration distance.

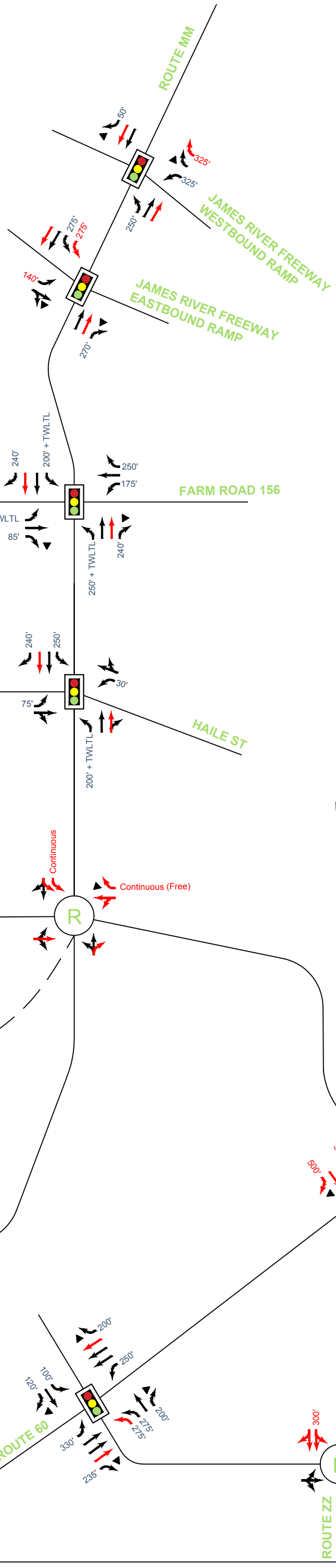
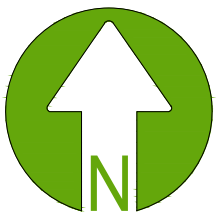


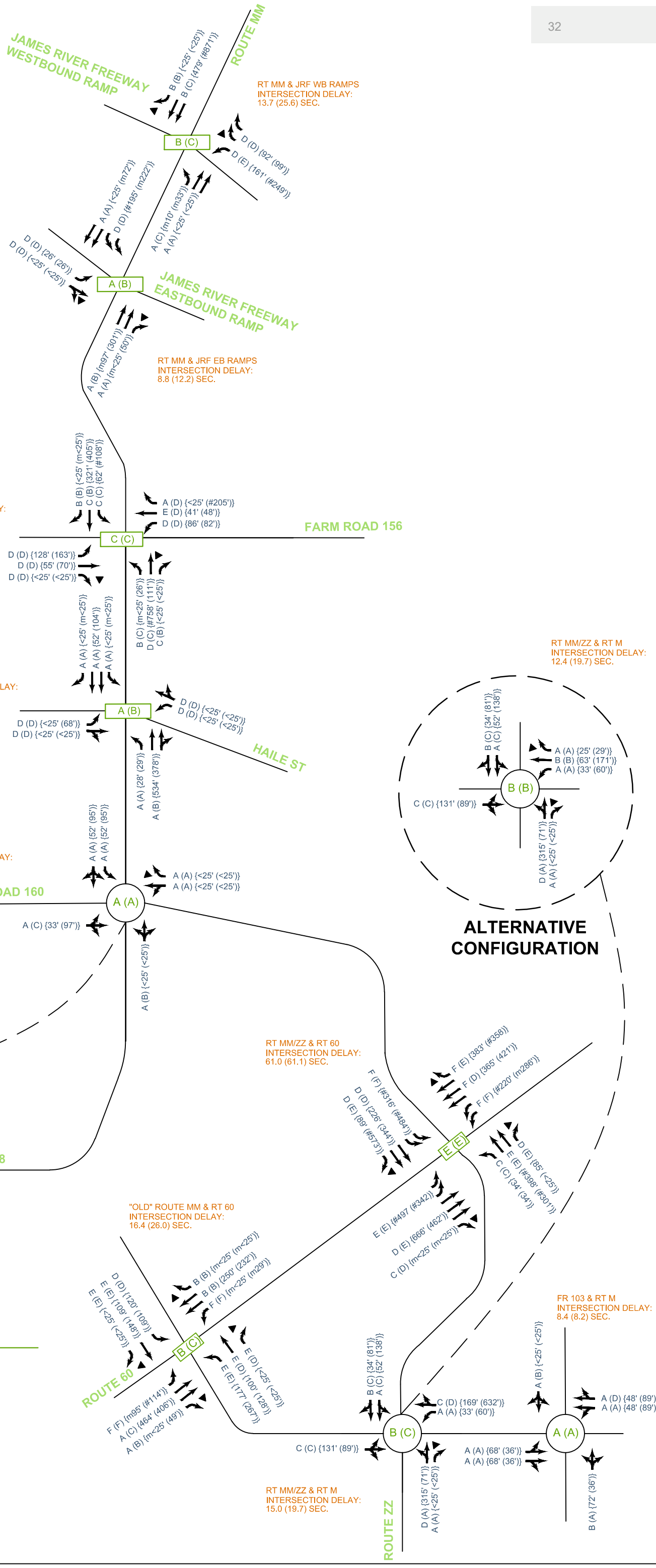
FIGURE 12

2045 Full Build Alignment (5-Lane North, 3-Lane South) Capacity Analysis

J8S0836 Traffic Corridor Study
Route MM from US 360 to
Route M/ZZ

Republic, MO
Greene County





LEGEND

AM (PM) {AM' (PM')}	Movement LOS & {95th–Percentile Queue}
AM (PM)	Signalized Intersection LOS
	Lane Geometry
STOP	Stop Controlled Intersection
	Stop Sign
	Channelized Right–turn
#	95th–Percentile Queue Exceeds Capacity

5.4. Additional Corridor Construction Timeline Considerations

It is understood that construction of the preferred conceptual corridor configuration may not be feasible until funding becomes available. At the time of this report, funding for project J8S0836D (from Farm Road 160 to US 60) is currently funded. Funding for projects J8S0836A (from JRF to Farm Road 160) and J8S0836C (from US 60 to Route M) are in the process of being programmed but are not funded at this time. J8S0836B (from I-44 to JRF) is a planned project is and not directly included in the scope of this report; this widening is assumed to be in place for this study. For reference, the project map is previously shown in **Figure 1**.

Table 7 below discusses potential outcomes for various scenarios when pairing the Route MM realignment projects assuming development activity continues as expected.

Table 7. Route MM Project Pairing Scenarios.

Scenario	Potential Outcome
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with Full Access	• Traffic expected to utilize FR 103 until capacity is reached (within 3 years of initial project completion assuming unimproved FR capacity of 5,000 vpd). • Once FR 103 capacity is reached, additional traffic likely to reroute to Rt M and US 60.
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with RIRO Access	• Traffic expected to reroute to Rt M and US 60. • Rt M between US 60 and Rt ZZ design year 2045 ADT increases to 12,840 vpd, potentially warranting widening to 3-lane if left-turn volumes are heavy. • US 60 between Rt M and “new” Rt MM design year 2045 ADT increases to 45,180 vpd. • According to OTO capacity thresholds, US 60 has a future capacity of 53,250 vpd. While not over capacity, increased congestion would be expected, and a weave scenario from Rt M, to US 60 to New Rt MM would be introduced. • FR 103 between US 60 and Rt M design year 2045 ADT of 3,620 vpd (3,300 vpd northbound).
J8S0836D Constructed, J8S0836A Not Constructed	• Traffic expected to utilize Rt MM until capacity is reached (possibly as early as 2027 north of FR 156 and 2032 south of FR 156). • Rt MM capacity north of FR 160 expected to be 17,500 vpd as a 3-lane roadway.

6. SUMMARY

The purpose and need of this project are to provide traffic analysis, modeling, and forecasting with recommendations for staged project implementation of the conceptual Route MM/ZZ corridor alignment. This report summarizes the analysis associated with the proposed realignment of Route MM and Route ZZ in Republic, Missouri. This realignment would include two rail overpasses and coincide with the closure of multiple at-grade rail crossings in the area. Considering that this corridor is a critical north-south connector for the region and is experiencing significant development activity in its vicinity, it is important to consider how the future demands can be accommodated to preserve the integrity of the corridor for all users.

The existing conditions pertaining to the capacity, safety, and roadway and bridge design considerations of the current alignment are described as well as the expected constraints for the future no-build scenario if no improvements are made. In order to determine the future needs of the corridor, the Ozarks Transportation Organization's (OTO) travel demand model was updated to include the expected development interests within the study area.

Four baseline alternatives were considered for the future cross-section of the realigned Route MM: three-lane vs five-lane section and partial build vs full build alignment. Under the partial build alignment, the realignment of Route MM between Farm Road 160 and US 60 would initially be constructed and tie into Farm Road 103. Full build alignment would continue the realignment south of US 60 and directly tie into Route ZZ. Based on the findings of this study, Farm Road 103 would quickly reach capacity under the Partial Build alignment. Thus, it was determined that the Full Build alignment would be preferred. The corridor is expected Based on the projected traffic volumes, a five-lane cross-section is expected to be needed along Route MM north of US 60 with a three-lane section along Route ZZ between US 60 and Route M.

Under this roadway configuration the expected 2045 design year average daily volumes for the Route MM corridor are expected to range from 22,720 vehicles per day to 33,100 vehicles per day between James River Freeway and US 60. The highest ADTs are expected at the development access points nearest to these two main highways. Depending on how these areas develop, raised medians should also be considered immediately south of James River Freeway and immediately north of US 60 to control access points and increase capacity along Route MM.

If demand continues in the area as expected, this full build realignment could be programmed by the year 2027 given that Route MM three-lane capacities are expected to be reached between 2027-2032 north of US 60. South of US 60, the full build realignment is recommended as a three-lane roadway based on the volume projections. This section of Route ZZ is expected to be approximately 12,250 vpd, which is below the typical three-lane capacity, by the design year 2045.

The main connection points of the realigned Route MM/ZZ corridor are at Farm Road 160, US 60, and Route M. The intersection of Route MM and Farm Road 160 is expected to operate acceptably as a dual lane roundabout or signalized intersection, with the roundabout configuration resulting in the shortest delays and queues overall. Two viable roundabout configurations are presented, one of which includes a free westbound right-turn and is preferrable considering it is associated with expected lower delays and crash frequency. The intersection of Route MM and US 60 is anticipated to be signalized. If volumes materialize as expected, the intersection will be reaching capacity near 2045 and be in need of re-evaluation, potentially considering innovative intersection types to accommodate demand. The intersection of Route ZZ and Route M is expected to operate acceptably as a hybrid roundabout, a portion of which includes two circulating lanes to accommodate the heaviest movements.

It is understood that construction of the preferred conceptual corridor configuration may not be feasible until funding becomes available. The table below discusses potential traffic outcomes to consider when pairing the various Route MM realignment projects.

Scenario	Potential Outcome
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with Full Access	• Traffic expected to utilize FR 103 until capacity is reached (within 3 years of initial project completion assuming unimproved FR capacity of 5,000 vpd). • Once FR 103 capacity is reached, additional traffic likely to reroute to Rt M and US 60.
J8S0836D Constructed, J8S0836C Not Constructed, FR 103 Is Aligned with RIRO Access	• Traffic expected to reroute to Rt M and US 60. • Rt M between US 60 and Rt ZZ design year 2045 ADT increases to 12,840 vpd, potentially warranting widening to 3-lane if left-turn volumes are heavy. • US 60 between Rt M and “new” Rt MM design year 2045 ADT increases to 45,180 vpd. • According to OTO capacity thresholds, US 60 has a future capacity of 53,250 vpd. While not over capacity, increased congestion would be expected, and a weave scenario from Rt M, to US 60 to New Rt MM would be introduced. • FR 103 between US 60 and Rt M design year 2045 ADT of 3,620 vpd (3,300 vpd northbound).
J8S0836D Constructed, J8S0836A Not Constructed	• Traffic expected to utilize Rt MM until capacity is reached (possibly as early as 2027 north of FR 156 and 2032 south of FR 156). • Rt MM capacity north of FR 160 expected to be 17,500 vpd as a 3-lane roadway.

APPENDIX A

DATA COLLECTION

Traffic Counts

Your Company Name Here

This is your address
Your City, State, Zip Code
Your Tagline Here

File Name : 2135_M_CRD103_RepMoDr_257445_09-15-2015
Site Code : 2135
Start Date : 9/15/2015
Page No : 1

Groups Printed- All Vehicles (no classification)

	CRD 103/RepMO Dr Southbound					Route M Westbound					CRD 103/RepMoDr Northbound					Route M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
06:00 AM	2	0	0	0	2	0	16	4	0	20	1	2	1	0	4	3	39	13	0	55	81
06:15 AM	1	2	0	0	3	0	14	8	0	22	5	4	6	0	15	44	57	21	0	122	162
06:30 AM	1	1	0	0	2	0	19	21	0	40	21	8	11	0	40	36	82	26	0	144	226
06:45 AM	3	9	0	0	12	0	20	16	0	36	4	4	4	0	12	29	79	20	0	128	188
Total	7	12	0	0	19	0	69	49	0	118	31	18	22	0	71	112	257	80	0	449	657
07:00 AM	4	3	0	0	7	2	40	33	0	75	39	1	6	0	46	92	96	28	0	216	344
07:15 AM	2	2	1	0	5	1	49	14	0	64	62	6	11	0	79	55	144	36	0	235	383
07:30 AM	6	1	0	0	7	0	35	1	0	36	10	2	1	0	13	4	193	22	0	219	275
07:45 AM	2	0	2	0	4	0	39	1	0	40	7	0	3	0	10	5	112	28	0	145	199
Total	14	6	3	0	23	3	163	49	0	215	118	9	21	0	148	156	545	114	0	815	1201
08:00 AM	5	1	10	0	16	2	37	7	0	46	3	0	2	0	5	17	99	18	0	134	201
08:15 AM	4	1	0	0	5	1	25	3	0	29	2	1	3	0	6	4	63	20	0	87	127
08:30 AM	7	2	1	0	10	1	32	2	0	35	2	2	2	0	6	1	84	12	0	97	148
08:45 AM	2	0	0	0	2	1	29	0	0	30	1	1	0	0	2	3	58	19	0	80	114
Total	18	4	11	0	33	5	123	12	0	140	8	4	7	0	19	25	304	69	0	398	590
09:00 AM	4	1	1	0	6	0	27	3	0	30	1	1	2	0	4	0	30	16	0	46	86
09:15 AM	3	1	1	0	5	3	36	0	0	39	2	2	0	0	4	2	44	9	0	55	103
09:30 AM	6	0	0	0	6	1	33	0	1	35	3	1	1	0	5	0	56	16	0	72	118
09:45 AM	1	0	0	0	1	0	30	2	0	32	0	0	1	0	1	0	35	4	0	39	73
Total	14	2	2	0	18	4	126	5	1	136	6	4	4	0	14	2	165	45	0	212	380
10:00 AM	6	0	0	0	6	1	36	2	0	39	1	0	0	0	1	2	33	5	0	40	86
10:15 AM	3	0	0	0	3	0	39	2	0	41	3	0	1	0	4	0	40	6	0	46	94
10:30 AM	4	0	0	0	4	1	30	1	0	32	1	1	2	0	4	1	44	2	0	47	87
10:45 AM	10	0	0	0	10	0	39	2	0	41	0	0	2	0	2	2	44	5	0	51	104
Total	23	0	0	0	23	2	144	7	0	153	5	1	5	0	11	5	161	18	0	184	371
11:00 AM	5	3	0	0	8	0	35	1	0	36	1	0	0	0	1	4	32	7	0	43	88
11:15 AM	3	0	0	0	3	1	32	3	0	36	5	5	4	0	14	2	35	8	0	45	98
11:30 AM	8	0	0	0	8	0	42	0	0	42	0	0	1	0	1	0	56	3	0	59	110
11:45 AM	4	0	0	0	4	0	42	0	0	42	0	1	1	0	2	2	40	3	0	45	93
Total	20	3	0	0	23	1	151	4	0	156	6	6	6	0	18	8	163	21	0	192	389
12:00 PM	5	0	0	0	5	0	49	1	0	50	1	0	0	0	1	0	42	3	0	45	101
12:15 PM	4	0	2	0	6	0	34	1	0	35	1	0	2	0	3	0	43	6	0	49	93
12:30 PM	3	0	0	0	3	0	38	0	0	38	2	0	1	0	3	5	51	7	0	63	107
12:45 PM	4	1	2	0	7	0	35	0	0	35	1	0	5	0	6	3	43	10	0	56	104
Total	16	1	4	0	21	0	156	2	0	158	5	0	8	0	13	8	179	26	0	213	405

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File Name : 2135_M_CRD103_RepMoDr_257445_09-15-2015
Site Code : 2135
Start Date : 9/15/2015
Page No : 2

Groups Printed- All Vehicles (no classification)

	CRD 103/RepMO Dr Southbound					Route M Westbound					CRD 103/RepMoDr Northbound					Route M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:00 PM	7	0	2	0	9	0	49	0	0	49	2	0	0	0	2	2	42	6	0	50	110
01:15 PM	4	0	0	0	4	0	39	1	0	40	0	1	1	0	2	2	37	10	0	49	95
01:30 PM	4	2	0	0	6	0	43	1	0	44	1	5	13	0	19	3	36	8	0	47	116
01:45 PM	8	0	1	0	9	2	51	3	0	56	0	1	4	0	5	2	33	6	0	41	111
Total	23	2	3	0	28	2	182	5	0	189	3	7	18	0	28	9	148	30	0	187	432
02:00 PM	4	0	0	0	4	1	44	3	0	48	1	0	3	0	4	12	53	8	0	73	129
02:15 PM	4	1	0	0	5	0	47	15	0	62	0	1	1	0	2	11	46	6	0	63	132
02:30 PM	5	0	0	0	5	0	45	9	0	54	34	10	58	0	102	2	54	6	0	62	223
02:45 PM	11	0	0	0	11	0	73	6	0	79	4	2	6	0	12	14	52	6	0	72	174
Total	24	1	0	0	25	1	209	33	0	243	39	13	68	0	120	39	205	26	0	270	658
03:00 PM	7	1	0	0	8	0	68	4	0	72	8	4	9	0	21	7	44	7	0	58	159
03:15 PM	10	0	0	0	10	1	84	5	0	90	6	3	3	0	12	9	44	3	0	56	168
03:30 PM	22	4	2	0	28	0	79	3	0	82	8	1	5	0	14	5	49	4	0	58	182
03:45 PM	27	5	0	0	32	0	77	4	0	81	6	1	5	0	12	9	50	4	0	63	188
Total	66	10	2	0	78	1	308	16	0	325	28	9	22	0	59	30	187	18	0	235	697
04:00 PM	25	1	0	0	26	0	96	7	0	103	7	2	6	0	15	8	57	4	0	69	213
04:15 PM	22	4	1	0	27	1	107	14	0	122	3	1	4	0	8	7	51	9	0	67	224
04:30 PM	19	4	0	0	23	0	101	7	0	108	1	0	0	0	1	13	55	6	0	74	206
04:45 PM	24	3	1	0	28	2	104	5	0	111	4	2	5	0	11	10	58	4	0	72	222
Total	90	12	2	0	104	3	408	33	0	444	15	5	15	0	35	38	221	23	0	282	865
05:00 PM	31	4	1	0	36	1	144	9	0	154	4	0	5	0	9	7	70	8	0	85	284
05:15 PM	33	4	0	0	37	1	155	13	0	169	4	2	4	0	10	20	52	3	0	75	291
05:30 PM	31	4	3	0	38	0	130	14	0	144	12	3	10	0	25	12	60	3	0	75	282
05:45 PM	26	1	1	0	28	1	114	10	0	125	23	7	45	0	75	4	47	11	0	62	290
Total	121	13	5	0	139	3	543	46	0	592	43	12	64	0	119	43	229	25	0	297	1147
06:00 PM	14	3	1	0	18	2	123	3	0	128	12	3	13	0	28	4	56	7	0	67	241
06:15 PM	16	2	1	0	19	0	96	2	0	98	4	1	9	0	14	5	54	8	0	67	198
06:30 PM	14	0	1	0	15	0	60	4	0	64	11	9	9	0	29	9	44	8	0	61	169
06:45 PM	15	0	0	0	15	1	59	2	0	62	7	1	14	0	22	1	34	4	0	39	138
Total	59	5	3	0	67	3	338	11	0	352	34	14	45	0	93	19	188	27	0	234	746
Grand Total	495	71	35	0	601	28	2920	272	1	3221	341	102	305	0	748	494	2952	522	0	3968	8538
Apprch %	82.4	11.8	5.8	0		0.9	90.7	8.4	0		45.6	13.6	40.8	0		12.4	74.4	13.2	0		
Total %	5.8	0.8	0.4	0	7	0.3	34.2	3.2	0	37.7	4	1.2	3.6	0	8.8	5.8	34.6	6.1	0	46.5	

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Default Comments
Change These in The Preferences Window
Select File/Preference in the Main Scree
Then Click the Comments Tab

File Name : 7945_60_M_MM_Aug2018
Site Code : 00007945
Start Date : 8/28/2018
Page No : 1

Groups Printed- Class 1

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:00 AM	2	29	5	0	36	7	40	1	0	48	7	6	9	0	22	9	173	64	0	246	352
06:15 AM	6	38	16	0	60	8	68	4	0	80	19	23	15	0	57	19	212	61	0	292	489
06:30 AM	7	38	22	0	67	7	101	4	0	112	19	16	24	0	59	20	327	52	0	399	637
06:45 AM	11	26	27	0	64	6	105	8	1	120	24	43	17	0	84	37	273	44	0	354	622
Total	26	131	70	0	227	28	314	17	1	360	69	88	65	0	222	85	985	221	0	1291	2100
07:00 AM	17	46	50	0	113	5	126	9	0	140	30	60	33	0	123	54	311	47	0	412	788
07:15 AM	17	64	66	0	147	9	146	7	0	162	29	32	31	0	92	33	457	58	0	548	949
07:30 AM	18	30	31	0	79	10	115	4	0	129	21	11	38	0	70	23	431	44	0	498	776
07:45 AM	9	34	30	0	73	11	131	3	0	145	34	9	31	0	74	22	360	49	0	431	723
Total	61	174	177	0	412	35	518	23	0	576	114	112	133	0	359	132	1559	198	0	1889	3236
08:00 AM	6	19	18	0	43	17	118	2	0	137	31	26	21	0	78	17	251	49	0	317	575
08:15 AM	10	24	18	0	52	15	120	2	0	137	23	18	25	0	66	26	280	43	0	349	604
08:30 AM	6	14	18	0	38	8	111	4	0	123	29	16	26	0	71	24	259	33	0	316	548
08:45 AM	5	9	18	0	32	5	108	1	0	114	23	11	19	0	53	18	222	28	0	268	467
Total	27	66	72	0	165	45	457	9	0	511	106	71	91	0	268	85	1012	153	0	1250	2194
09:00 AM	0	12	19	0	31	14	127	1	0	142	19	4	14	0	37	19	217	26	0	262	472
09:15 AM	2	17	21	0	40	10	117	3	0	130	21	8	8	0	37	11	226	31	0	268	475
09:30 AM	3	12	14	0	29	10	136	2	0	148	19	10	14	0	43	17	189	26	0	232	452
09:45 AM	2	13	12	0	27	19	123	5	0	147	27	8	15	0	50	24	202	26	0	252	476
Total	7	54	66	0	127	53	503	11	0	567	86	30	51	0	167	71	834	109	0	1014	1875
10:00 AM	4	13	22	0	39	5	117	0	0	122	25	8	8	0	41	17	178	18	0	213	415
10:15 AM	1	14	10	0	25	10	134	3	1	148	28	8	4	0	40	17	185	19	0	221	434
10:30 AM	2	14	15	0	31	11	143	1	0	155	25	5	12	0	42	15	155	27	0	197	425
10:45 AM	4	12	12	0	28	6	160	3	0	169	23	10	16	0	49	19	175	17	0	211	457
Total	11	53	59	0	123	32	554	7	1	594	101	31	40	0	172	68	693	81	0	842	1731
11:00 AM	4	7	15	0	26	13	149	3	0	165	32	12	8	0	52	19	169	20	0	208	451
11:15 AM	5	4	8	0	17	12	143	6	0	161	37	9	17	0	63	17	181	27	0	225	466
11:30 AM	7	11	29	0	47	15	157	4	0	176	49	7	7	0	63	20	187	13	0	220	506
11:45 AM	4	14	23	0	41	12	140	2	0	154	30	8	12	0	50	19	159	39	0	217	462
Total	20	36	75	0	131	52	589	15	0	656	148	36	44	0	228	75	696	99	0	870	1885

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File Name : 7945_60_M_MM_Aug2018
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Groups Printed- Class 1

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
12:00 PM	4	12	12	0	28	12	169	4	0	185	34	6	18	0	58	28	158	17	0	203	474
12:15 PM	3	16	20	0	39	14	159	5	0	178	31	3	17	0	51	12	183	42	0	237	505
12:30 PM	2	15	20	0	37	18	166	3	0	187	33	9	12	0	54	24	185	21	0	230	508
12:45 PM	4	14	22	0	40	11	167	4	0	182	33	11	11	0	55	19	162	33	0	214	491
Total	13	57	74	0	144	55	661	16	0	732	131	29	58	0	218	83	688	113	0	884	1978
01:00 PM	3	3	19	0	25	14	183	2	0	199	19	10	13	0	42	21	179	28	1	229	495
01:15 PM	8	10	18	0	36	12	180	6	1	199	27	12	15	0	54	26	170	20	0	216	505
01:30 PM	4	14	29	0	47	10	181	6	0	197	33	12	10	0	55	29	193	22	0	244	543
01:45 PM	4	13	23	0	40	18	169	4	0	191	35	18	19	0	72	27	139	37	0	203	506
Total	19	40	89	0	148	54	713	18	1	786	114	52	57	0	223	103	681	107	1	892	2049
02:00 PM	3	15	15	0	33	8	199	4	0	211	31	12	12	0	55	41	159	23	0	223	522
02:15 PM	6	8	11	0	25	16	193	5	0	214	39	18	13	0	70	20	162	33	0	215	524
02:30 PM	6	34	53	0	93	19	190	3	0	212	43	18	17	0	78	22	160	26	0	208	591
02:45 PM	2	26	48	0	76	13	214	2	0	229	45	13	5	0	63	28	134	20	0	182	550
Total	17	83	127	0	227	56	796	14	0	866	158	61	47	0	266	111	615	102	0	828	2187
03:00 PM	7	24	33	0	64	21	262	2	0	285	37	25	12	0	74	27	164	41	0	232	655
03:15 PM	6	18	29	0	53	22	248	4	0	274	59	16	19	0	94	31	153	25	0	209	630
03:30 PM	5	23	19	0	47	29	317	7	0	353	65	40	18	0	123	28	169	27	0	224	747
03:45 PM	4	28	27	0	59	25	260	10	0	295	71	48	16	0	135	50	183	45	0	278	767
Total	22	93	108	0	223	97	1087	23	0	1207	232	129	65	0	426	136	669	138	0	943	2799
04:00 PM	6	23	25	0	54	15	347	11	0	373	42	35	25	0	102	49	193	24	0	266	795
04:15 PM	4	22	29	0	55	27	306	8	0	341	58	31	18	0	107	40	188	30	0	258	761
04:30 PM	12	15	24	0	51	29	305	13	0	347	54	35	11	0	100	54	202	37	0	293	791
04:45 PM	4	23	31	0	58	25	348	6	0	379	74	42	10	0	126	26	160	27	0	213	776
Total	26	83	109	0	218	96	1306	38	0	1440	228	143	64	0	435	169	743	118	0	1030	3123
05:00 PM	5	26	40	0	71	17	335	9	0	361	66	53	18	0	137	31	178	39	0	248	817
05:15 PM	4	23	26	0	53	24	358	15	0	397	78	38	15	0	131	54	165	38	0	257	838
05:30 PM	9	23	48	0	80	21	377	16	0	414	58	56	7	0	121	49	162	29	0	240	855
05:45 PM	8	24	38	0	70	23	261	9	0	293	54	27	8	0	89	54	181	32	0	267	719
Total	26	96	152	0	274	85	1331	49	0	1465	256	174	48	0	478	188	686	138	0	1012	3229
06:00 PM	8	11	35	0	54	18	213	7	0	238	27	26	5	0	58	26	135	20	0	181	531
06:15 PM	2	26	22	0	50	11	223	11	0	245	40	27	15	0	82	26	122	20	0	168	545

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File Name : 7945_60_M_MM_Aug2018
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Groups Printed- Class 1

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 PM	7	21	47	0	75	11	148	7	0	166	25	20	12	0	57	21	106	14	0	141	439
06:45 PM	5	17	31	0	53	9	144	6	0	159	21	20	6	0	47	24	75	21	0	120	379
Total	22	75	135	0	232	49	728	31	0	808	113	93	38	0	244	97	438	75	0	610	1894
Grand Total	297	1041	1313	0	2651	737	9557	271	3	10568	1856	1049	801	0	3706	1403	10299	1652	1	13355	30280
Apprch %	11.2	39.3	49.5	0		7	90.4	2.6	0		50.1	28.3	21.6	0		10.5	77.1	12.4	0		
Total %	1	3.4	4.3	0	8.8	2.4	31.6	0.9	0	34.9	6.1	3.5	2.6	0	12.2	4.6	34	5.5	0	44.1	

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File Name : 11285_M_ZZ_March2020
Site Code : 11285
Start Date : 3/3/2020
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Groups Printed- All Vehicles (no classification)

	RT ZZ Southbound					RT M Westbound					RT ZZ Northbound					RT M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
10:00 AM	0	0	0	0	0	0	18	11	0	29	41	0	12	0	53	15	25	0	0	40	122
10:15 AM	0	0	0	0	0	0	27	23	0	50	50	0	12	0	62	10	23	0	0	33	145
10:30 AM	0	0	0	0	0	0	29	29	0	58	33	0	16	0	49	12	26	0	0	38	145
10:45 AM	0	0	0	0	0	0	22	29	0	51	41	0	14	0	55	14	13	0	0	27	133
Total	0	0	0	0	0	0	96	92	0	188	165	0	54	0	219	51	87	0	0	138	545
11:00 AM	0	0	0	0	0	0	21	27	0	48	44	0	13	0	57	15	14	0	0	29	134
11:15 AM	0	0	0	0	0	0	17	38	0	55	32	0	10	0	42	27	18	0	0	45	142
11:30 AM	0	0	0	0	0	0	32	38	0	70	35	0	12	0	47	7	23	0	0	30	147
11:45 AM	0	0	0	0	0	0	21	36	0	57	27	0	14	0	41	16	29	0	0	45	143
Total	0	0	0	0	0	0	91	139	0	230	138	0	49	0	187	65	84	0	0	149	566
12:00 PM	0	0	0	0	0	0	21	38	0	59	35	0	17	0	52	17	22	0	0	39	150
12:15 PM	0	0	0	0	0	0	23	37	0	60	39	0	6	0	45	20	17	0	0	37	142
12:30 PM	0	0	0	0	0	0	19	29	0	48	41	0	10	0	51	15	24	0	0	39	138
12:45 PM	0	0	0	0	0	0	30	36	0	66	38	0	12	0	50	12	16	0	0	28	144
Total	0	0	0	0	0	0	93	140	0	233	153	0	45	0	198	64	79	0	0	143	574
01:00 PM	0	0	0	0	0	0	23	42	0	65	23	0	10	0	33	14	21	0	0	35	133
01:15 PM	0	0	0	0	0	0	29	34	0	63	40	0	8	0	48	12	22	0	0	34	145
01:30 PM	0	0	0	0	0	0	21	41	0	62	26	0	13	0	39	12	15	0	0	27	128
01:45 PM	0	0	0	0	0	0	33	53	0	86	41	0	34	0	75	26	17	0	0	43	204
Total	0	0	0	0	0	0	106	170	0	276	130	0	65	0	195	64	75	0	0	139	610
02:00 PM	0	0	0	0	0	0	22	36	0	58	31	0	10	0	41	18	45	0	0	63	162
02:15 PM	0	0	0	0	0	0	26	52	0	78	28	0	15	0	43	23	23	0	0	46	167
02:30 PM	0	0	0	0	0	0	71	95	0	166	43	0	69	0	112	33	16	0	0	49	327
02:45 PM	0	0	0	0	0	0	33	60	0	93	34	0	21	0	55	36	30	0	0	66	214
Total	0	0	0	0	0	0	152	243	0	395	136	0	115	0	251	110	114	0	0	224	870
03:00 PM	0	0	0	0	0	0	37	53	0	90	28	0	16	0	44	23	28	0	0	51	185
03:15 PM	0	0	0	0	0	0	31	95	0	126	35	0	24	0	59	27	16	0	0	43	228
03:30 PM	0	0	0	0	0	0	29	76	0	105	50	0	20	0	70	31	30	0	0	61	236
03:45 PM	0	0	0	0	0	0	46	105	0	151	47	0	34	0	81	43	35	0	0	78	310
Total	0	0	0	0	0	0	143	329	0	472	160	0	94	0	254	124	109	0	0	233	959
04:00 PM	0	0	0	0	0	0	31	107	0	138	37	0	20	0	57	26	31	0	0	57	252
04:15 PM	0	0	0	0	0	0	41	121	0	162	45	0	27	0	72	44	40	0	0	84	318
04:30 PM	0	0	0	0	0	0	43	143	0	186	51	0	26	0	77	46	34	0	0	80	343
04:45 PM	0	0	0	0	0	0	55	163	0	218	51	0	32	1	84	57	40	0	0	97	399
Total	0	0	0	0	0	0	170	534	0	704	184	0	105	1	290	173	145	0	0	318	1312

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File Name : 11285_M_ZZ_March2020
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Groups Printed- All Vehicles (no classification)

	RT ZZ Southbound					RT M Westbound					RT ZZ Northbound					RT M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
05:00 PM	0	0	0	0	0	0	31	166	0	197	56	0	31	0	87	49	39	0	0	88	372
05:15 PM	0	0	0	0	0	0	51	215	0	266	54	0	24	0	78	55	34	0	0	89	433
05:30 PM	0	0	0	0	0	0	47	194	0	241	54	0	13	0	67	60	41	0	0	101	409
05:45 PM	0	0	0	0	0	0	41	154	0	195	44	0	15	0	59	25	24	0	0	49	303
Total	0	0	0	0	0	0	170	729	0	899	208	0	83	0	291	189	138	0	0	327	1517
06:00 PM	0	0	0	0	0	0	42	113	0	155	36	0	20	0	56	30	23	0	0	53	264
06:15 PM	0	0	0	0	0	0	38	95	0	133	42	0	14	0	56	25	29	0	0	54	243
06:30 PM	0	0	0	0	0	0	27	61	0	88	33	0	12	0	45	30	31	0	0	61	194
06:45 PM	0	0	0	0	0	0	35	60	0	95	36	0	17	0	53	24	19	0	0	43	191
Total	0	0	0	0	0	0	142	329	0	471	147	0	63	0	210	109	102	0	0	211	892
07:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Your Company Name Here

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Your City, State, Zip Code
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File Name : 11285_M_ZZ_March2020
Site Code : 11285
Start Date : 3/3/2020
Page No : 3

Groups Printed- All Vehicles (no classification)

	RT ZZ Southbound					RT M Westbound					RT ZZ Northbound					RT M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	5	4	0	9	43	0	16	0	59	2	13	0	0	15	83
06:15 AM	0	0	0	0	0	0	8	12	0	20	62	0	36	0	98	5	14	0	0	19	137
06:30 AM	0	0	0	0	0	0	19	9	0	28	110	0	43	0	153	7	24	0	0	31	212
06:45 AM	0	0	0	0	0	0	22	23	0	45	88	0	32	0	120	29	51	0	0	80	245
Total	0	0	0	0	0	0	54	48	0	102	303	0	127	0	430	43	102	0	0	145	677
07:00 AM	0	0	0	0	0	0	40	33	0	73	142	0	60	0	202	48	110	0	0	158	433
07:15 AM	0	0	0	0	0	0	51	40	0	91	162	0	68	0	230	44	109	0	0	153	474
07:30 AM	0	0	0	0	0	0	31	31	0	62	171	0	62	0	233	15	41	0	0	56	351
07:45 AM	0	0	0	0	0	0	39	25	0	64	139	0	33	0	172	19	25	0	0	44	280
Total	0	0	0	0	0	0	161	129	0	290	614	0	223	0	837	126	285	0	0	411	1538

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File Name : 11285_M_ZZ_March2020
Site Code : 11285
Start Date : 3/3/2020
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Groups Printed- All Vehicles (no classification)

	RT ZZ Southbound					RT M Westbound					RT ZZ Northbound					RT M Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
08:00 AM	0	0	0	0	0	0	23	27	0	50	107	0	22	0	129	33	31	0	0	64	243
08:15 AM	0	0	0	0	0	0	20	24	0	44	96	0	22	0	118	12	27	0	0	39	201
08:30 AM	0	0	0	0	0	0	26	13	0	39	76	0	19	0	95	16	32	0	0	48	182
08:45 AM	0	0	0	0	0	0	23	28	0	51	53	0	15	0	68	15	14	0	0	29	148
Total	0	0	0	0	0	0	92	92	0	184	332	0	78	0	410	76	104	0	0	180	774
09:00 AM	0	0	0	0	0	0	16	13	0	29	45	0	10	0	55	13	19	0	0	32	116
09:15 AM	0	0	0	0	0	0	20	26	0	46	57	0	18	0	75	10	18	0	0	28	149
09:30 AM	0	0	0	0	0	0	25	29	0	54	51	0	22	0	73	12	23	0	0	35	162
09:45 AM	0	0	0	0	0	0	7	27	0	34	39	0	10	0	49	15	21	0	0	36	119
Total	0	0	0	0	0	0	68	95	0	163	192	0	60	0	252	50	81	0	0	131	546
10:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1539	3069	0	4608	2862	0	1161	1	4024	1244	1505	0	0	2749	11381
Apprch %	0	0	0	0		0	33.4	66.6	0		71.1	0	28.9	0		45.3	54.7	0	0		
Total %	0	0	0	0	0	0	13.5	27	0	40.5	25.1	0	10.2	0	35.4	10.9	13.2	0	0	24.2	

MM / US-360 EB Ramps On - ATR

Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound		
Time	T	**App**	**Int**
2021-07-29 12:00AM	20	**20**	**20**
12:15AM	9	**9**	**9**
12:30AM	5	**5**	**5**
12:45AM	2	**2**	**2**
Hourly Total	36	**36**	**36**
1:00AM	1	**1**	**1**
1:15AM	1	**1**	**1**
1:30AM	3	**3**	**3**
1:45AM	2	**2**	**2**
Hourly Total	7	**7**	**7**
2:00AM	0	**0**	**0**
2:15AM	3	**3**	**3**
2:30AM	3	**3**	**3**
2:45AM	4	**4**	**4**
Hourly Total	10	**10**	**10**
3:00AM	3	**3**	**3**
3:15AM	7	**7**	**7**
3:30AM	5	**5**	**5**
3:45AM	5	**5**	**5**
Hourly Total	20	**20**	**20**
4:00AM	7	**7**	**7**
4:15AM	5	**5**	**5**
4:30AM	8	**8**	**8**
4:45AM	7	**7**	**7**
Hourly Total	27	**27**	**27**
5:00AM	16	**16**	**16**
5:15AM	17	**17**	**17**
5:30AM	19	**19**	**19**
5:45AM	31	**31**	**31**
Hourly Total	83	**83**	**83**
6:00AM	26	**26**	**26**
6:15AM	47	**47**	**47**
6:30AM	60	**60**	**60**
6:45AM	58	**58**	**58**
Hourly Total	191	**191**	**191**
7:00AM	57	**57**	**57**
7:15AM	82	**82**	**82**
7:30AM	93	**93**	**93**
7:45AM	92	**92**	**92**
Hourly Total	324	**324**	**324**
8:00AM	69	**69**	**69**
8:15AM	72	**72**	**72**
8:30AM	63	**63**	**63**
8:45AM	54	**54**	**54**
Hourly Total	258	**258**	**258**
9:00AM	54	**54**	**54**
9:15AM	54	**54**	**54**
9:30AM	40	**40**	**40**
9:45AM	62	**62**	**62**
Hourly Total	210	**210**	**210**
10:00AM	46	**46**	**46**
10:15AM	54	**54**	**54**
10:30AM	51	**51**	**51**
10:45AM	55	**55**	**55**

Leg Direction	West Eastbound		
Time	T	App	Int
Hourly Total	206	**206**	**206**
11:00AM	75	**75**	**75**
11:15AM	82	**82**	**82**
11:30AM	79	**79**	**79**
11:45AM	55	**55**	**55**
Hourly Total	291	**291**	**291**
12:00PM	93	**93**	**93**
12:15PM	71	**71**	**71**
12:30PM	57	**57**	**57**
12:45PM	40	**40**	**40**
Hourly Total	261	**261**	**261**
1:00PM	52	**52**	**52**
1:15PM	60	**60**	**60**
1:30PM	71	**71**	**71**
1:45PM	41	**41**	**41**
Hourly Total	224	**224**	**224**
2:00PM	53	**53**	**53**
2:15PM	53	**53**	**53**
2:30PM	89	**89**	**89**
2:45PM	63	**63**	**63**
Hourly Total	258	**258**	**258**
3:00PM	56	**56**	**56**
3:15PM	71	**71**	**71**
3:30PM	90	**90**	**90**
3:45PM	82	**82**	**82**
Hourly Total	299	**299**	**299**
4:00PM	83	**83**	**83**
4:15PM	68	**68**	**68**
4:30PM	97	**97**	**97**
4:45PM	99	**99**	**99**
Hourly Total	347	**347**	**347**
5:00PM	141	**141**	**141**
5:15PM	94	**94**	**94**
5:30PM	67	**67**	**67**
5:45PM	78	**78**	**78**
Hourly Total	380	**380**	**380**
6:00PM	64	**64**	**64**
6:15PM	40	**40**	**40**
6:30PM	34	**34**	**34**
6:45PM	43	**43**	**43**
Hourly Total	181	**181**	**181**
7:00PM	43	**43**	**43**
7:15PM	39	**39**	**39**
7:30PM	33	**33**	**33**
7:45PM	21	**21**	**21**
Hourly Total	136	**136**	**136**
8:00PM	33	**33**	**33**
8:15PM	34	**34**	**34**
8:30PM	16	**16**	**16**
8:45PM	25	**25**	**25**
Hourly Total	108	**108**	**108**
9:00PM	27	**27**	**27**
9:15PM	25	**25**	**25**
9:30PM	11	**11**	**11**
9:45PM	12	**12**	**12**
Hourly Total	75	**75**	**75**
10:00PM	21	**21**	**21**
10:15PM	21	**21**	**21**
10:30PM	24	**24**	**24**
10:45PM	23	**23**	**23**

Leg Direction	West Eastbound		
Time	T	**App**	**Int**
Hourly Total	89	**89**	**89**
11:00PM	14	**14**	**14**
11:15PM	7	**7**	**7**
11:30PM	10	**10**	**10**
11:45PM	6	**6**	**6**
Hourly Total	37	**37**	**37**
Total	4058	**4058**	**4058**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
Lights	3688	**3688**	3688
% Lights	90.9%	**90.9%**	90.9%
Articulated Trucks	172	**172**	172
% Articulated Trucks	4.2%	**4.2%**	4.2%
Buses and Single-Unit Trucks	198	**198**	198
% Buses and Single-Unit Trucks	4.9%	**4.9%**	4.9%

*T: Thru

MM / US-360 EB Ramps On - ATR
Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 EB Ramps On - ATR

Thu Jul 29, 2021
AM Peak (Jul 29 2021 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound		
Time	T	**App**	**Int**
2021-07-29 7:15AM	82	**82**	**82**
7:30AM	93	**93**	**93**
7:45AM	92	**92**	**92**
8:00AM	69	**69**	**69**
Total	336	**336**	**336**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.903	**0.903**	0.903
Lights	307	**307**	307
% Lights	91.4%	**91.4%**	91.4%
Articulated Trucks	12	**12**	12
% Articulated Trucks	3.6%	**3.6%**	3.6%
Buses and Single-Unit Trucks	17	**17**	17
% Buses and Single-Unit Trucks	5.1%	**5.1%**	5.1%

*T: Thru

MM / US-360 EB Ramps On - ATR
Thu Jul 29, 2021
AM Peak (Jul 29 2021 7:15AM - 8:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 EB Ramps On - ATR

Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound		
Time	T	**App**	**Int**
2021-07-29 11:15AM	82	**82**	**82**
11:30AM	79	**79**	**79**
11:45AM	55	**55**	**55**
12:00PM	93	**93**	**93**
Total	309	**309**	**309**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.831	**0.831**	0.831
Lights	286	**286**	286
% Lights	92.6%	**92.6%**	92.6%
Articulated Trucks	10	**10**	10
% Articulated Trucks	3.2%	**3.2%**	3.2%
Buses and Single-Unit Trucks	13	**13**	13
% Buses and Single-Unit Trucks	4.2%	**4.2%**	4.2%

*T: Thru

MM / US-360 EB Ramps On - ATR
Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 EB Ramps On - ATR

Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	West Eastbound		
Time	T	**App**	**Int**
2021-07-29 4:30PM	97	**97**	**97**
4:45PM	99	**99**	**99**
5:00PM	141	**141**	**141**
5:15PM	94	**94**	**94**
Total	431	**431**	**431**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.764	**0.764**	0.764
Lights	403	**403**	403
% Lights	93.5%	**93.5%**	93.5%
Articulated Trucks	13	**13**	13
% Articulated Trucks	3.0%	**3.0%**	3.0%
Buses and Single-Unit Trucks	15	**15**	15
% Buses and Single-Unit Trucks	3.5%	**3.5%**	3.5%

*T: Thru

MM / US-360 EB Ramps On - ATR

Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858960, Location: 37.174389, -93.423848

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
2021-07-29 12:00AM	6	12	**18**	**18**
12:15AM	3	12	**15**	**15**
12:30AM	5	13	**18**	**18**
12:45AM	4	7	**11**	**11**
Hourly Total	18	44	**62**	**62**
1:00AM	2	7	**9**	**9**
1:15AM	3	13	**16**	**16**
1:30AM	2	15	**17**	**17**
1:45AM	4	10	**14**	**14**
Hourly Total	11	45	**56**	**56**
2:00AM	4	7	**11**	**11**
2:15AM	2	5	**7**	**7**
2:30AM	3	9	**12**	**12**
2:45AM	5	7	**12**	**12**
Hourly Total	14	28	**42**	**42**
3:00AM	6	16	**22**	**22**
3:15AM	10	13	**23**	**23**
3:30AM	11	12	**23**	**23**
3:45AM	15	12	**27**	**27**
Hourly Total	42	53	**95**	**95**
4:00AM	6	10	**16**	**16**
4:15AM	9	13	**22**	**22**
4:30AM	21	15	**36**	**36**
4:45AM	27	25	**52**	**52**
Hourly Total	63	63	**126**	**126**
5:00AM	19	19	**38**	**38**
5:15AM	33	26	**59**	**59**
5:30AM	44	35	**79**	**79**
5:45AM	59	37	**96**	**96**
Hourly Total	155	117	**272**	**272**
6:00AM	41	54	**95**	**95**
6:15AM	88	57	**145**	**145**
6:30AM	65	79	**144**	**144**
6:45AM	84	82	**166**	**166**
Hourly Total	278	272	**550**	**550**
7:00AM	63	89	**152**	**152**
7:15AM	75	110	**185**	**185**
7:30AM	71	95	**166**	**166**
7:45AM	79	97	**176**	**176**
Hourly Total	288	391	**679**	**679**
8:00AM	48	69	**117**	**117**
8:15AM	45	83	**128**	**128**
8:30AM	35	103	**138**	**138**
8:45AM	46	106	**152**	**152**
Hourly Total	174	361	**535**	**535**
9:00AM	44	124	**168**	**168**
9:15AM	45	110	**155**	**155**
9:30AM	46	104	**150**	**150**
9:45AM	47	98	**145**	**145**
Hourly Total	182	436	**618**	**618**
10:00AM	44	113	**157**	**157**
10:15AM	62	105	**167**	**167**
10:30AM	55	137	**192**	**192**
10:45AM	54	114	**168**	**168**

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
Hourly Total	215	469	**684**	**684**
11:00AM	40	121	**161**	**161**
11:15AM	55	131	**186**	**186**
11:30AM	52	116	**168**	**168**
11:45AM	42	131	**173**	**173**
Hourly Total	189	499	**688**	**688**
12:00PM	54	115	**169**	**169**
12:15PM	58	110	**168**	**168**
12:30PM	41	118	**159**	**159**
12:45PM	65	114	**179**	**179**
Hourly Total	218	457	**675**	**675**
1:00PM	44	128	**172**	**172**
1:15PM	52	103	**155**	**155**
1:30PM	48	137	**185**	**185**
1:45PM	56	127	**183**	**183**
Hourly Total	200	495	**695**	**695**
2:00PM	48	142	**190**	**190**
2:15PM	58	106	**164**	**164**
2:30PM	58	128	**186**	**186**
2:45PM	74	140	**214**	**214**
Hourly Total	238	516	**754**	**754**
3:00PM	65	125	**190**	**190**
3:15PM	75	150	**225**	**225**
3:30PM	73	142	**215**	**215**
3:45PM	65	139	**204**	**204**
Hourly Total	278	556	**834**	**834**
4:00PM	76	188	**264**	**264**
4:15PM	81	190	**271**	**271**
4:30PM	79	167	**246**	**246**
4:45PM	85	187	**272**	**272**
Hourly Total	321	732	**1053**	**1053**
5:00PM	81	178	**259**	**259**
5:15PM	101	213	**314**	**314**
5:30PM	83	146	**229**	**229**
5:45PM	66	138	**204**	**204**
Hourly Total	331	675	**1006**	**1006**
6:00PM	65	124	**189**	**189**
6:15PM	51	118	**169**	**169**
6:30PM	49	102	**151**	**151**
6:45PM	35	94	**129**	**129**
Hourly Total	200	438	**638**	**638**
7:00PM	36	87	**123**	**123**
7:15PM	39	85	**124**	**124**
7:30PM	44	91	**135**	**135**
7:45PM	35	70	**105**	**105**
Hourly Total	154	333	**487**	**487**
8:00PM	40	64	**104**	**104**
8:15PM	33	75	**108**	**108**
8:30PM	27	64	**91**	**91**
8:45PM	35	59	**94**	**94**
Hourly Total	135	262	**397**	**397**
9:00PM	23	53	**76**	**76**
9:15PM	30	45	**75**	**75**
9:30PM	28	41	**69**	**69**
9:45PM	29	43	**72**	**72**
Hourly Total	110	182	**292**	**292**
10:00PM	24	25	**49**	**49**
10:15PM	18	36	**54**	**54**
10:30PM	11	32	**43**	**43**
10:45PM	15	32	**47**	**47**

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
Hourly Total	68	125	**193**	**193**
11:00PM	18	15	**33**	**33**
11:15PM	9	29	**38**	**38**
11:30PM	10	16	**26**	**26**
11:45PM	7	13	**20**	**20**
Hourly Total	44	73	**117**	**117**
Total	3926	7622	**11548**	**11548**
% Approach	34.0%	66.0%	**-**	-
% Total	34.0%	66.0%	**100%**	-
Lights	3559	6771	**10330**	10330
% Lights	90.7%	88.8%	**89.5%**	89.5%
Articulated Trucks	139	681	**820**	820
% Articulated Trucks	3.5%	8.9%	**7.1%**	7.1%
Buses and Single-Unit Trucks	228	170	**398**	398
% Buses and Single-Unit Trucks	5.8%	2.2%	**3.4%**	3.4%

MM / US-360 WB Ramps Off - ATR
Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021
AM Peak (Jul 29 2021 10AM - 11 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
2021-07-29 10:00AM	44	113	**157**	**157**
10:15AM	62	105	**167**	**167**
10:30AM	55	137	**192**	**192**
10:45AM	54	114	**168**	**168**
Total	215	469	**684**	**684**
% Approach	31.4%	68.6%	**-**	-
% Total	31.4%	68.6%	**100%**	-
PHF	0.867	0.856	**0.891**	0.891
Lights	186	410	**596**	596
% Lights	86.5%	87.4%	**87.1%**	87.1%
Articulated Trucks	8	47	**55**	55
% Articulated Trucks	3.7%	10.0%	**8.0%**	8.0%
Buses and Single-Unit Trucks	21	12	**33**	33
% Buses and Single-Unit Trucks	9.8%	2.6%	**4.8%**	4.8%

MM / US-360 WB Ramps Off - ATR
Thu Jul 29, 2021
AM Peak (Jul 29 2021 10AM - 11 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
2021-07-29 11:15AM	55	131	**186**	**186**
11:30AM	52	116	**168**	**168**
11:45AM	42	131	**173**	**173**
12:00PM	54	115	**169**	**169**
Total	203	493	**696**	**696**
% Approach	29.2%	70.8%	**-**	-
% Total	29.2%	70.8%	**100%**	-
PHF	0.923	0.941	**0.935**	0.935
Lights	170	427	**597**	597
% Lights	83.7%	86.6%	**85.8%**	85.8%
Articulated Trucks	9	50	**59**	59
% Articulated Trucks	4.4%	10.1%	**8.5%**	8.5%
Buses and Single-Unit Trucks	24	16	**40**	40
% Buses and Single-Unit Trucks	11.8%	3.2%	**5.7%**	5.7%

MM / US-360 WB Ramps Off - ATR
Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps Off - ATR

Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound			
Time	Lane 1	Lane 2	**App**	**Int**
2021-07-29 4:30PM	79	167	**246**	**246**
4:45PM	85	187	**272**	**272**
5:00PM	81	178	**259**	**259**
5:15PM	101	213	**314**	**314**
Total	346	745	**1091**	**1091**
% Approach	31.7%	68.3%	**-**	-
% Total	31.7%	68.3%	**100%**	-
PHF	0.856	0.874	**0.869**	0.869
Lights	329	702	**1031**	1031
% Lights	95.1%	94.2%	**94.5%**	94.5%
Articulated Trucks	8	33	**41**	41
% Articulated Trucks	2.3%	4.4%	**3.8%**	3.8%
Buses and Single-Unit Trucks	9	10	**19**	19
% Buses and Single-Unit Trucks	2.6%	1.3%	**1.7%**	1.7%

MM / US-360 WB Ramps Off - ATR
Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858959, Location: 37.174065, -93.421986

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	**App**	**Int**
2021-07-29 12:00AM	1	**1**	**1**
12:15AM	2	**2**	**2**
12:30AM	1	**1**	**1**
12:45AM	1	**1**	**1**
Hourly Total	5	**5**	**5**
1:00AM	0	**0**	**0**
1:15AM	0	**0**	**0**
1:30AM	0	**0**	**0**
1:45AM	0	**0**	**0**
Hourly Total	0	**0**	**0**
2:00AM	1	**1**	**1**
2:15AM	3	**3**	**3**
2:30AM	0	**0**	**0**
2:45AM	0	**0**	**0**
Hourly Total	4	**4**	**4**
3:00AM	0	**0**	**0**
3:15AM	0	**0**	**0**
3:30AM	1	**1**	**1**
3:45AM	1	**1**	**1**
Hourly Total	2	**2**	**2**
4:00AM	0	**0**	**0**
4:15AM	1	**1**	**1**
4:30AM	2	**2**	**2**
4:45AM	2	**2**	**2**
Hourly Total	5	**5**	**5**
5:00AM	1	**1**	**1**
5:15AM	1	**1**	**1**
5:30AM	3	**3**	**3**
5:45AM	0	**0**	**0**
Hourly Total	5	**5**	**5**
6:00AM	3	**3**	**3**
6:15AM	1	**1**	**1**
6:30AM	3	**3**	**3**
6:45AM	5	**5**	**5**
Hourly Total	12	**12**	**12**
7:00AM	1	**1**	**1**
7:15AM	3	**3**	**3**
7:30AM	7	**7**	**7**
7:45AM	4	**4**	**4**
Hourly Total	15	**15**	**15**
8:00AM	4	**4**	**4**
8:15AM	3	**3**	**3**
8:30AM	2	**2**	**2**
8:45AM	3	**3**	**3**
Hourly Total	12	**12**	**12**
9:00AM	3	**3**	**3**
9:15AM	4	**4**	**4**
9:30AM	5	**5**	**5**
9:45AM	6	**6**	**6**
Hourly Total	18	**18**	**18**
10:00AM	5	**5**	**5**
10:15AM	4	**4**	**4**
10:30AM	2	**2**	**2**
10:45AM	5	**5**	**5**

Leg Direction	East Westbound		
Time	T	App	Int
Hourly Total	16	**16**	**16**
11:00AM	4	**4**	**4**
11:15AM	3	**3**	**3**
11:30AM	5	**5**	**5**
11:45AM	6	**6**	**6**
Hourly Total	18	**18**	**18**
12:00PM	5	**5**	**5**
12:15PM	3	**3**	**3**
12:30PM	2	**2**	**2**
12:45PM	6	**6**	**6**
Hourly Total	16	**16**	**16**
1:00PM	6	**6**	**6**
1:15PM	7	**7**	**7**
1:30PM	6	**6**	**6**
1:45PM	7	**7**	**7**
Hourly Total	26	**26**	**26**
2:00PM	5	**5**	**5**
2:15PM	4	**4**	**4**
2:30PM	5	**5**	**5**
2:45PM	4	**4**	**4**
Hourly Total	18	**18**	**18**
3:00PM	6	**6**	**6**
3:15PM	3	**3**	**3**
3:30PM	7	**7**	**7**
3:45PM	5	**5**	**5**
Hourly Total	21	**21**	**21**
4:00PM	4	**4**	**4**
4:15PM	3	**3**	**3**
4:30PM	7	**7**	**7**
4:45PM	8	**8**	**8**
Hourly Total	22	**22**	**22**
5:00PM	7	**7**	**7**
5:15PM	5	**5**	**5**
5:30PM	7	**7**	**7**
5:45PM	2	**2**	**2**
Hourly Total	21	**21**	**21**
6:00PM	13	**13**	**13**
6:15PM	1	**1**	**1**
6:30PM	9	**9**	**9**
6:45PM	3	**3**	**3**
Hourly Total	26	**26**	**26**
7:00PM	3	**3**	**3**
7:15PM	2	**2**	**2**
7:30PM	3	**3**	**3**
7:45PM	3	**3**	**3**
Hourly Total	11	**11**	**11**
8:00PM	2	**2**	**2**
8:15PM	3	**3**	**3**
8:30PM	2	**2**	**2**
8:45PM	1	**1**	**1**
Hourly Total	8	**8**	**8**
9:00PM	4	**4**	**4**
9:15PM	4	**4**	**4**
9:30PM	0	**0**	**0**
9:45PM	1	**1**	**1**
Hourly Total	9	**9**	**9**
10:00PM	0	**0**	**0**
10:15PM	1	**1**	**1**
10:30PM	3	**3**	**3**
10:45PM	2	**2**	**2**

Leg Direction	East Westbound		
Time	T	**App**	**Int**
Hourly Total	6	**6**	**6**
11:00PM	3	**3**	**3**
11:15PM	1	**1**	**1**
11:30PM	3	**3**	**3**
11:45PM	2	**2**	**2**
Hourly Total	9	**9**	**9**
Total	305	**305**	**305**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
Lights	196	**196**	196
% Lights	64.3%	**64.3%**	64.3%
Articulated Trucks	91	**91**	91
% Articulated Trucks	29.8%	**29.8%**	29.8%
Buses and Single-Unit Trucks	18	**18**	18
% Buses and Single-Unit Trucks	5.9%	**5.9%**	5.9%

*T: Thru

MM / US-360 WB Ramps On - ATR
Thu Jul 29, 2021
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021
AM Peak (Jul 29 2021 9:15AM - 10:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	**App**	**Int**
2021-07-29 9:15AM	4	**4**	**4**
9:30AM	5	**5**	**5**
9:45AM	6	**6**	**6**
10:00AM	5	**5**	**5**
Total	20	**20**	**20**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.833	**0.833**	0.833
Lights	15	**15**	15
% Lights	75.0%	**75.0%**	75.0%
Articulated Trucks	2	**2**	2
% Articulated Trucks	10.0%	**10.0%**	10.0%
Buses and Single-Unit Trucks	3	**3**	3
% Buses and Single-Unit Trucks	15.0%	**15.0%**	15.0%

*T: Thru

MM / US-360 WB Ramps On - ATR
Thu Jul 29, 2021
AM Peak (Jul 29 2021 9:15AM - 10:15 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	**App**	**Int**
2021-07-29 11:15AM	3	**3**	**3**
11:30AM	5	**5**	**5**
11:45AM	6	**6**	**6**
12:00PM	5	**5**	**5**
Total	19	**19**	**19**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.792	**0.792**	0.792
Lights	15	**15**	15
% Lights	78.9%	**78.9%**	78.9%
Articulated Trucks	1	**1**	1
% Articulated Trucks	5.3%	**5.3%**	5.3%
Buses and Single-Unit Trucks	3	**3**	3
% Buses and Single-Unit Trucks	15.8%	**15.8%**	15.8%

*T: Thru

MM / US-360 WB Ramps On - ATR
Thu Jul 29, 2021
Midday Peak (Jul 29 2021 11:15AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

MM / US-360 WB Ramps On - ATR

Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		
Time	T	**App**	**Int**
2021-07-29 4:30PM	7	**7**	**7**
4:45PM	8	**8**	**8**
5:00PM	7	**7**	**7**
5:15PM	5	**5**	**5**
Total	27	**27**	**27**
% Approach	100%	**-**	-
% Total	100%	**100%**	-
PHF	0.844	**0.844**	0.844
Lights	17	**17**	17
% Lights	63.0%	**63.0%**	63.0%
Articulated Trucks	8	**8**	8
% Articulated Trucks	29.6%	**29.6%**	29.6%
Buses and Single-Unit Trucks	2	**2**	2
% Buses and Single-Unit Trucks	7.4%	**7.4%**	7.4%

*T: Thru

MM / US-360 WB Ramps On - ATR
Thu Jul 29, 2021
PM Peak (Jul 29 2021 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 858962, Location: 37.177611, -93.425452

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Study Name MM / US-360 EB Ramps Off
Start Date 07/29/2021
Start Time 12:00 AM
Site Code

Channel	Lane 1	Lane 2			
Direction	Eastbound	Eastbound			
	(Exit Ramp)	(Mainline)	Total	Hourly Total	Peak Hours
12:00 AM	3	12	15		
12:15 AM	1	13	14		
12:30 AM	0	21	21		
12:45 AM	2	21	23	73	
1:00 AM	0	5	5	63	
1:15 AM	1	11	12	61	
1:30 AM	0	8	8	48	
1:45 AM	0	10	10	35	
2:00 AM	0	9	9	39	
2:15 AM	2	8	10	37	
2:30 AM	0	8	8	37	
2:45 AM	1	6	7	34	
3:00 AM	1	6	7	32	
3:15 AM	0	9	9	31	
3:30 AM	2	11	13	36	
3:45 AM	0	5	5	34	
4:00 AM	2	7	9	36	
4:15 AM	0	15	15	42	
4:30 AM	2	12	14	43	
4:45 AM	1	19	20	58	
5:00 AM	1	36	37	86	
5:15 AM	5	38	43	114	
5:30 AM	4	59	63	163	
5:45 AM	10	60	70	213	
6:00 AM	2	67	69	245	
6:15 AM	6	65	71	273	
6:30 AM	4	104	108	318	
6:45 AM	9	93	102	350	
7:00 AM	1	112	113	394	
7:15 AM	6	152	158	481	
7:30 AM	12	166	178	551	
7:45 AM	6	152	158	607	AM Peak Hour <--7-8am
8:00 AM	6	99	105	599	
8:15 AM	2	138	140	581	
8:30 AM	3	139	142	545	
8:45 AM	5	136	141	528	
9:00 AM	4	105	109	532	
9:15 AM	5	121	126	518	
9:30 AM	2	120	122	498	
9:45 AM	3	150	153	510	
10:00 AM	2	103	105	506	
10:15 AM	7	123	130	510	
10:30 AM	4	96	100	488	
10:45 AM	4	115	119	454	
11:00 AM	4	98	102	451	
11:15 AM	2	134	136	457	
11:30 AM	5	120	125	482	
11:45 AM	6	129	135	498	
12:00 PM	8	124	132	528	
12:15 PM	7	118	125	517	
12:30 PM	7	114	121	513	
12:45 PM	2	106	108	486	
1:00 PM	4	132	136	490	
1:15 PM	5	126	131	496	
1:30 PM	9	128	137	512	
1:45 PM	2	150	152	556	
2:00 PM	3	131	134	554	
2:15 PM	2	100	102	525	
2:30 PM	5	120	125	513	
2:45 PM	7	147	154	515	
3:00 PM	3	122	125	506	
3:15 PM	3	148	151	555	
3:30 PM	9	169	178	608	
3:45 PM	10	168	178	632	
4:00 PM	7	147	154	661	
4:15 PM	5	142	147	657	
4:30 PM	8	176	184	663	
4:45 PM	6	168	174	659	
5:00 PM	6	134	140	645	
5:15 PM	12	171	183	681	PM Peak Hour <--4:30-5:30pm
5:30 PM	4	123	127	624	
5:45 PM	7	122	129	579	
6:00 PM	5	124	129	568	
6:15 PM	2	107	109	494	
6:30 PM	7	98	105	472	
6:45 PM	2	96	98	441	
7:00 PM	3	77	80	392	
7:15 PM	4	88	92	375	
7:30 PM	3	72	75	345	
7:45 PM	2	64	66	313	
8:00 PM	2	81	83	316	
8:15 PM	5	82	87	311	
8:30 PM	3	57	60	296	
8:45 PM	1	35	36	266	
9:00 PM	5	62	67	250	
9:15 PM	1	61	62	225	
9:30 PM	2	37	39	204	
9:45 PM	3	49	52	220	
10:00 PM	2	35	37	190	
10:15 PM	0	30	30	158	
10:30 PM	2	31	33	152	
10:45 PM	2	27	29	129	
11:00 PM	1	30	31	123	
11:15 PM	2	26	28	121	
11:30 PM	1	18	19	107	
11:45 PM	2	31	33	111	

Route M / FR 103 - TMC

Thu Jul 29, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

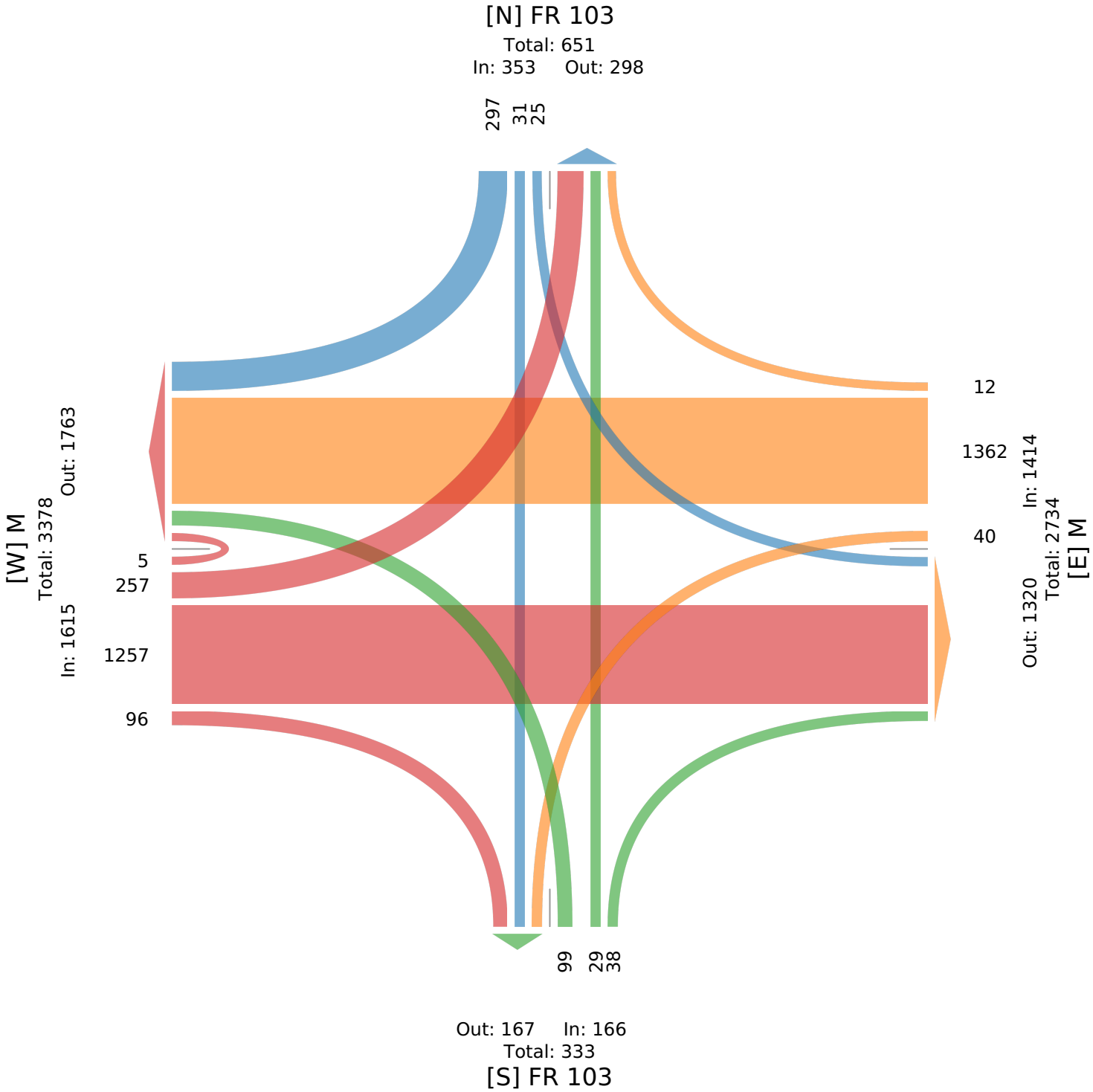
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	FR 103					M					FR 103					M					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2021-07-29 7:00AM	6	0	1	0	**7**	1	20	2	0	**23**	1	0	1	0	**2**	2	88	24	0	**114**	**146**
7:15AM	11	4	0	0	**15**	0	37	5	0	**42**	1	3	2	0	**6**	7	104	29	0	**140**	**203**
7:30AM	11	7	2	0	**20**	1	46	4	0	**51**	4	5	10	0	**19**	22	130	33	0	**185**	**275**
7:45AM	6	7	1	0	**14**	1	42	5	0	**48**	8	3	24	0	**35**	30	98	14	0	**142**	**239**
Hourly Total	34	18	4	0	**56**	3	145	16	0	**164**	14	11	37	0	**62**	61	420	100	0	**581**	**863**
8:00AM	7	0	1	0	**8**	0	43	3	0	**46**	2	0	2	0	**4**	1	86	15	2	**104**	**162**
8:15AM	8	2	1	0	**11**	0	32	1	0	**33**	0	0	0	0	**0**	0	74	14	0	**88**	**132**
8:30AM	6	1	1	0	**8**	1	41	1	0	**43**	2	0	1	0	**3**	2	83	19	0	**104**	**158**
8:45AM	5	4	0	0	**9**	1	39	3	0	**43**	2	4	5	0	**11**	2	76	19	0	**97**	**160**
Hourly Total	26	7	3	0	**36**	2	155	8	0	**165**	6	4	8	0	**18**	5	319	67	2	**393**	**612**
4:00PM	23	0	0	0	**23**	0	83	0	0	**83**	1	0	0	0	**1**	0	57	4	1	**62**	**169**
4:15PM	27	0	2	0	**29**	0	131	0	0	**131**	0	0	0	0	**0**	1	71	6	2	**80**	**240**
4:30PM	30	0	0	0	**30**	0	123	2	0	**125**	0	2	0	0	**2**	4	65	19	0	**88**	**245**
4:45PM	34	5	2	0	**41**	0	148	7	0	**155**	1	1	2	0	**4**	14	68	12	0	**94**	**294**
Hourly Total	114	5	4	0	**123**	0	485	9	0	**494**	2	3	2	0	**7**	19	261	41	3	**324**	**948**
5:00PM	30	0	5	0	**35**	3	145	5	0	**153**	12	9	45	0	**66**	7	57	12	0	**76**	**330**
5:15PM	43	0	1	0	**44**	0	171	1	0	**172**	4	1	3	0	**8**	2	54	8	0	**64**	**288**
5:30PM	31	1	1	0	**33**	3	144	0	0	**147**	0	0	4	0	**4**	2	64	15	0	**81**	**265**
5:45PM	19	0	7	0	**26**	1	117	1	0	**119**	0	1	0	0	**1**	0	82	14	0	**96**	**242**
Hourly Total	123	1	14	0	**138**	7	577	7	0	**591**	16	11	52	0	**79**	11	257	49	0	**317**	**1125**
Total	297	31	25	0	**353**	12	1362	40	0	**1414**	38	29	99	0	**166**	96	1257	257	5	**1615**	**3548**
% Approach	84.1%	8.8%	7.1%	0%	**-**	0.8%	96.3%	2.8%	0%	**-**	22.9%	17.5%	59.6%	0%	**-**	5.9%	77.8%	15.9%	0.3%	**-**	-
% Total	8.4%	0.9%	0.7%	0%	**9.9%**	0.3%	38.4%	1.1%	0%	**39.9%**	1.1%	0.8%	2.8%	0%	**4.7%**	2.7%	35.4%	7.2%	0.1%	**45.5%**	-
Lights	293	31	25	0	**349**	12	1348	40	0	**1400**	38	29	98	0	**165**	96	1246	254	5	**1601**	3515
% Lights	98.7%	100%	100%	0%	**98.9%**	100%	99.0%	100%	0%	**99.0%**	100%	100%	99.0%	0%	**99.4%**	100%	99.1%	98.8%	100%	**99.1%**	99.1%
Articulated Trucks and Single-Unit Trucks	4	0	0	0	**4**	0	13	0	0	**13**	0	0	1	0	**1**	0	11	3	0	**14**	32
% Articulated Trucks and Single-Unit Trucks	1.3%	0%	0%	0%	**1.1%**	0%	1.0%	0%	0%	**0.9%**	0%	0%	1.0%	0%	**0.6%**	0%	0.9%	1.2%	0%	**0.9%**	0.9%
Buses	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	1
% Buses	0%	0%	0%	0%	**0%**	0%	0.1%	0%	0%	**0.1%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / FR 103 - TMC
Thu Jul 29, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Route M / FR 103 - TMC

Thu Jul 29, 2021
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

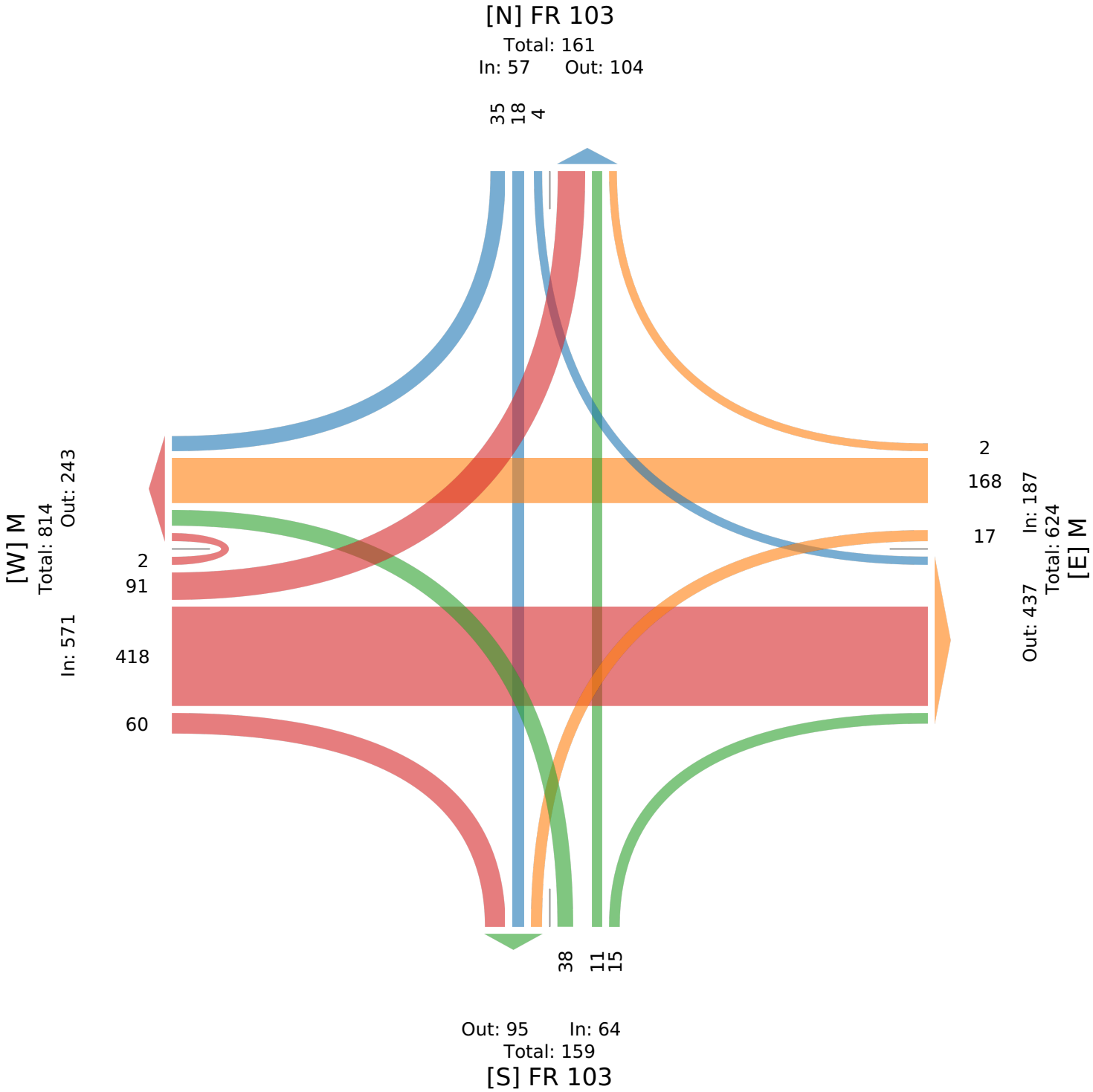
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	FR 103					M					FR 103					M					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2021-07-29 7:15AM	11	4	0	0	**15**	0	37	5	0	**42**	1	3	2	0	**6**	7	104	29	0	**140**	**203**
7:30AM	11	7	2	0	**20**	1	46	4	0	**51**	4	5	10	0	**19**	22	130	33	0	**185**	**275**
7:45AM	6	7	1	0	**14**	1	42	5	0	**48**	8	3	24	0	**35**	30	98	14	0	**142**	**239**
8:00AM	7	0	1	0	**8**	0	43	3	0	**46**	2	0	2	0	**4**	1	86	15	2	**104**	**162**
Total	35	18	4	0	**57**	2	168	17	0	**187**	15	11	38	0	**64**	60	418	91	2	**571**	**879**
% Approach	61.4%	31.6%	7.0%	0%	**-**	1.1%	89.8%	9.1%	0%	**-**	23.4%	17.2%	59.4%	0%	**-**	10.5%	73.2%	15.9%	0.4%	**-**	-
% Total	4.0%	2.0%	0.5%	0%	**6.5%**	0.2%	19.1%	1.9%	0%	**21.3%**	1.7%	1.3%	4.3%	0%	**7.3%**	6.8%	47.6%	10.4%	0.2%	**65.0%**	-
PHF	0.795	0.643	0.500	-	**0.713**	0.500	0.913	0.850	-	**0.917**	0.469	0.550	0.396	-	**0.457**	0.500	0.804	0.689	0.250	**0.772**	0.799
Lights	33	18	4	0	**55**	2	160	17	0	**179**	15	11	37	0	**63**	60	417	89	2	**568**	865
% Lights	94.3%	100%	100%	0%	**96.5%**	100%	95.2%	100%	0%	**95.7%**	100%	100%	97.4%	0%	**98.4%**	100%	99.8%	97.8%	100%	**99.5%**	98.4%
Articulated Trucks and Single-Unit Trucks	2	0	0	0	**2**	0	8	0	0	**8**	0	0	1	0	**1**	0	1	2	0	**3**	14
% Articulated Trucks and Single-Unit Trucks	5.7%	0%	0%	0%	**3.5%**	0%	4.8%	0%	0%	**4.3%**	0%	0%	2.6%	0%	**1.6%**	0%	0.2%	2.2%	0%	**0.5%**	1.6%
Buses	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0
% Buses	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / FR 103 - TMC
Thu Jul 29, 2021
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Route M / FR 103 - TMC

Thu Jul 29, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

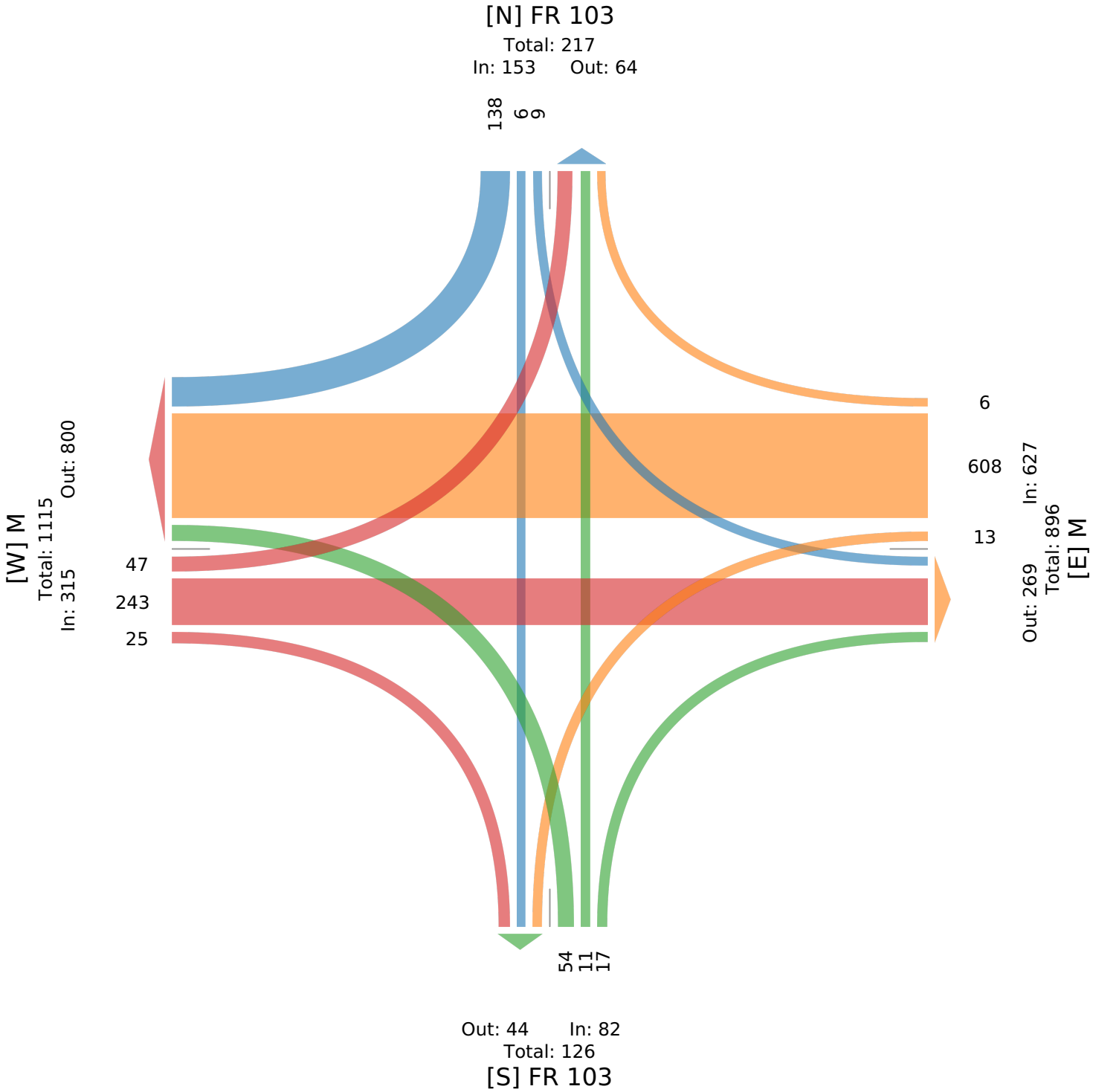
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	FR 103					M					FR 103					M					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2021-07-29 4:45PM	34	5	2	0	**41**	0	148	7	0	**155**	1	1	2	0	**4**	14	68	12	0	**94**	**294**
5:00PM	30	0	5	0	**35**	3	145	5	0	**153**	12	9	45	0	**66**	7	57	12	0	**76**	**330**
5:15PM	43	0	1	0	**44**	0	171	1	0	**172**	4	1	3	0	**8**	2	54	8	0	**64**	**288**
5:30PM	31	1	1	0	**33**	3	144	0	0	**147**	0	0	4	0	**4**	2	64	15	0	**81**	**265**
Total	138	6	9	0	**153**	6	608	13	0	**627**	17	11	54	0	**82**	25	243	47	0	**315**	**1177**
% Approach	90.2%	3.9%	5.9%	0%	**-**	1.0%	97.0%	2.1%	0%	**-**	20.7%	13.4%	65.9%	0%	**-**	7.9%	77.1%	14.9%	0%	**-**	-
% Total	11.7%	0.5%	0.8%	0%	**13.0%**	0.5%	51.7%	1.1%	0%	**53.3%**	1.4%	0.9%	4.6%	0%	**7.0%**	2.1%	20.6%	4.0%	0%	**26.8%**	-
PHF	0.802	0.300	0.450	-	**0.869**	0.500	0.889	0.464	-	**0.911**	0.354	0.306	0.300	-	**0.311**	0.446	0.893	0.783	-	**0.838**	0.892
Lights	137	6	9	0	**152**	6	606	13	0	**625**	17	11	54	0	**82**	25	241	46	0	**312**	1171
% Lights	99.3%	100%	100%	0%	**99.3%**	100%	99.7%	100%	0%	**99.7%**	100%	100%	100%	0%	**100%**	100%	99.2%	97.9%	0%	**99.0%**	99.5%
Articulated Trucks and Single-Unit Trucks	1	0	0	0	**1**	0	1	0	0	**1**	0	0	0	0	**0**	0	2	1	0	**3**	5
% Articulated Trucks and Single-Unit Trucks	0.7%	0%	0%	0%	**0.7%**	0%	0.2%	0%	0%	**0.2%**	0%	0%	0%	0%	**0%**	0%	0.8%	2.1%	0%	**1.0%**	0.4%
Buses	0	0	0	0	**0**	0	1	0	0	**1**	0	0	0	0	**0**	0	0	0	0	**0**	1
% Buses	0%	0%	0%	0%	**0%**	0%	0.2%	0%	0%	**0.2%**	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	**0%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / FR 103 - TMC
Thu Jul 29, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858958, Location: 37.139344, -93.415873

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Route M / Route ZZ - TMC

Thu Jul 29, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

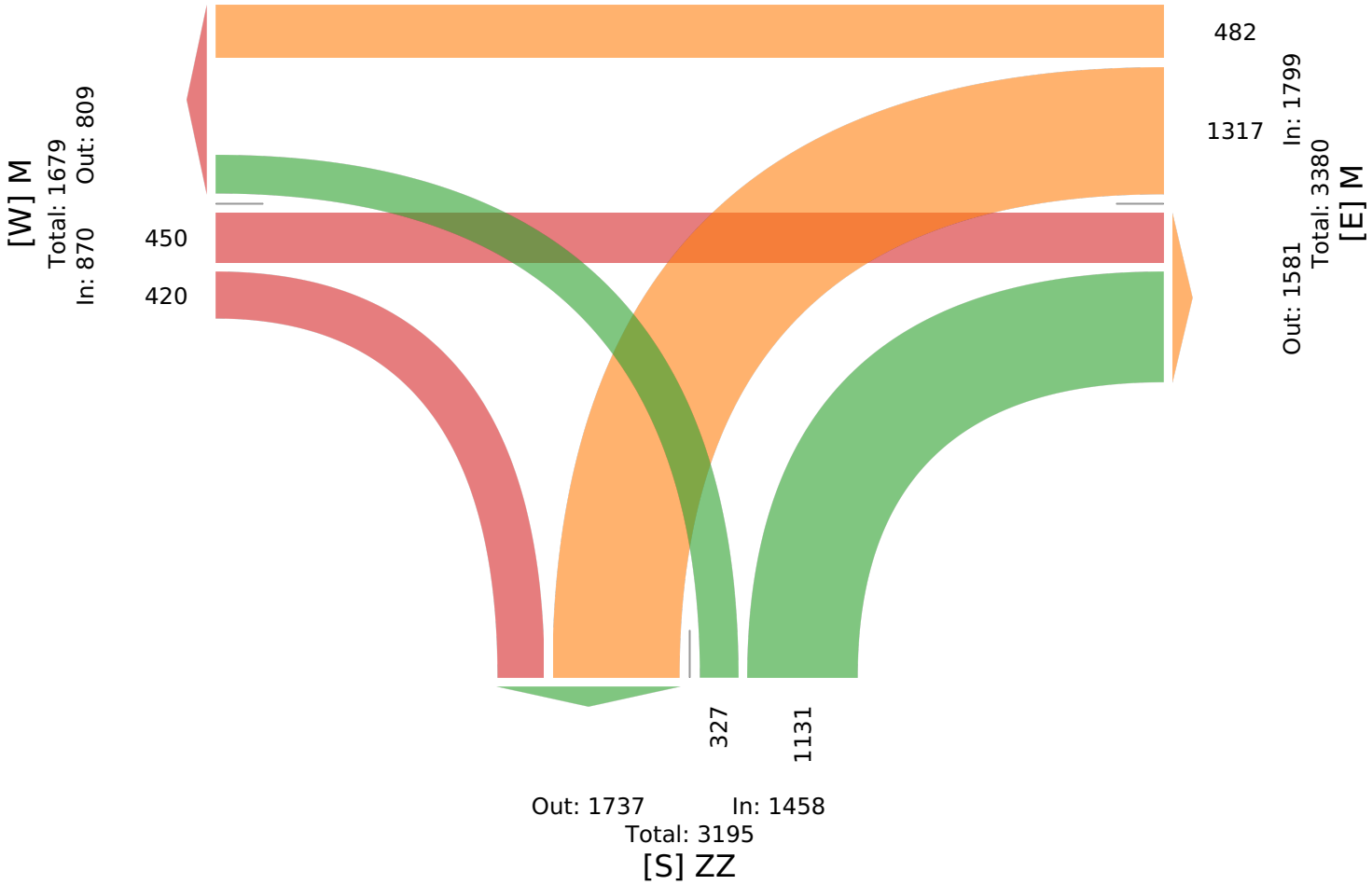
GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	M				ZZ				M				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2021-07-29 7:00AM	9	20	0	**29**	98	39	0	**137**	10	17	0	**27**	**193**
7:15AM	19	31	0	**50**	107	34	0	**141**	14	28	0	**42**	**233**
7:30AM	34	35	0	**69**	147	41	0	**188**	17	38	0	**55**	**312**
7:45AM	38	32	0	**70**	100	34	0	**134**	16	38	0	**54**	**258**
Hourly Total	100	118	0	**218**	452	148	0	**600**	57	121	0	**178**	**996**
8:00AM	23	34	0	**57**	84	18	0	**102**	9	18	0	**27**	**186**
8:15AM	20	22	0	**42**	65	11	0	**76**	18	19	0	**37**	**155**
8:30AM	17	28	0	**45**	83	16	0	**99**	16	22	0	**38**	**182**
8:45AM	30	21	0	**51**	63	17	0	**80**	13	30	0	**43**	**174**
Hourly Total	90	105	0	**195**	295	62	0	**357**	56	89	0	**145**	**697**
4:00PM	18	93	0	**111**	31	22	0	**53**	45	27	0	**72**	**236**
4:15PM	35	122	0	**157**	46	12	0	**58**	31	25	0	**56**	**271**
4:30PM	31	110	0	**141**	50	20	0	**70**	36	46	0	**82**	**293**
4:45PM	39	155	0	**194**	51	12	0	**63**	27	27	0	**54**	**311**
Hourly Total	123	480	0	**603**	178	66	0	**244**	139	125	0	**264**	**1111**
5:00PM	51	174	0	**225**	50	11	0	**61**	44	30	0	**74**	**360**
5:15PM	50	170	0	**220**	33	16	0	**49**	40	31	0	**71**	**340**
5:30PM	35	157	0	**192**	55	8	0	**63**	48	28	0	**76**	**331**
5:45PM	33	113	0	**146**	68	16	0	**84**	36	26	0	**62**	**292**
Hourly Total	169	614	0	**783**	206	51	0	**257**	168	115	0	**283**	**1323**
Total	482	1317	0	**1799**	1131	327	0	**1458**	420	450	0	**870**	**4127**
% Approach	26.8%	73.2%	0%	**-**	77.6%	22.4%	0%	**-**	48.3%	51.7%	0%	**-**	-
% Total	11.7%	31.9%	0%	**43.6%**	27.4%	7.9%	0%	**35.3%**	10.2%	10.9%	0%	**21.1%**	-
Lights	469	1305	0	**1774**	1122	317	0	**1439**	411	444	0	**855**	4068
% Lights	97.3%	99.1%	0%	**98.6%**	99.2%	96.9%	0%	**98.7%**	97.9%	98.7%	0%	**98.3%**	98.6%
Articulated Trucks and Single-Unit Trucks	13	11	0	**24**	9	10	0	**19**	8	6	0	**14**	57
% Articulated Trucks and Single-Unit Trucks	2.7%	0.8%	0%	**1.3%**	0.8%	3.1%	0%	**1.3%**	1.9%	1.3%	0%	**1.6%**	1.4%
Buses	0	1	0	**1**	0	0	0	**0**	1	0	0	**1**	2
% Buses	0%	0.1%	0%	**0.1%**	0%	0%	0%	**0%**	0.2%	0%	0%	**0.1%**	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / Route ZZ - TMC
Thu Jul 29, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Route M / Route ZZ - TMC

Thu Jul 29, 2021
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

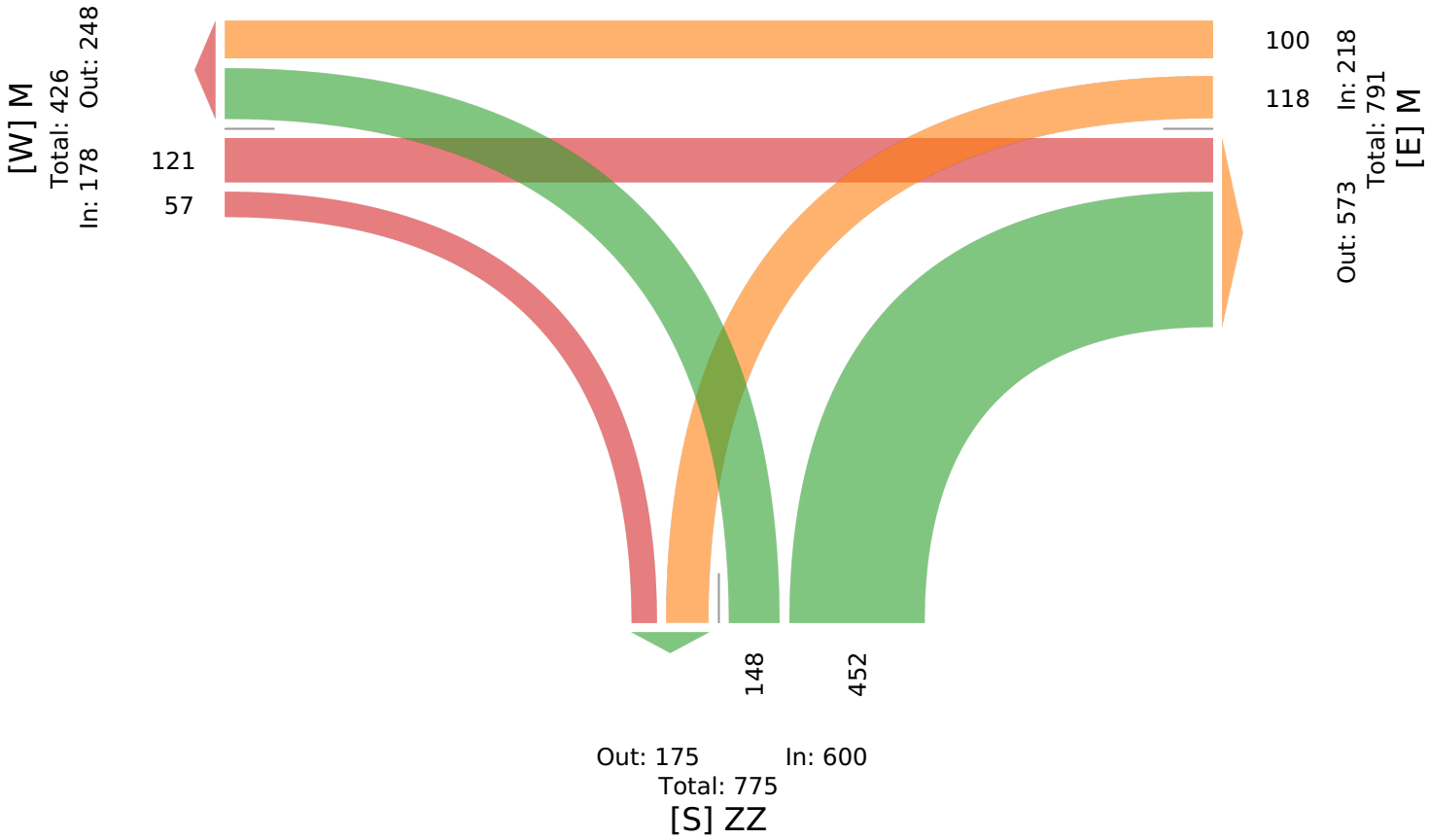
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	M				ZZ				M				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2021-07-29 7:00AM	9	20	0	**29**	98	39	0	**137**	10	17	0	**27**	**193**
7:15AM	19	31	0	**50**	107	34	0	**141**	14	28	0	**42**	**233**
7:30AM	34	35	0	**69**	147	41	0	**188**	17	38	0	**55**	**312**
7:45AM	38	32	0	**70**	100	34	0	**134**	16	38	0	**54**	**258**
Total	100	118	0	**218**	452	148	0	**600**	57	121	0	**178**	**996**
% Approach	45.9%	54.1%	0%	**-**	75.3%	24.7%	0%	**-**	32.0%	68.0%	0%	**-**	-
% Total	10.0%	11.8%	0%	**21.9%**	45.4%	14.9%	0%	**60.2%**	5.7%	12.1%	0%	**17.9%**	-
PHF	0.658	0.843	-	**0.779**	0.769	0.902	-	**0.798**	0.838	0.796	-	**0.809**	0.798
Lights	94	113	0	**207**	450	146	0	**596**	53	121	0	**174**	977
% Lights	94.0%	95.8%	0%	**95.0%**	99.6%	98.6%	0%	**99.3%**	93.0%	100%	0%	**97.8%**	98.1%
Articulated Trucks and Single-Unit Trucks	6	5	0	**11**	2	2	0	**4**	3	0	0	**3**	18
% Articulated Trucks and Single-Unit Trucks	6.0%	4.2%	0%	**5.0%**	0.4%	1.4%	0%	**0.7%**	5.3%	0%	0%	**1.7%**	1.8%
Buses	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1
% Buses	0%	0%	0%	**0%**	0%	0%	0%	**0%**	1.8%	0%	0%	**0.6%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / Route ZZ - TMC
Thu Jul 29, 2021
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Route M / Route ZZ - TMC

Thu Jul 29, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

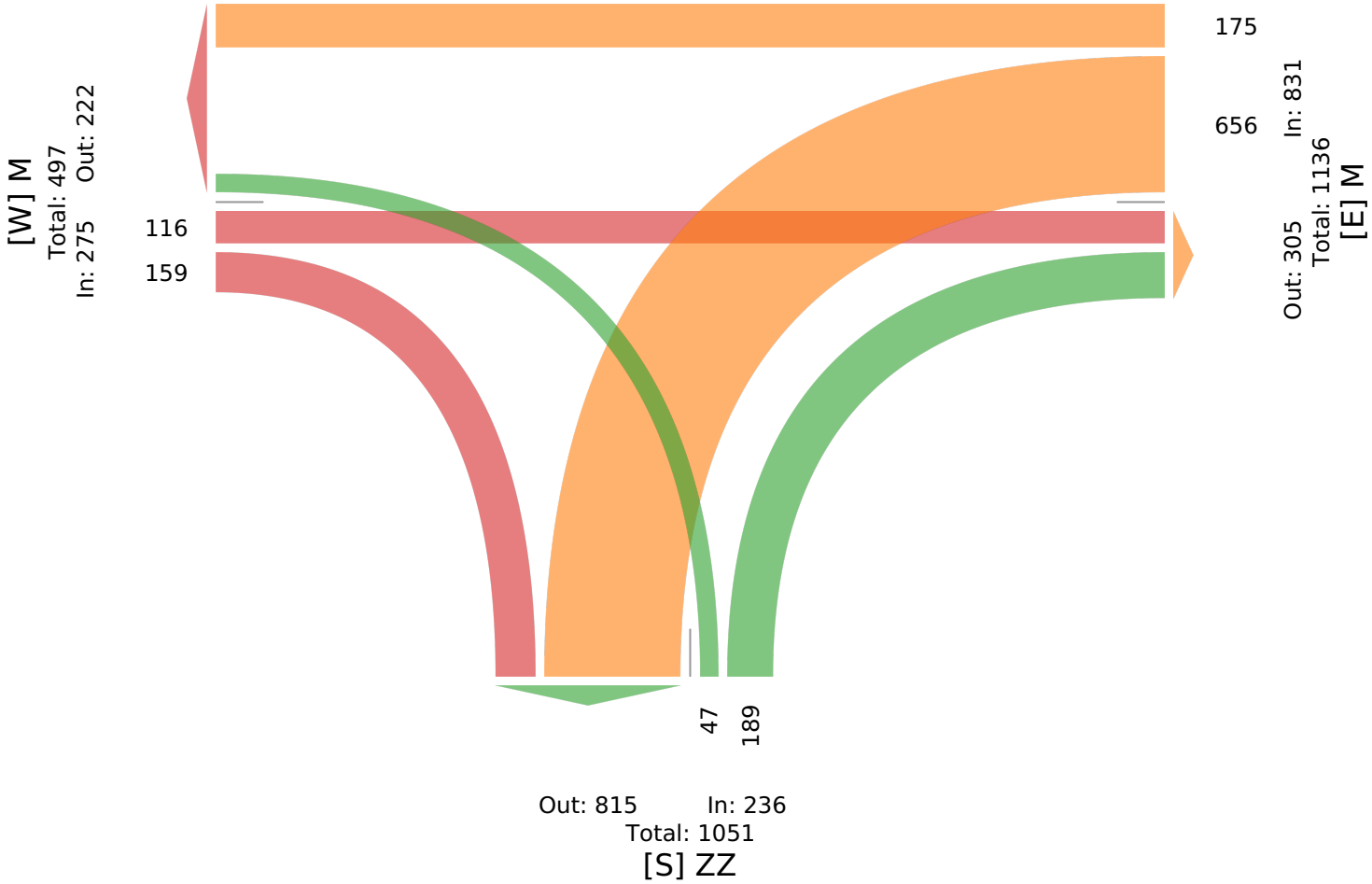
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	M				ZZ				M				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
2021-07-29 4:45PM	39	155	0	**194**	51	12	0	**63**	27	27	0	**54**	**311**
5:00PM	51	174	0	**225**	50	11	0	**61**	44	30	0	**74**	**360**
5:15PM	50	170	0	**220**	33	16	0	**49**	40	31	0	**71**	**340**
5:30PM	35	157	0	**192**	55	8	0	**63**	48	28	0	**76**	**331**
Total	175	656	0	**831**	189	47	0	**236**	159	116	0	**275**	**1342**
% Approach	21.1%	78.9%	0%	**-**	80.1%	19.9%	0%	**-**	57.8%	42.2%	0%	**-**	-
% Total	13.0%	48.9%	0%	**61.9%**	14.1%	3.5%	0%	**17.6%**	11.8%	8.6%	0%	**20.5%**	-
PHF	0.858	0.943	-	**0.923**	0.859	0.734	-	**0.937**	0.828	0.935	-	**0.905**	0.932
Lights	174	653	0	**827**	186	44	0	**230**	157	115	0	**272**	1329
% Lights	99.4%	99.5%	0%	**99.5%**	98.4%	93.6%	0%	**97.5%**	98.7%	99.1%	0%	**98.9%**	99.0%
Articulated Trucks and Single-Unit Trucks	1	2	0	**3**	3	3	0	**6**	2	1	0	**3**	12
% Articulated Trucks and Single-Unit Trucks	0.6%	0.3%	0%	**0.4%**	1.6%	6.4%	0%	**2.5%**	1.3%	0.9%	0%	**1.1%**	0.9%
Buses	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	1
% Buses	0%	0.2%	0%	**0.1%**	0%	0%	0%	**0%**	0%	0%	0%	**0%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Route M / Route ZZ - TMC
Thu Jul 29, 2021
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses)
All Movements
ID: 858957, Location: 37.139602, -93.420215

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



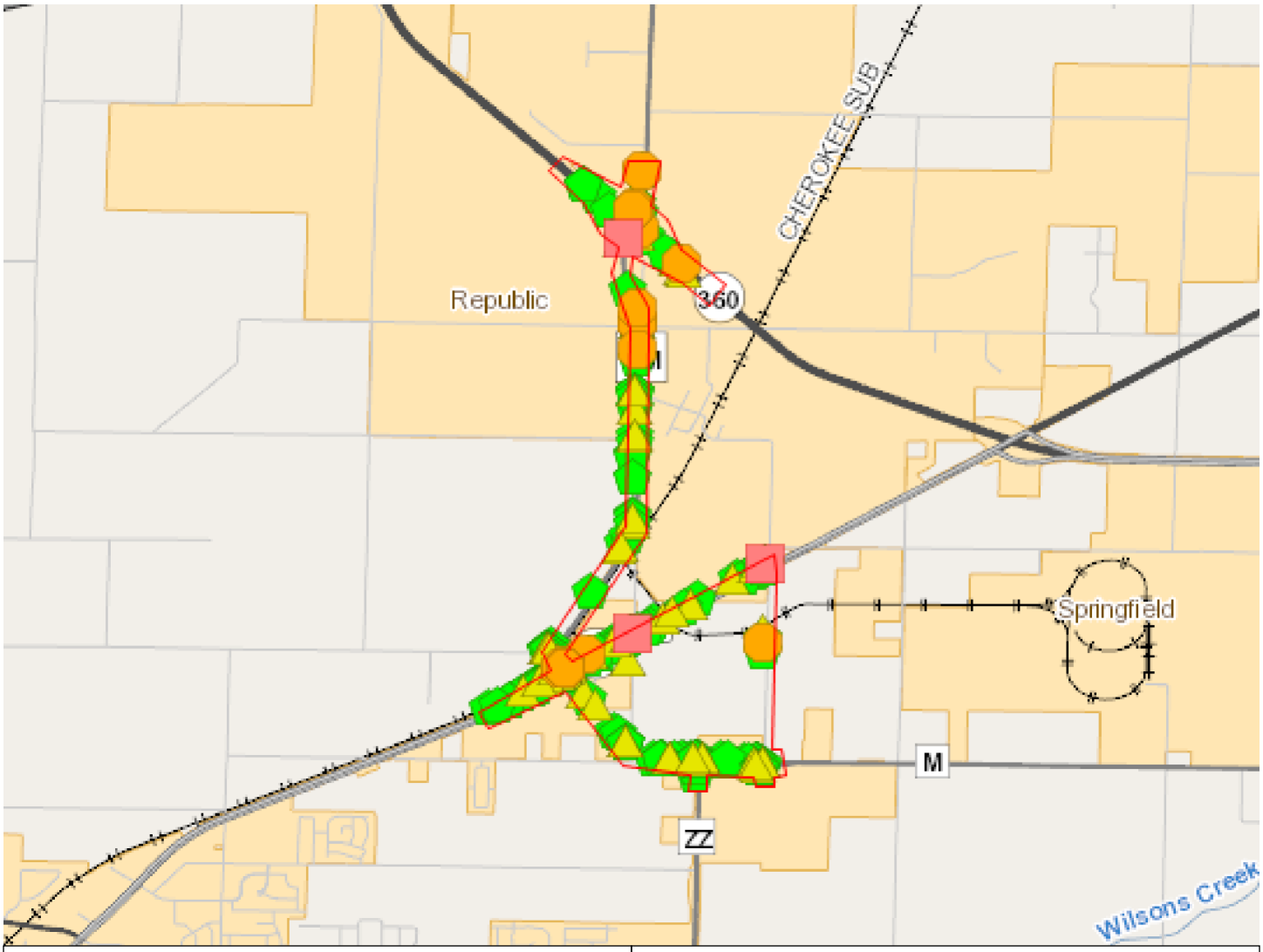
Crash Data

MoDOT Safety Data Zone Crash Tool

This PDF generated on August 12, 2021.

NOTE: The crash data contained in this PDF may not be as current as the date of this PDF.

Route MM / ZZ Corridor Study. Includes Full Year Crash History 2015-2019. Includes 2020-2021 incomplete data years.



Crash Totals		Personal Injury Totals	
Fatal Crashes	3	Fatalities	3
Serious Injury Crashes	16	Serious Injuries	18
Minor Injury Crashes	92	Minor Injuries	138
PDO Crashes	298		
Total Crashes	409		

Criteria: ACCIDENT_YEAR in (2021,2020,2019,2018,2017,2016,2015) AND NOT(LONG_SHORT_FORM = 'N') AND SDO_ANYINTERACT(SHAPE,MDSYS.SDO_GEOMETRY(2003,8307,NULL,SDO_ELEM_INFO_ARRAY(1,1003,1),SDO_ORDINATE_ARRAY(-93.4295246019851,37.18101179748559,-93.43045973016038,37.179948178415984,-93.42798984963633,37.17784235542582,-93.42686198511957,37.17565801022246,-93.42571984383677,37.17470146689812,-93.42611959328575,37.173088192336174,-93.42486323787466,37.16920491197465,-93.42514639373437,37.15579902866781,-93.4309498991276,37.14732100910404,-93.43023606082585,37.14606465369296,-93.43511871480982,37.143180746953895,-93.43449053710428,37.1421242662673,-

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93.42080387739874,37.13898337773961,-93.42094664505909,37.13781268292474,-
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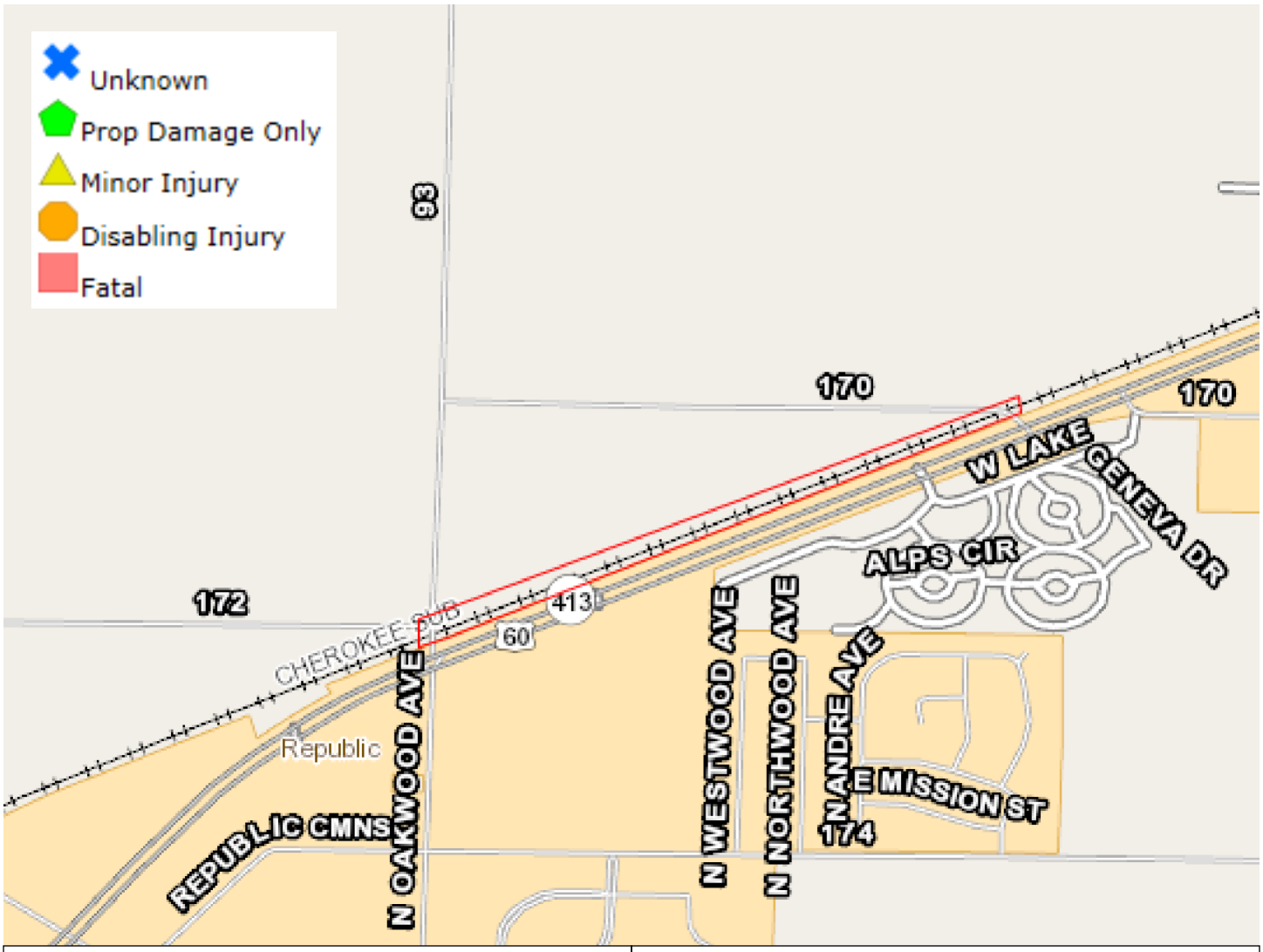
MoDOT Safety Data Zone Crash Tool

This PDF generated on September 7, 2021.

NOTE: The crash data contained in this PDF may not be as current as the date of this PDF.

Route MM/ZZ Corridor Study. Includes Full Year Crash History 2015-2019. Includes 2020-2021 incomplete data years.



Crash Totals		Personal Injury Totals	
Fatal Crashes	0	Fatalities	0
Serious Injury Crashes	0	Serious Injuries	0
Minor Injury Crashes	0	Minor Injuries	0
PDO Crashes	0		
Total Crashes	0		

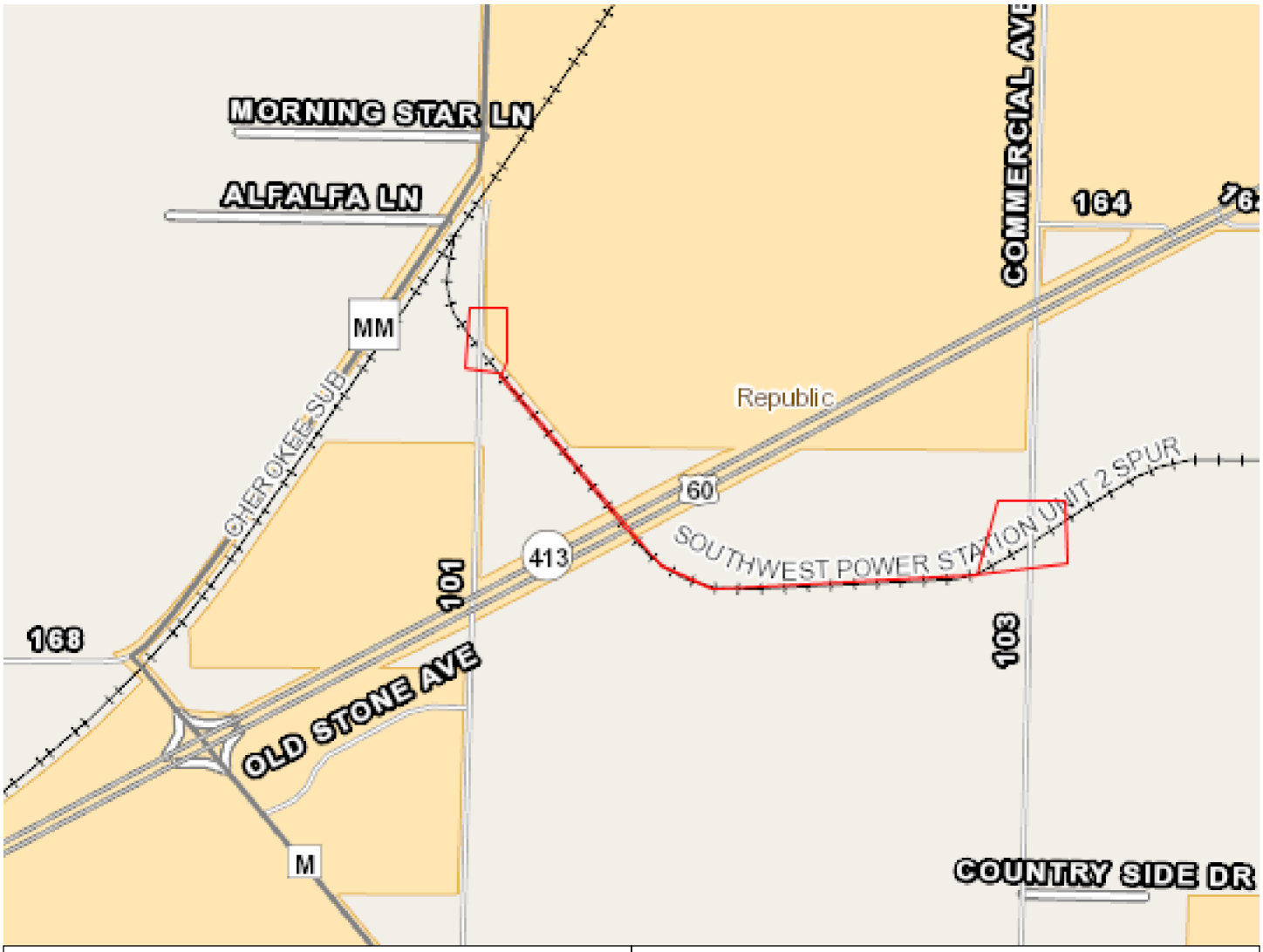
Criteria: ACCIDENT_YEAR in (2021,2020,2019,2018,2017,2016,2015) AND NOT(LONG_SHORT_FORM = 'N') AND SDO_ANYINTERACT(SHAPE,MDSYS.SDO_GEOMETRY(2003,8307,NULL,SDO_ELEM_INFO_ARRAY(1,1003,1),SDO_ORDINATE_ARRAY(-93.4526529856686,37.136563465896664,-93.45266726243464,37.136106609383546,-93.45219612915548,37.136249377043896,-93.44283057063652,37.139961336213,-93.44287340093463,37.14020404123559,-93.4526529856686,37.136563465896664))) = 'TRUE'

MoDOT Safety Data Zone Crash Tool

This PDF generated on September 7, 2021.

NOTE: The crash data contained in this PDF may not be as current as the date of this PDF.

Route MM/ZZ Corridor Study. Includes Full Year Crash History 2015-2019. Includes 2020-2021 incomplete data years.



Crash Totals		Personal Injury Totals	
Fatal Crashes	0	Fatalities	0
Serious Injury Crashes	0	Serious Injuries	0
Minor Injury Crashes	0	Minor Injuries	0
PDO Crashes	0		
Total Crashes	0		

Criteria: ACCIDENT_YEAR in (2021,2020,2019,2018,2017,2016,2015) AND NOT(LONG_SHORT_FORM = 'N') AND SDO_ANYINTERACT(SHAPE,MDSYS.SDO_GEOMETRY(2003,8307,NULL,SDO_ELEM_INFO_ARRAY(1,1003,1),SDO_ORDINATE_ARRAY(-93.42468718046705,37.15291036300674,-93.42408755629359,37.15291036300674,-93.42407327952755,37.152025203512565,-93.42418749365582,37.1517539449579,-93.42213163934679,37.14928406443385,-93.42154629193935,37.148684440260375,-93.42071823950931,37.14831324434347,-93.41649231676296,37.148527395833995,-93.41495042603117,37.14872727055848,-93.41499325632928,37.14974092094697,-93.41607829054794,37.14976947447904,-93.41640665616674,37.14855594936606,-

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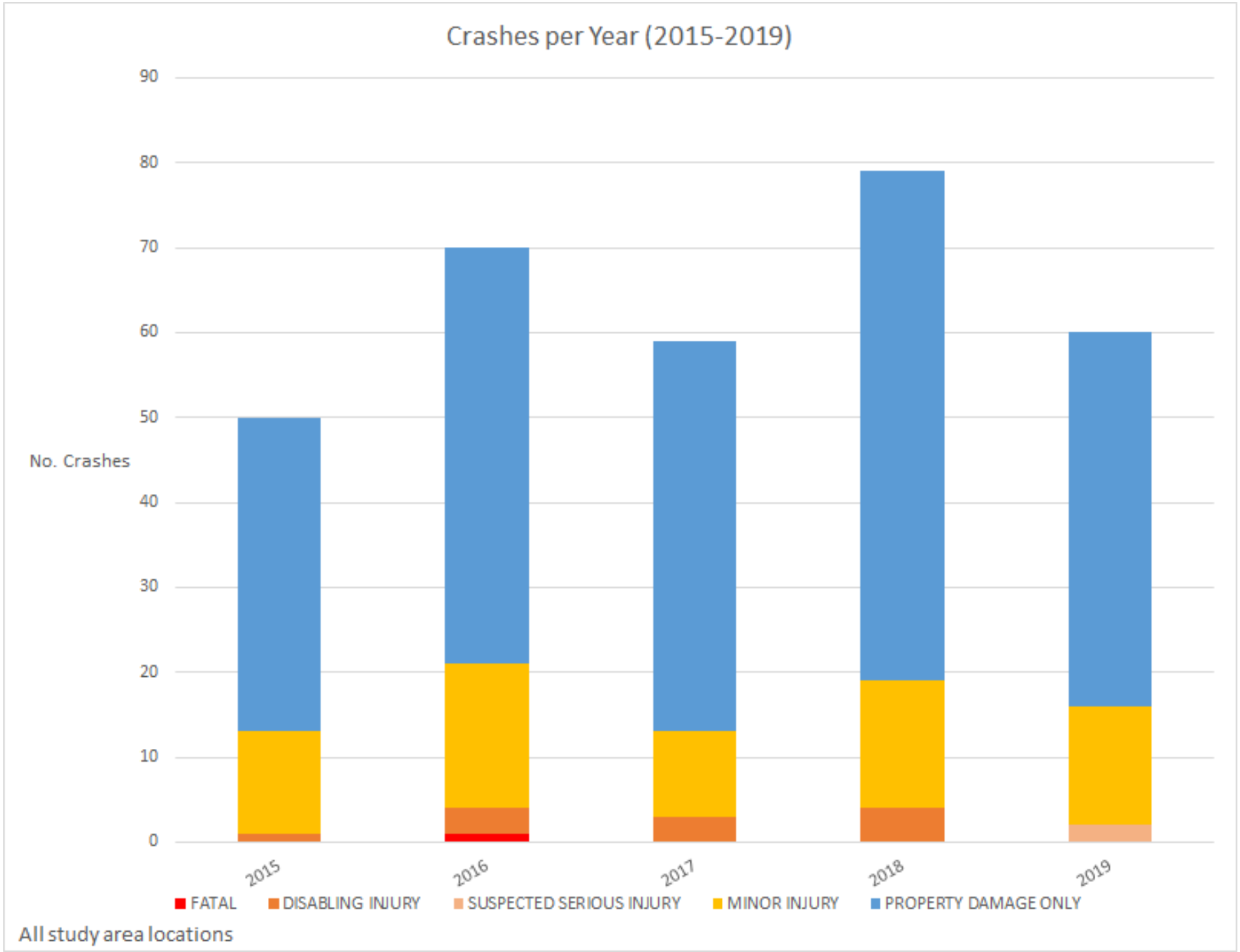
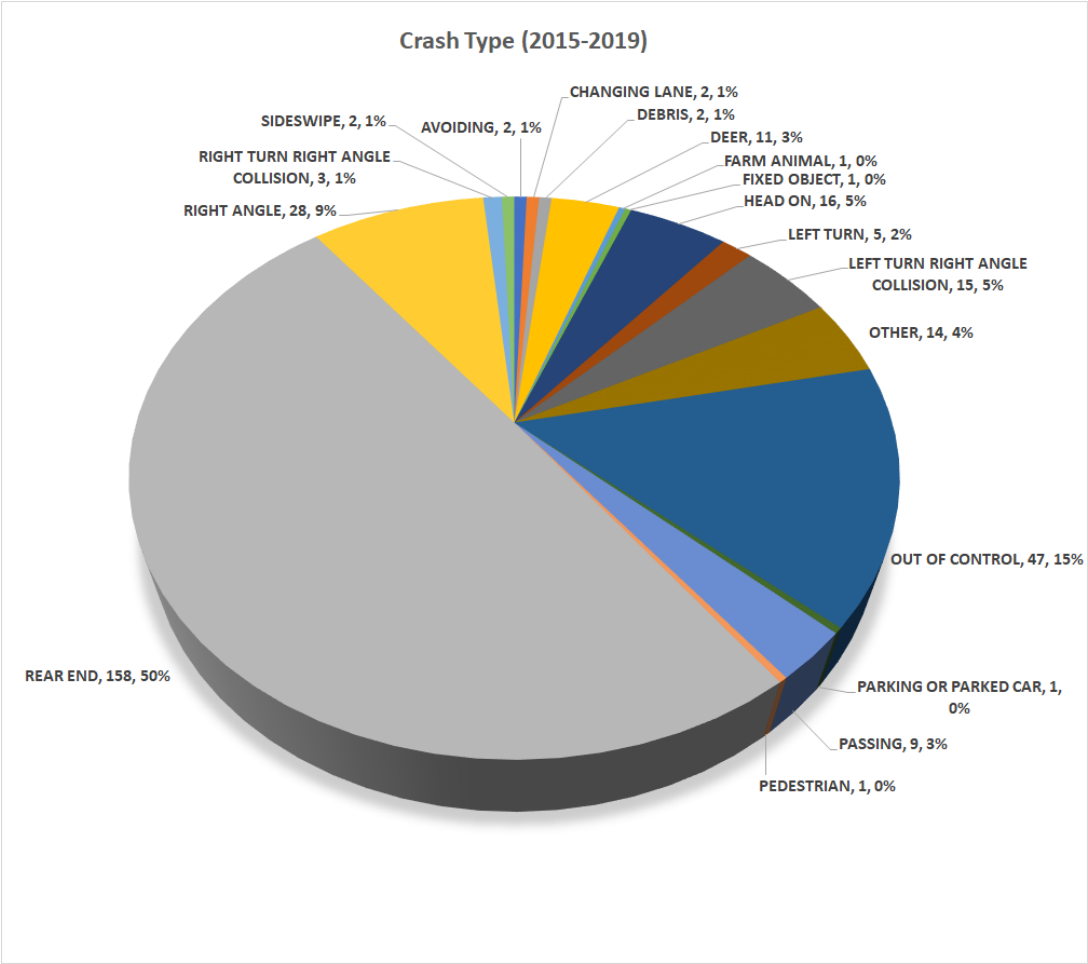
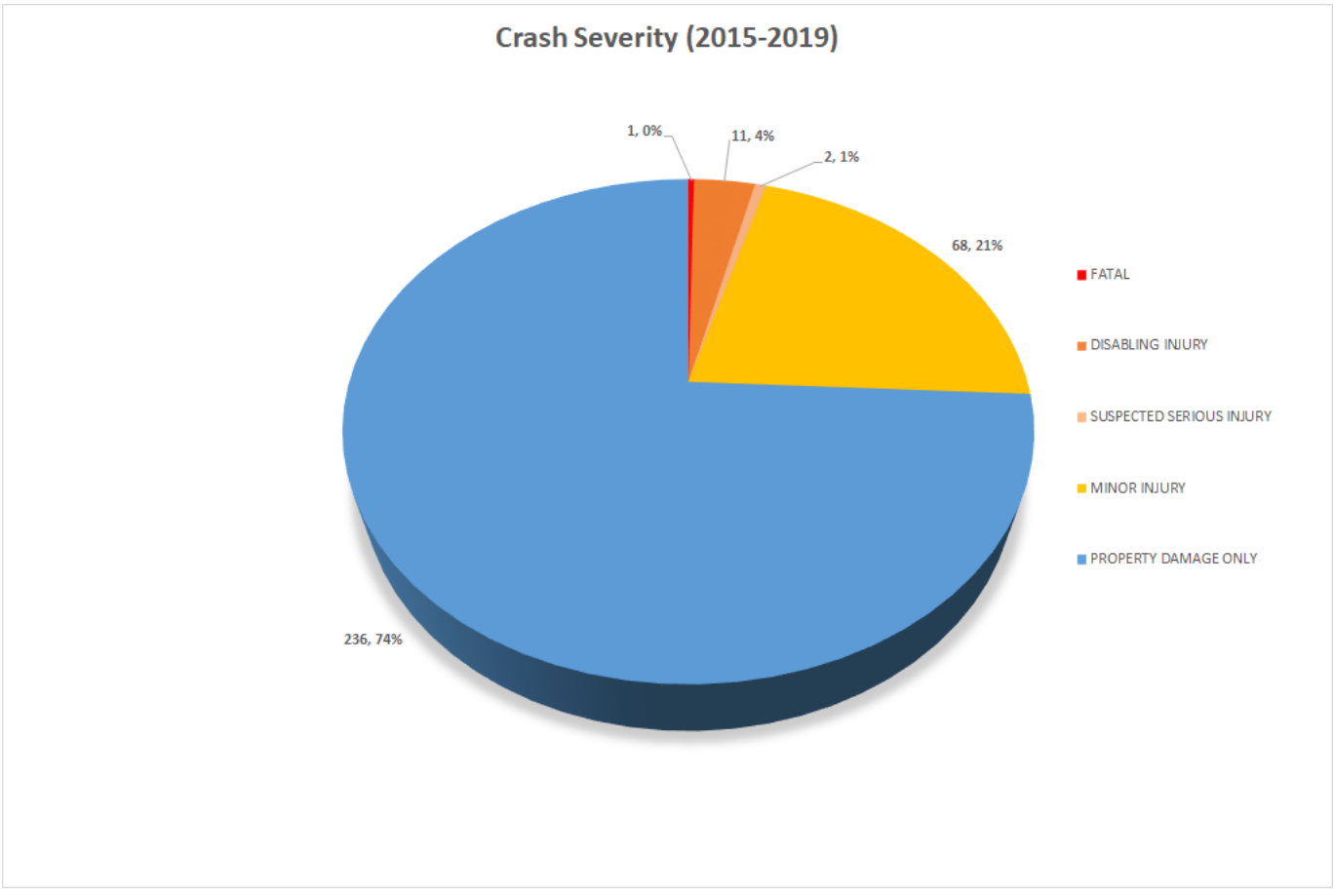
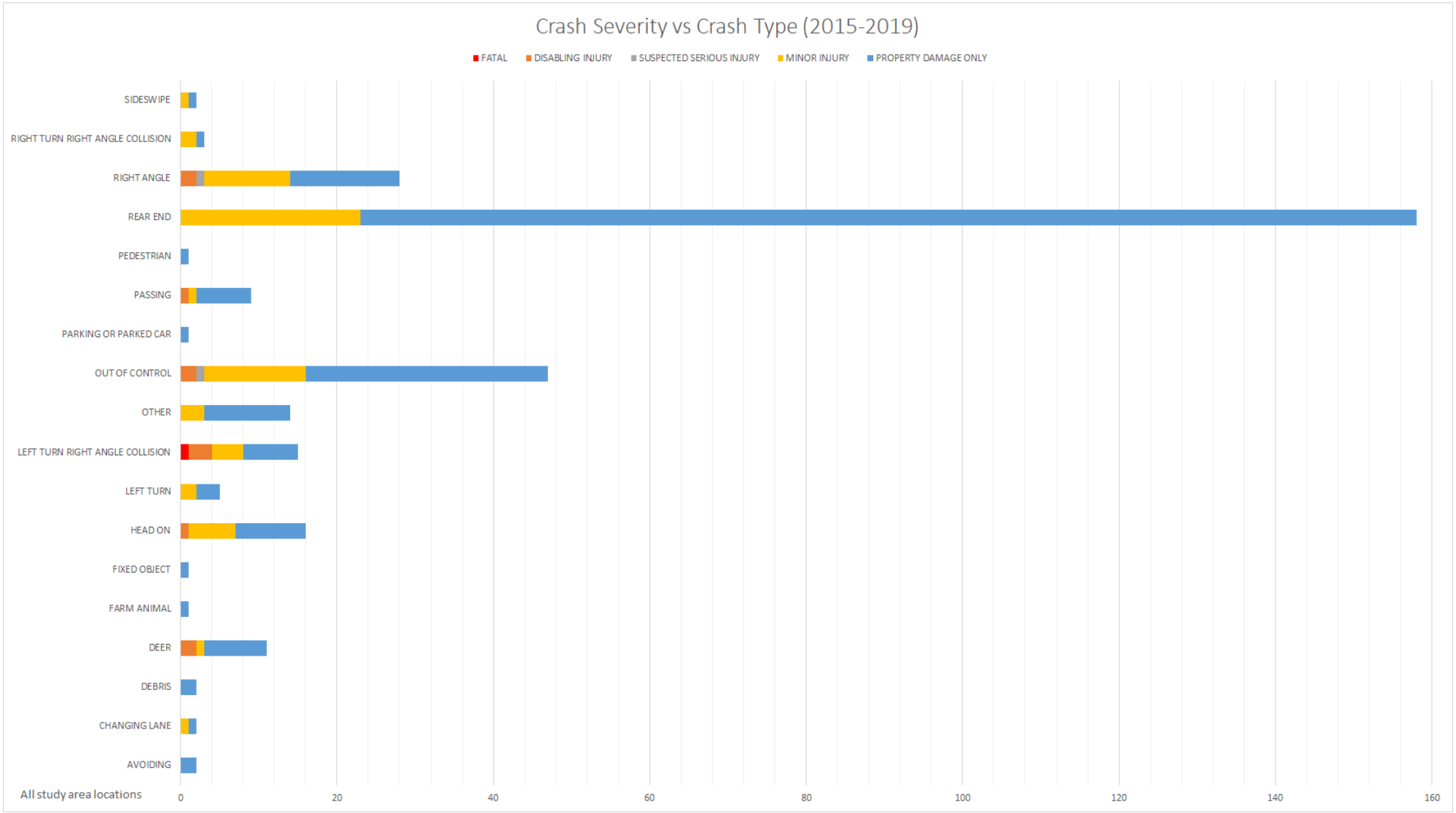
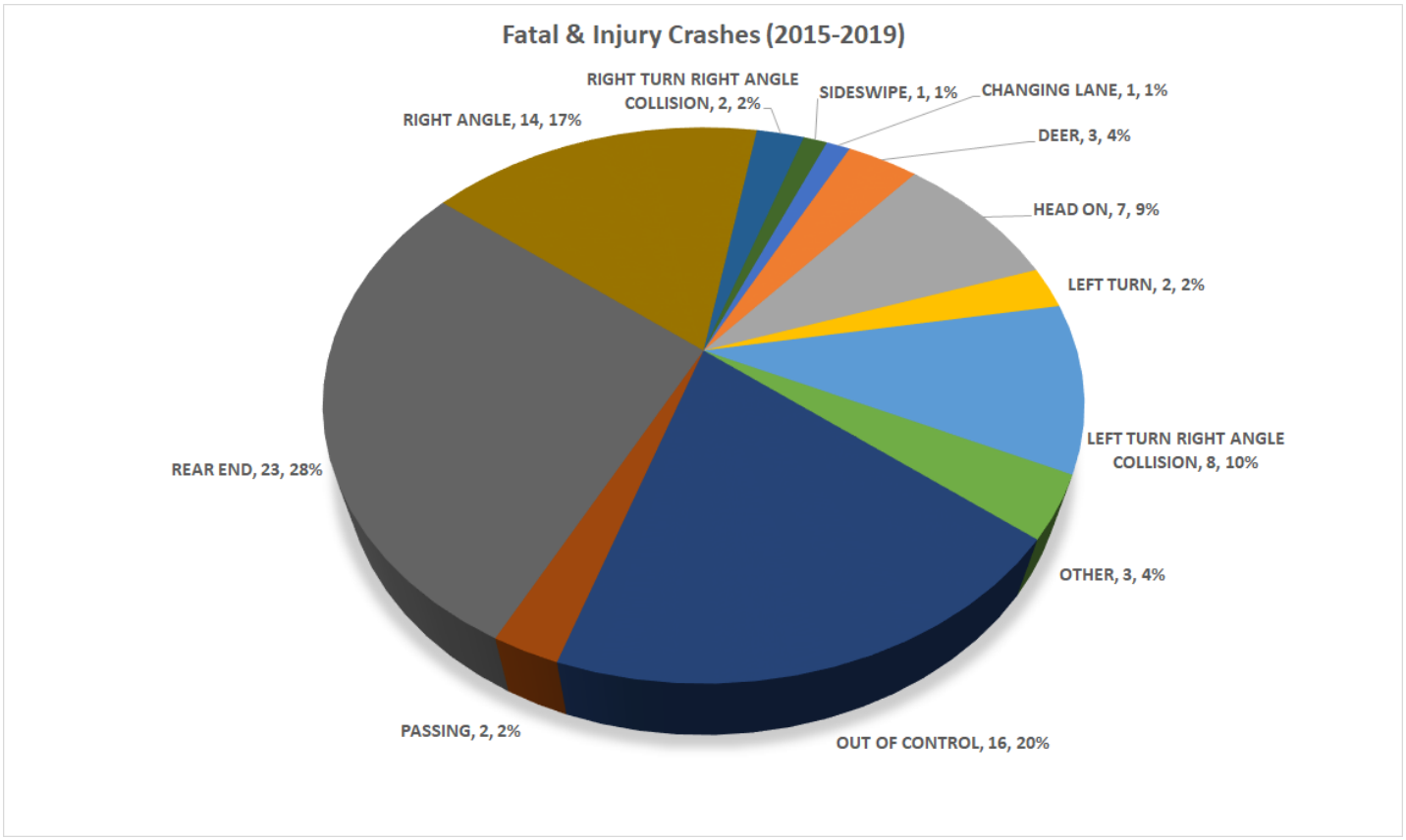
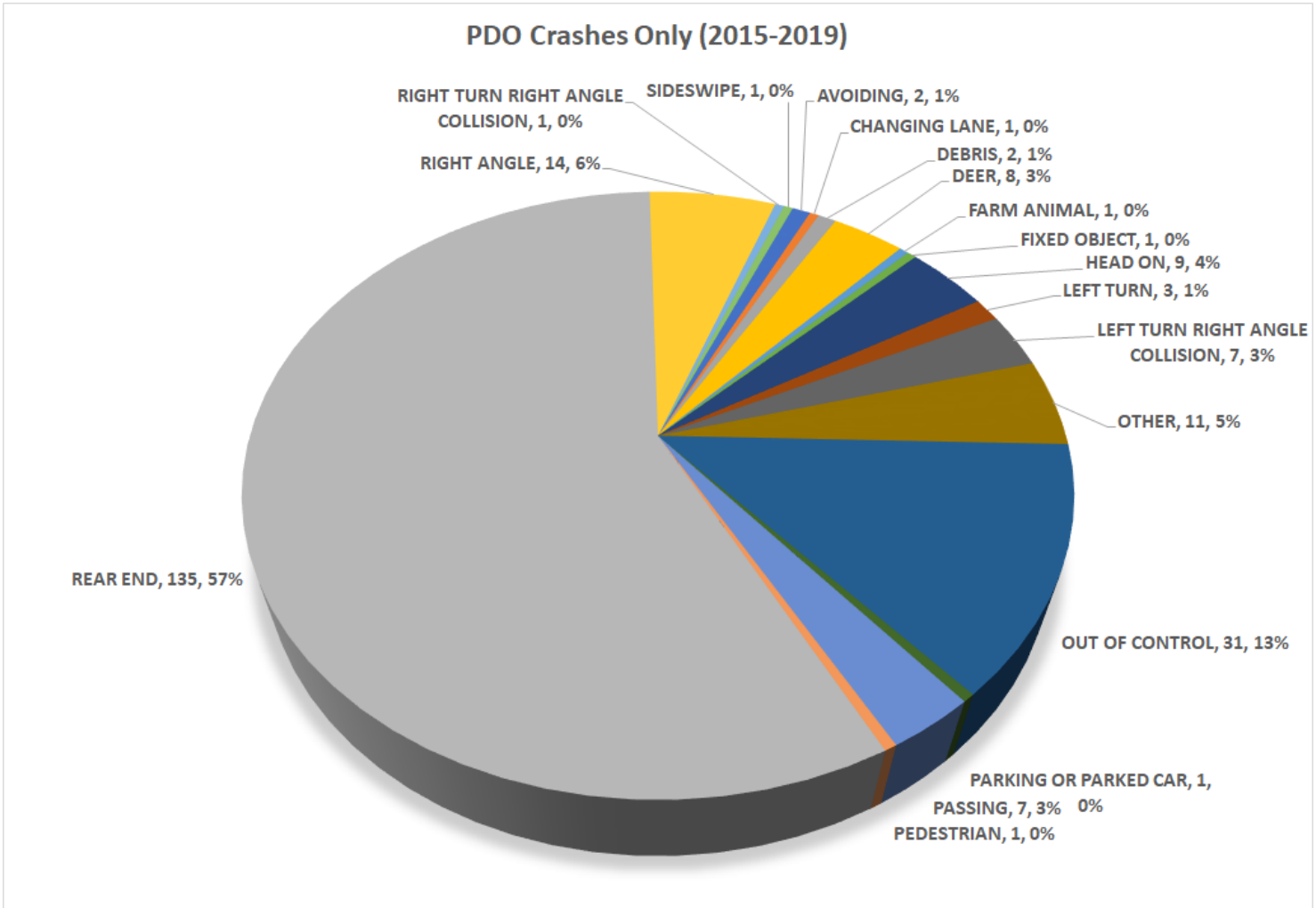

Crashes per Year (2015-2019)
No. Crashes
90
80
70
60
50
40
30
20
10
0
2015
2016
2017
2018
2019
FATAL
DISABLING INJURY
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY
All study area locations

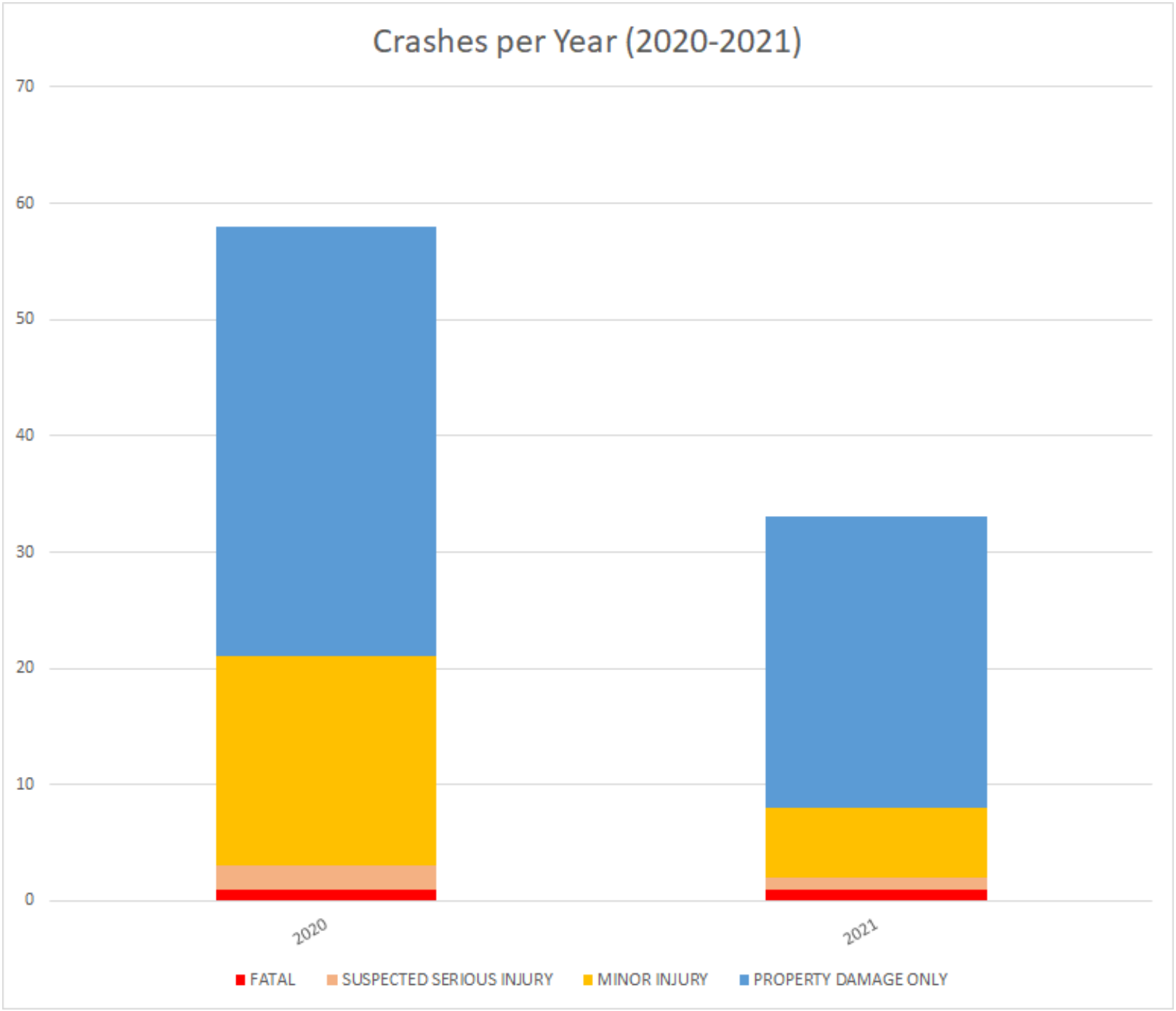

Crash Type (2015-2019)
CHANGING LANE, 2, 1%
DEBRIS, 2, 1%
DEER, 11, 3%
FARM ANIMAL, 1, 0%
FIXED OBJECT, 1, 0%
HEAD ON, 16, 5%
LEFT TURN, 5, 2%
LEFT TURN RIGHT ANGLE COLLISION, 15, 5%
OTHER, 14, 4%
OUT OF CONTROL, 47, 15%
PARKING OR PARKED CAR, 1, 0%
PASSING, 9, 3%
PEDESTRIAN, 1, 0%
REAR END, 158, 50%
RIGHT ANGLE, 28, 9%
RIGHT TURN RIGHT ANGLE COLLISION, 3, 1%
SIDESWIPE, 2, 1%
AVOIDING, 2, 1%

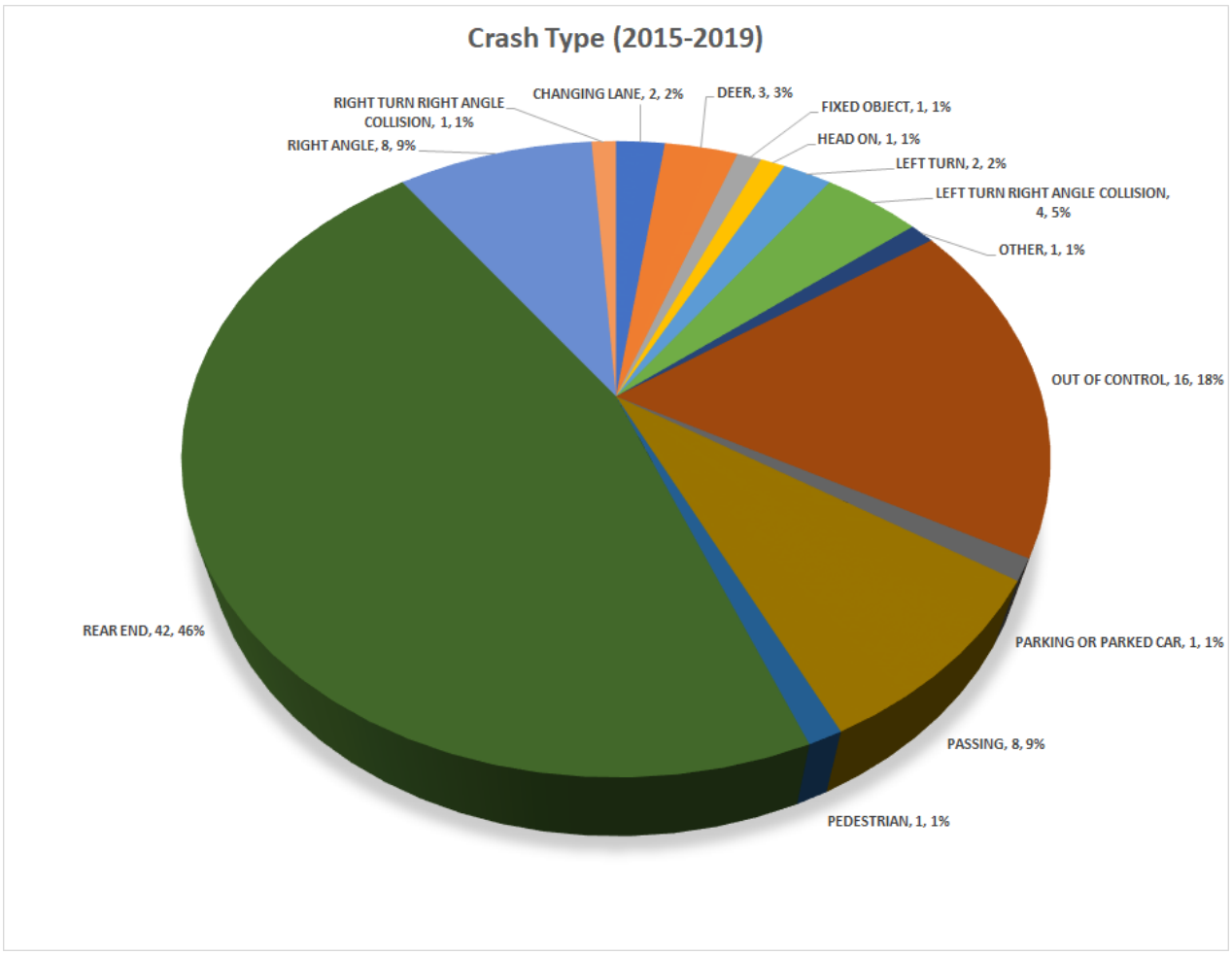

Crash Severity (2015-2019)
1, 0%
11, 4%
2, 1%
68, 21%
236, 74%
FATAL
DISABLING INJURY
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY

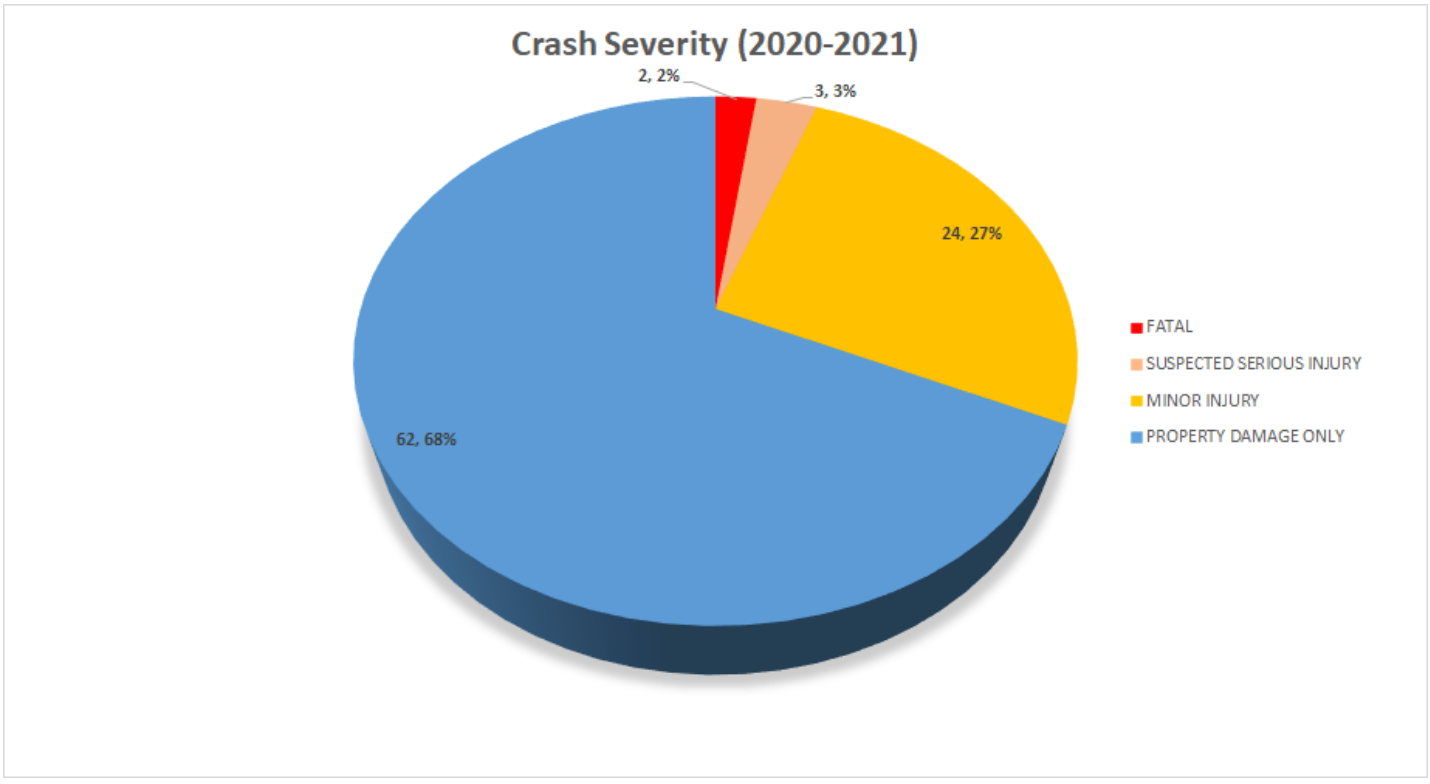

Crash Severity vs Crash Type (2015-2019)
FATAL
DISABLING INJURY
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY
SIDESWIPE
RIGHT TURN RIGHT ANGLE COLLISION
RIGHT ANGLE
REAR END
PEDESTRIAN
PASSING
PARKING OR PARKED CAR
OUT OF CONTROL
OTHER
LEFT TURN RIGHT ANGLE COLLISION
LEFT TURN
HEAD ON
FIXED OBJECT
FARM ANIMAL
DEER
DEBRIS
CHANGING LANE
AVOIDING
All study area locations
0
20
40
60
80
100
120
140
160

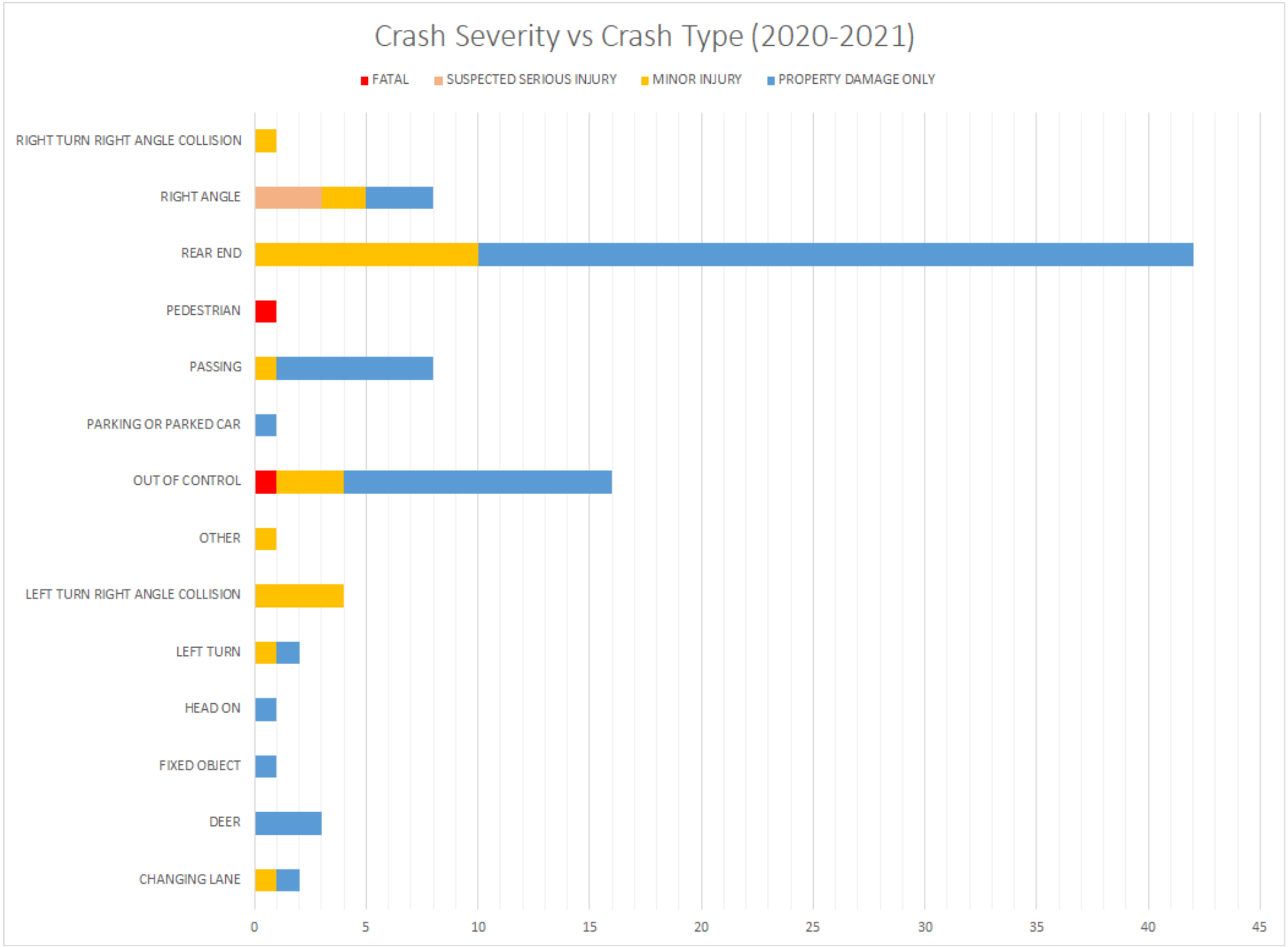

Fatal & Injury Crashes (2015-2019)
RIGHT TURN RIGHT ANGLE COLLISION, 2, 2%
SIDESWIPE, 1, 1%
CHANGING LANE, 1, 1%
RIGHT ANGLE, 14, 17%
DEER, 3, 4%
HEAD ON, 7, 9%
LEFT TURN, 2, 2%
LEFT TURN RIGHT ANGLE COLLISION, 8, 10%
REAR END, 23, 28%
OTHER, 3, 4%
PASSING, 2, 2%
OUT OF CONTROL, 16, 20%

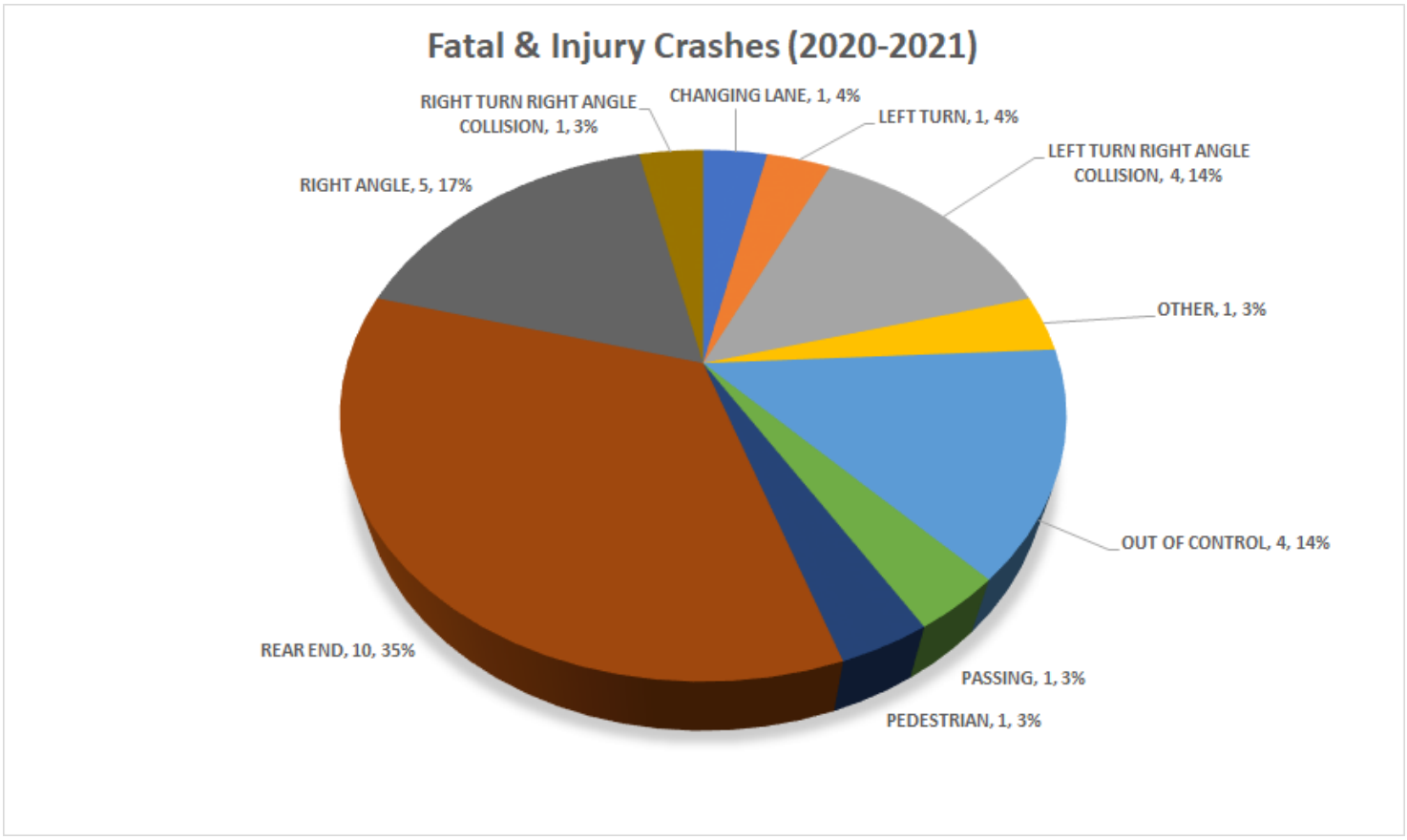

PDO Crashes Only (2015-2019)
RIGHT TURN RIGHT ANGLE COLLISION, 1, 0%
SIDESWIPE, 1, 0%
AVOIDING, 2, 1%
CHANGING LANE, 1, 0%
RIGHT ANGLE, 14, 6%
DEBRIS, 2, 1%
DEER, 8, 3%
FARM ANIMAL, 1, 0%
FIXED OBJECT, 1, 0%
HEAD ON, 9, 4%
LEFT TURN, 3, 1%
LEFT TURN RIGHT ANGLE COLLISION, 7, 3%
OTHER, 11, 5%
REAR END, 135, 57%
OUT OF CONTROL, 31, 13%
PARKING OR PARKED CAR, 1, 0%
PASSING, 7, 3%
PEDESTRIAN, 1, 0%

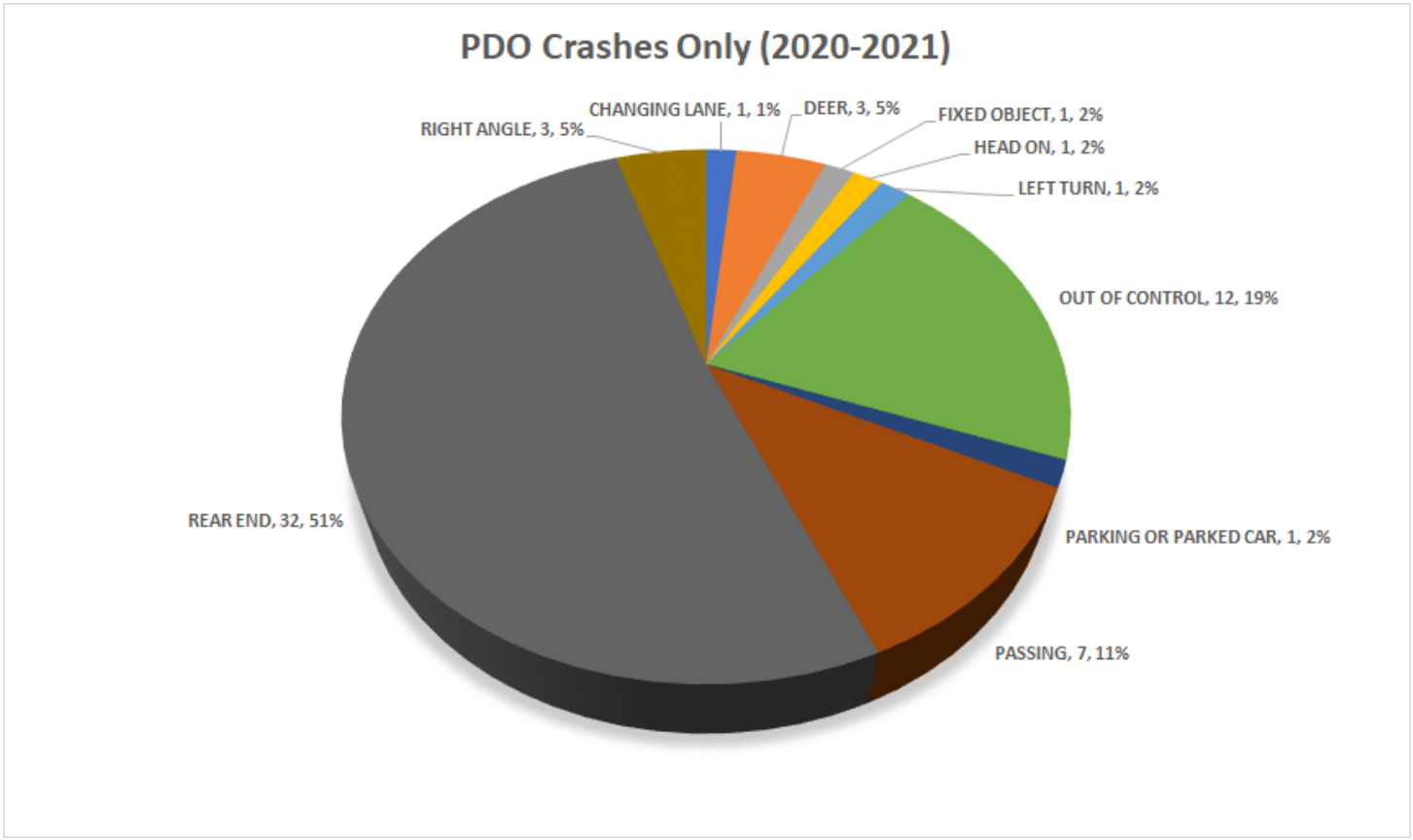

Crashes per Year (2020-2021)
70
60
50
40
30
20
10
0
2020
2021
FATAL
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY


Crash Type (2015-2019)
RIGHT TURN RIGHT ANGLE COLLISION, 1, 1%
CHANGING LANE, 2, 2%
DEER, 3, 3%
FIXED OBJECT, 1, 1%
HEAD ON, 1, 1%
LEFT TURN, 2, 2%
LEFT TURN RIGHT ANGLE COLLISION, 4, 5%
OTHER, 1, 1%
RIGHT ANGLE, 8, 9%
OUT OF CONTROL, 16, 18%
REAR END, 42, 46%
PARKING OR PARKED CAR, 1, 1%
PASSING, 8, 9%
PEDESTRIAN, 1, 1%


Crash Severity (2020-2021)
2, 2%
3, 3%
24, 27%
62, 68%
FATAL
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY


Crash Severity vs Crash Type (2020-2021)
FATAL
SUSPECTED SERIOUS INJURY
MINOR INJURY
PROPERTY DAMAGE ONLY
RIGHT TURN RIGHT ANGLE COLLISION
RIGHT ANGLE
REAR END
PEDESTRIAN
PASSING
PARKING OR PARKED CAR
OUT OF CONTROL
OTHER
LEFT TURN RIGHT ANGLE COLLISION
LEFT TURN
HEAD ON
FIXED OBJECT
DEER
CHANGING LANE
0
5
10
15
20
25
30
35
40
45


Fatal & Injury Crashes (2020-2021)
RIGHT TURN RIGHT ANGLE COLLISION, 1, 3%
CHANGING LANE, 1, 4%
LEFT TURN, 1, 4%
LEFT TURN RIGHT ANGLE COLLISION, 4, 14%
RIGHT ANGLE, 5, 17%
OTHER, 1, 3%
OUT OF CONTROL, 4, 14%
REAR END, 10, 35%
PASSING, 1, 3%
PEDESTRIAN, 1, 3%


PDO Crashes Only (2020-2021)
CHANGING LANE, 1, 1%
DEER, 3, 5%
FIXED OBJECT, 1, 2%
RIGHT ANGLE, 3, 5%
HEAD ON, 1, 2%
LEFT TURN, 1, 2%
OUT OF CONTROL, 12, 19%
REAR END, 32, 51%
PARKING OR PARKED CAR, 1, 2%
PASSING, 7, 11%

APPENDIX B

CAPACITY ANALYSIS

Existing

HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Existing AM
Project Description	James River Freeway EB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.85	0.917	808	4800	0.17	72.2	5.6	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.88	0.52	0.935	0.641	766	144	7200	2100	0.11	0.07	72.2	72.2	3.5	3.5	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.88	0.935	707	4800	0.15	72.2	4.9	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.88	0.90	0.877	0.847	1309	555	7200	2100	0.18	0.26	72.2	72.2	6.0	6.0	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.89	0.862	1310	4800	0.27	70.2	9.3	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.9	5.5	5.0	1.00	A

Facility Overall Results

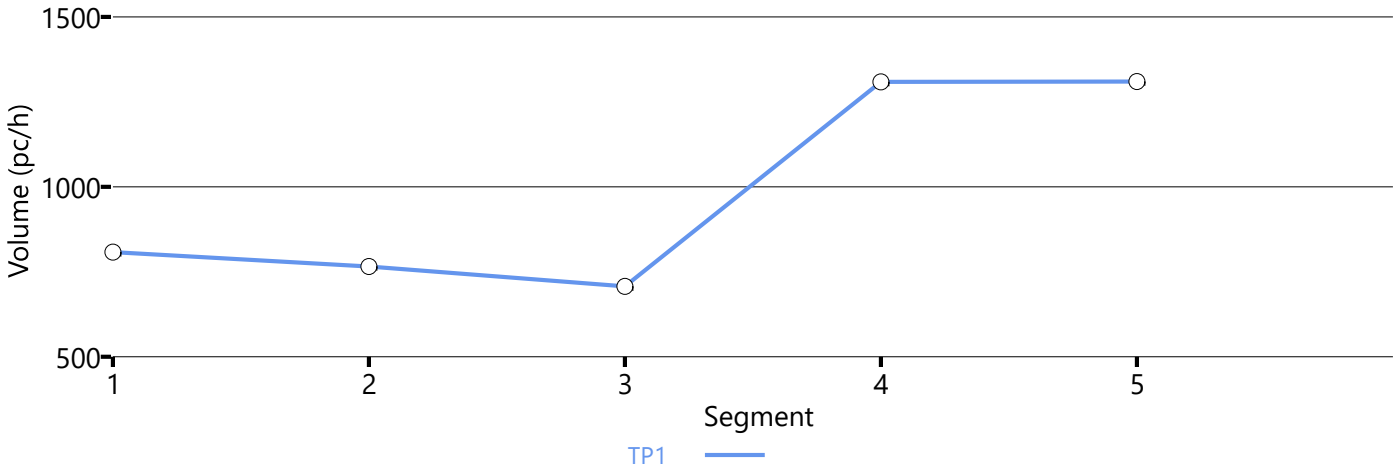
Space Mean Speed, mi/h	71.9	Density, veh/mi/ln	5.0
Average Travel Time, min	1.00	Density, pc/mi/ln	5.5

Messages

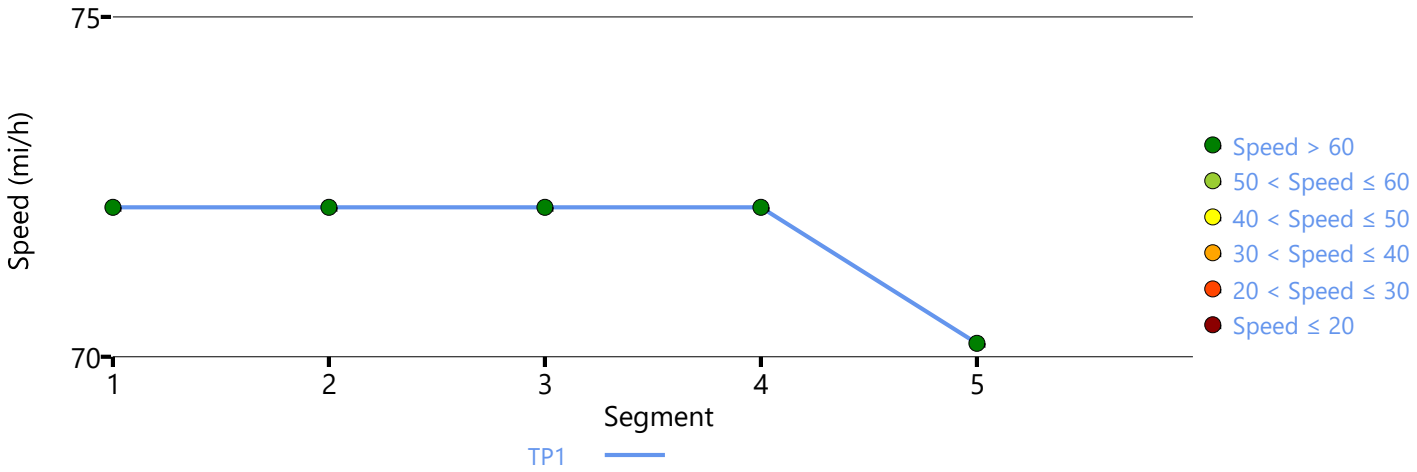
WARNING 1	PHFs are set to one for multiple time period analysis.

Comments

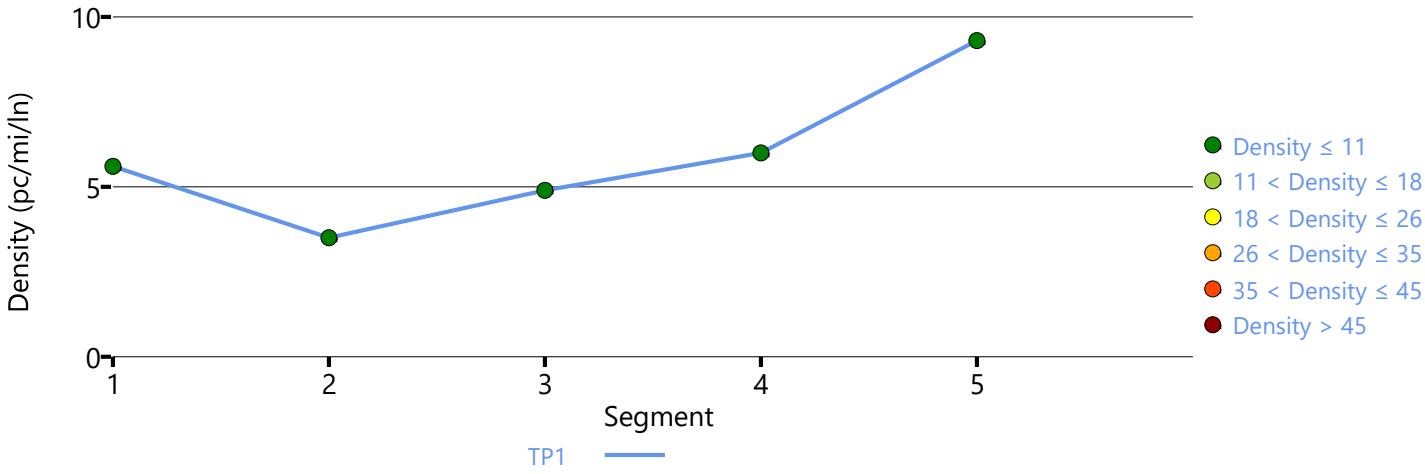
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Existing AM
Project Description	James River Freeway WB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.13		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	WB Diverge at MM	775	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.90	0.794	999	4800	0.21	72.2	6.9	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.89	0.91	0.781	0.820	1027	433	7200	2100	0.14	0.21	72.2	72.2	4.7	4.7	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.89	0.877	501	4800	0.10	72.2	3.5	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.89	0.64	0.877	0.602	587	86	7200	2100	0.08	0.04	72.2	72.2	2.7	2.7	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.89	0.758	629	4800	0.13	72.2	4.3	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	4.0	3.3	0.90	A

Facility Overall Results

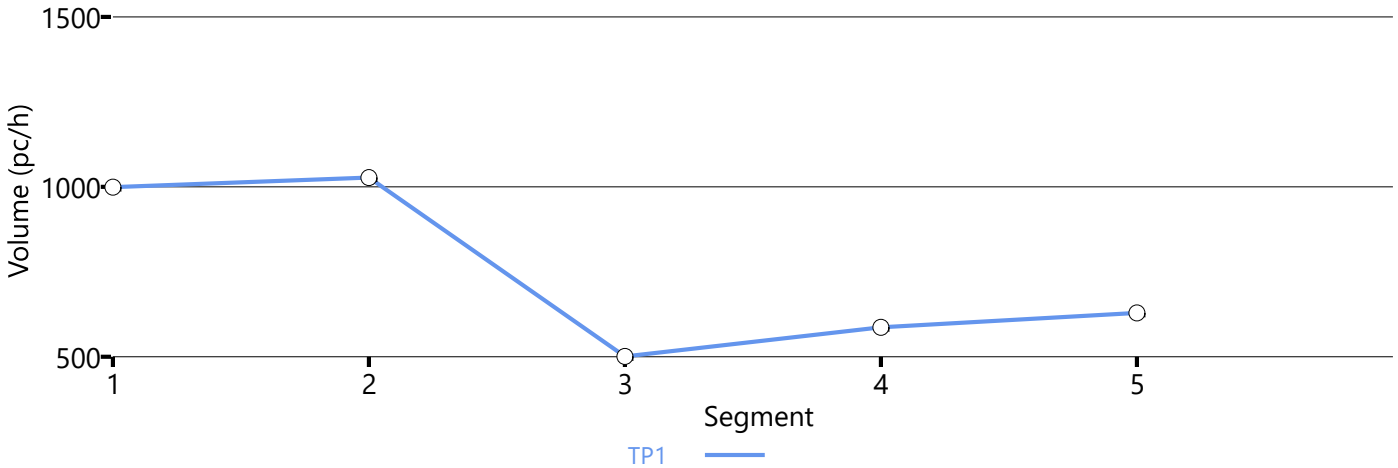
Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	3.3
Average Travel Time, min	0.90	Density, pc/mi/ln	4.0

Messages

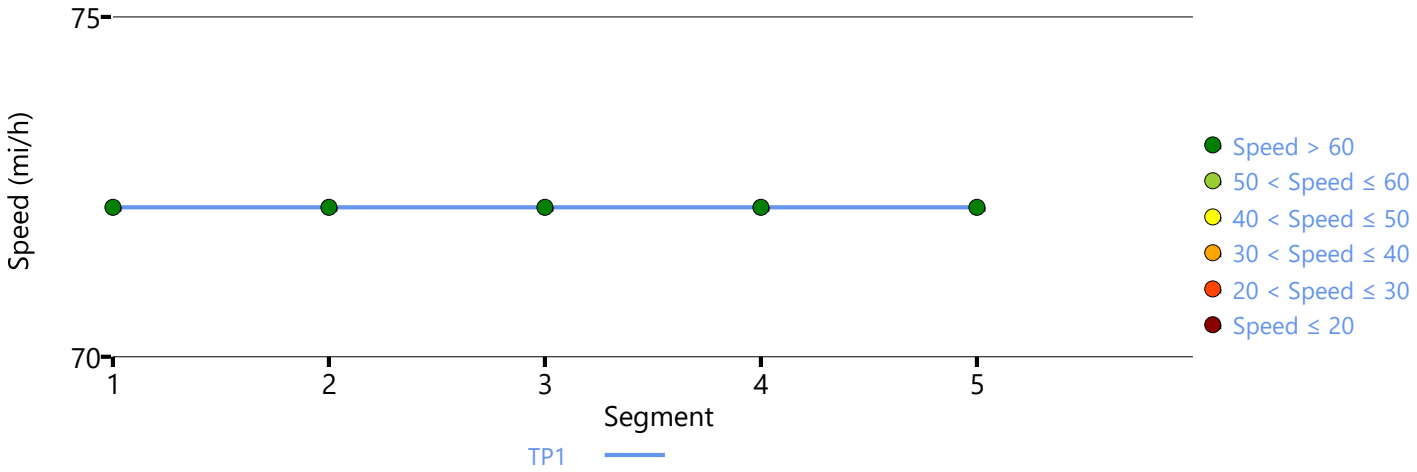
WARNING 1	PHFs are set to one for multiple time period analysis.

Comments

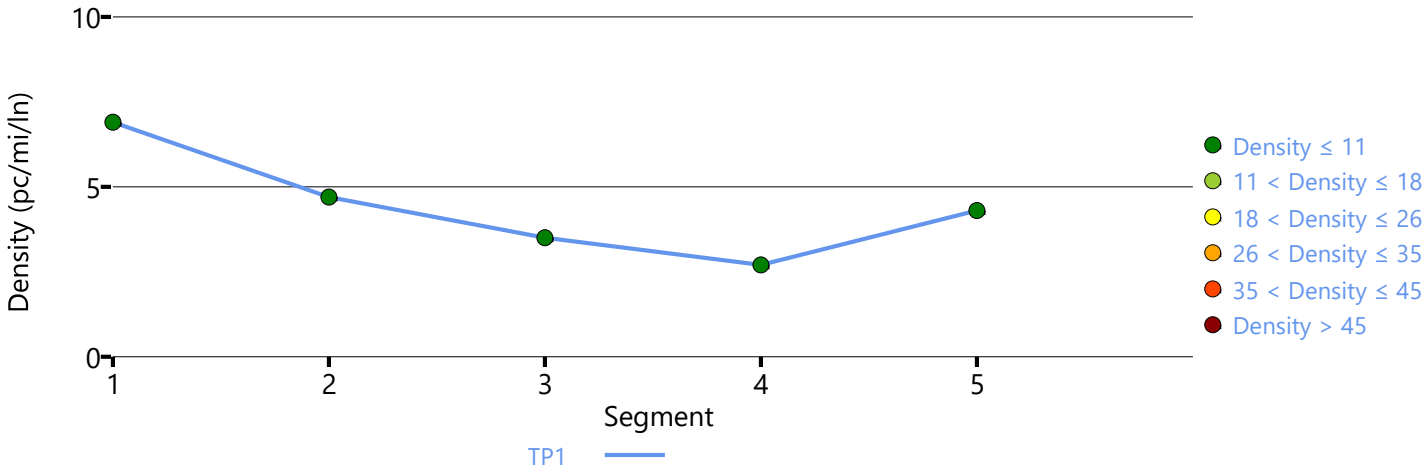
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Existing PM
Project Description	James River Freeway EB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.93	0.893	861	4800	0.18	72.2	6.0	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.67	0.909	0.641	855	154	7200	2100	0.12	0.07	72.2	72.2	3.9	3.9	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.909	776	4800	0.16	72.2	5.4	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.76	0.833	0.893	1482	635	7200	2100	0.21	0.30	72.2	72.2	6.8	6.8	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.85	0.847	1500	4800	0.31	72.2	10.4	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	6.1	5.3	0.90	A

Facility Overall Results

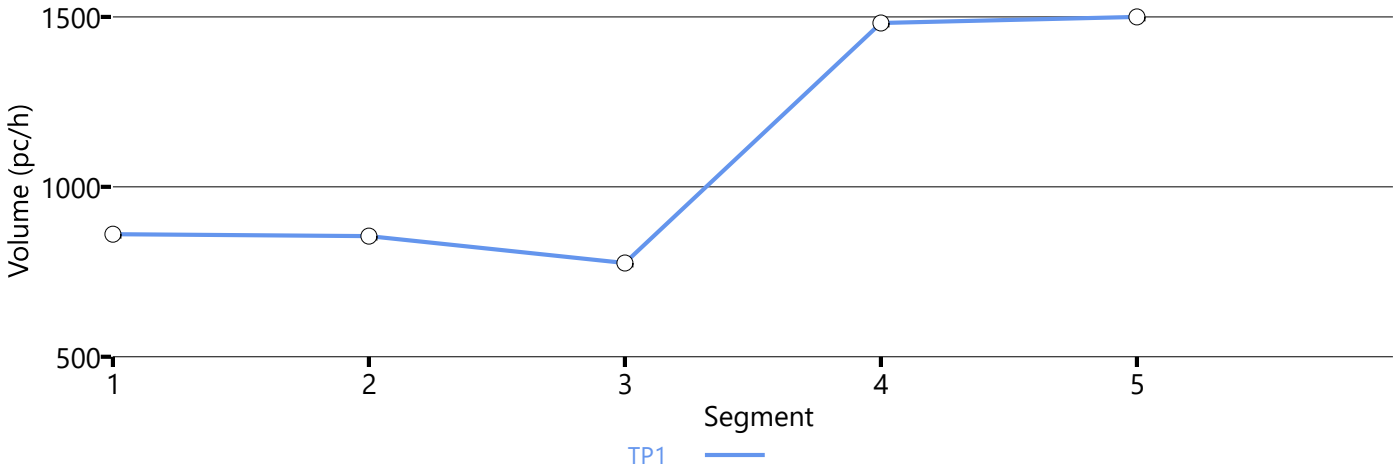
Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	5.3
Average Travel Time, min	0.90	Density, pc/mi/ln	6.1

Messages

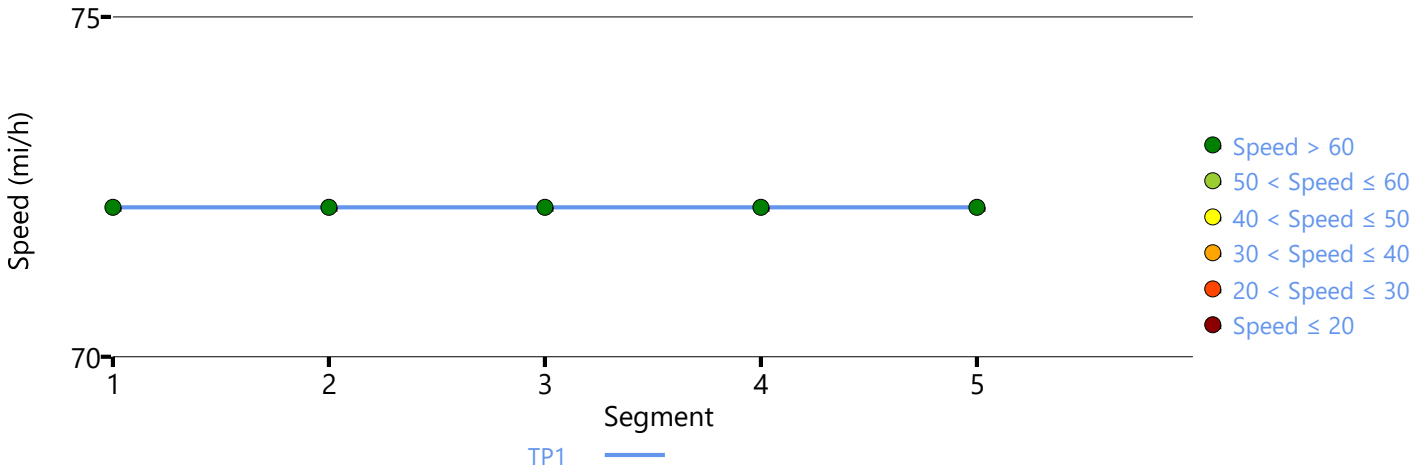
WARNING 1	PHFs are set to one for multiple time period analysis.

Comments

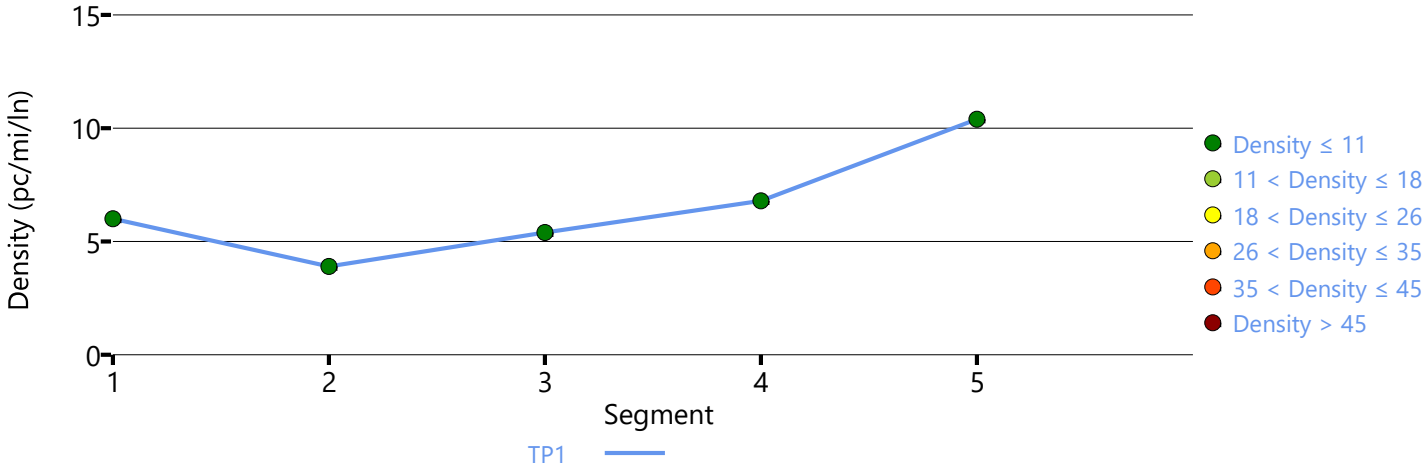
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Existing PM
Project Description	James River Freeway WB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.13		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	WB Diverge at MM	775	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.87	0.893	1536	4800	0.32	72.2	10.6	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.87	0.86	0.893	0.909	1536	573	7200	2100	0.21	0.27	72.2	72.2	7.1	7.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.87	0.943	908	4800	0.19	72.2	6.3	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.87	0.84	0.943	0.575	995	87	7200	2100	0.14	0.04	72.2	72.2	4.6	4.6	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.87	0.926	977	4800	0.20	73.3	6.6	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.3	6.6	6.0	0.90	A

Facility Overall Results

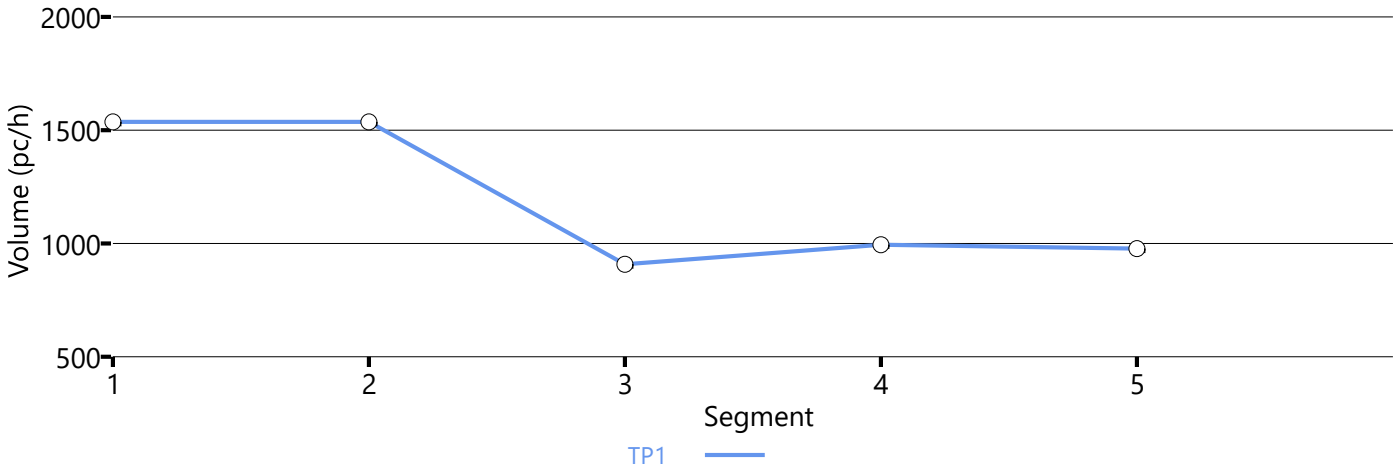
Space Mean Speed, mi/h	72.3	Density, veh/mi/ln	6.0
Average Travel Time, min	0.90	Density, pc/mi/ln	6.6

Messages

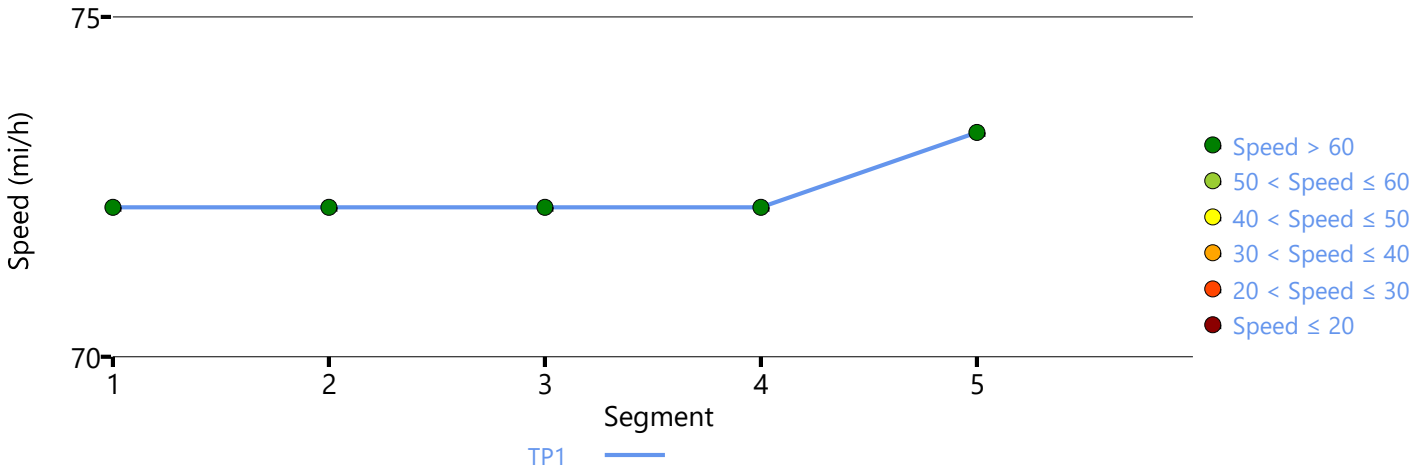
WARNING 1	PHFs are set to one for multiple time period analysis.

Comments

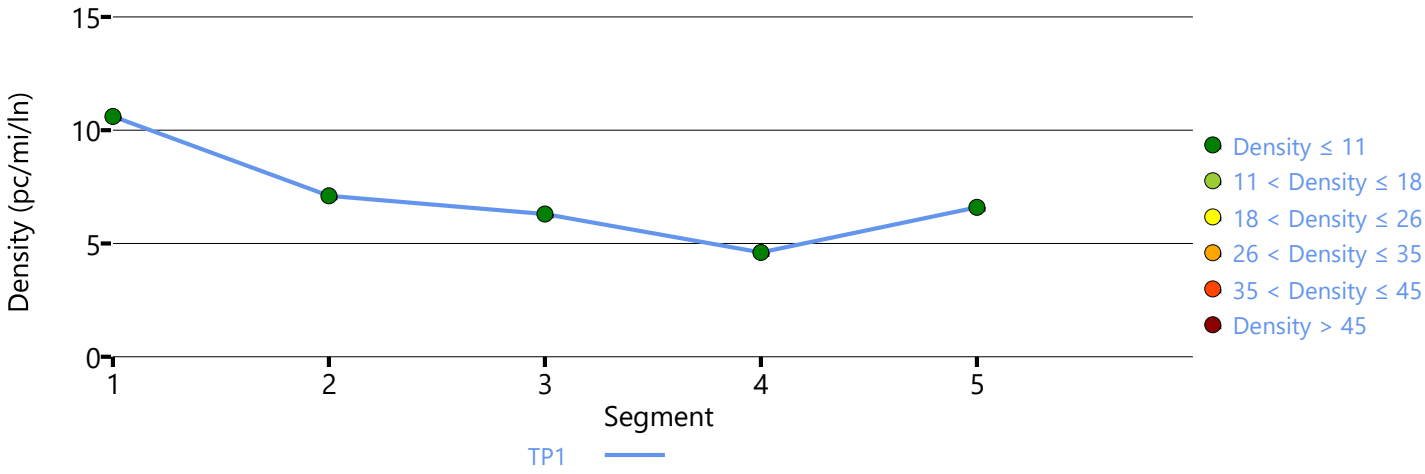
Volume Distribution



Speed Distribution



Density Distribution

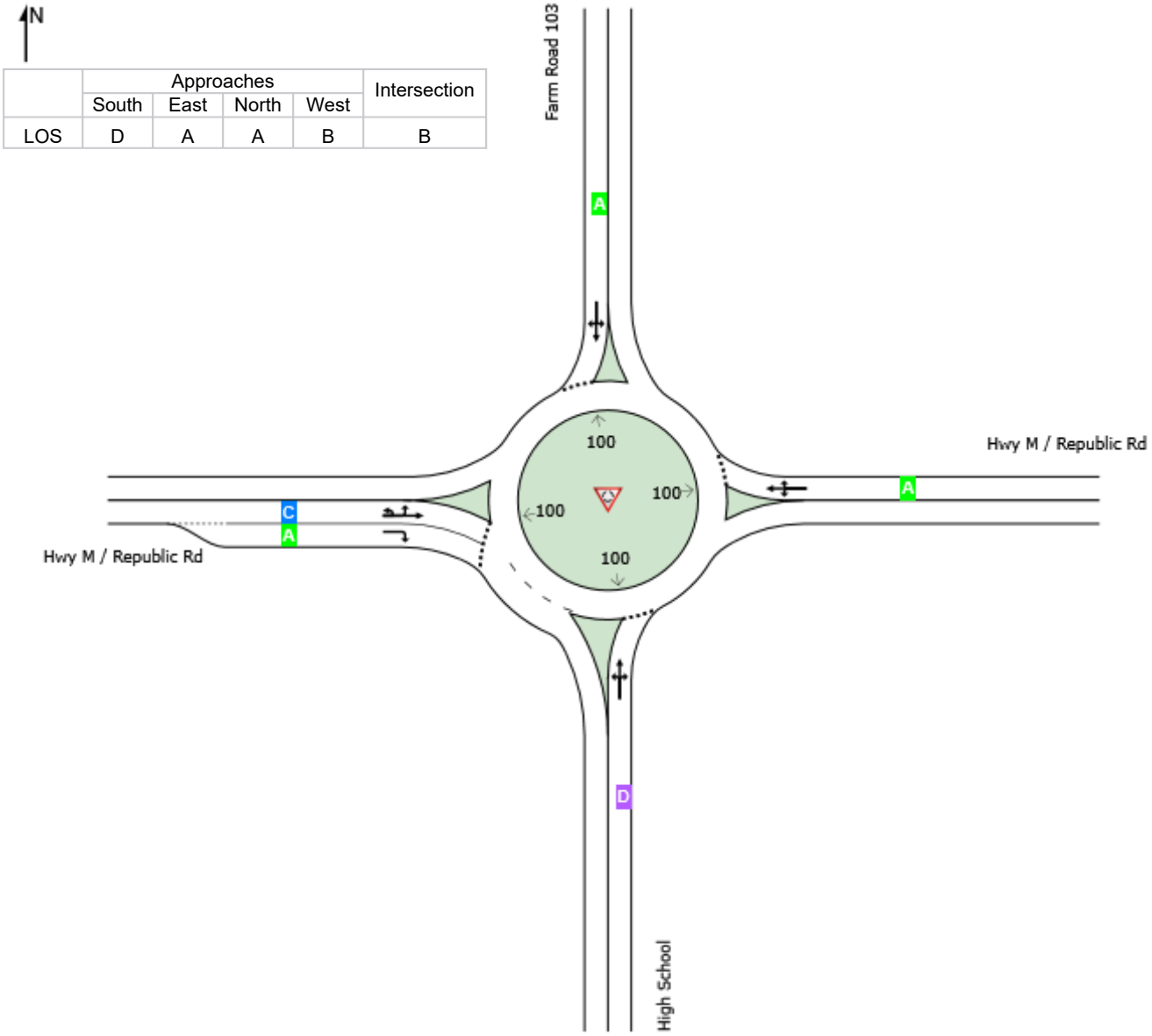


LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout



	Approaches				Intersection
	South	East	North	West	
LOS	D	A	A	B	B

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: High School													
Lane 1[d]	361	2.3	514	0.702	100	25.4	LOS D	5.4	138.3	Full	1600	0.0	0.0
Approach	361	2.3		0.702		25.4	LOS D	5.4	138.3				
East: Hwy M / Republic Rd													
Lane 1[d]	321	3.7	1006	0.319	100	6.8	LOS A	1.6	41.5	Full	1600	0.0	0.0
Approach	321	3.7		0.319		6.8	LOS A	1.6	41.5				
North: Farm Road 103													
Lane 1[d]	80	4.2	850	0.094	100	5.1	LOS A	0.4	9.7	Full	1600	0.0	0.0
Approach	80	4.2		0.094		5.1	LOS A	0.4	9.7				
West: Hwy M / Republic Rd													
Lane 1[d]	920	2.0	1191	0.773	100	16.3	LOS C	15.9	404.4	Full	1200	0.0	0.0
Lane 2	371	2.0	1191	0.312	100	5.9	LOS A	1.6	39.8	Short	365	0.0	NA
Approach	1291	2.0		0.773		13.3	LOS B	15.9	404.4				
Intersection	2053	2.4		0.773		14.1	LOS B	15.9	404.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: High School

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	95	20	246	361	2.3	514	0.702	100	NA	NA
Approach	95	20	246	361	2.3		0.702			

East: Hwy M / Republic Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	132	185	4	321	3.7	1006	0.319	100	NA	NA

Approach	132	185	4	321	3.7			0.319			
North: Farm Road 103											
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	28	44	80	4.2		850	0.094	100	NA	NA
Approach	8	28	44	80	4.2			0.094			
West: Hwy M / Republic Rd											
Mov. From W To Exit:	U W	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	144	768	-	920	2.0	1191	0.773	100	NA	NA
Lane 2	-	-	-	371	371	2.0	1191	0.312	100	0.0	1
Approach	8	144	768	371	1291	2.0		0.773			
	Total	%HV	Deg.Satn (v/c)								
Intersection	2053	2.4	0.773								

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: High School Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Hwy M / Republic Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Farm Road 103 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Hwy M / Republic Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

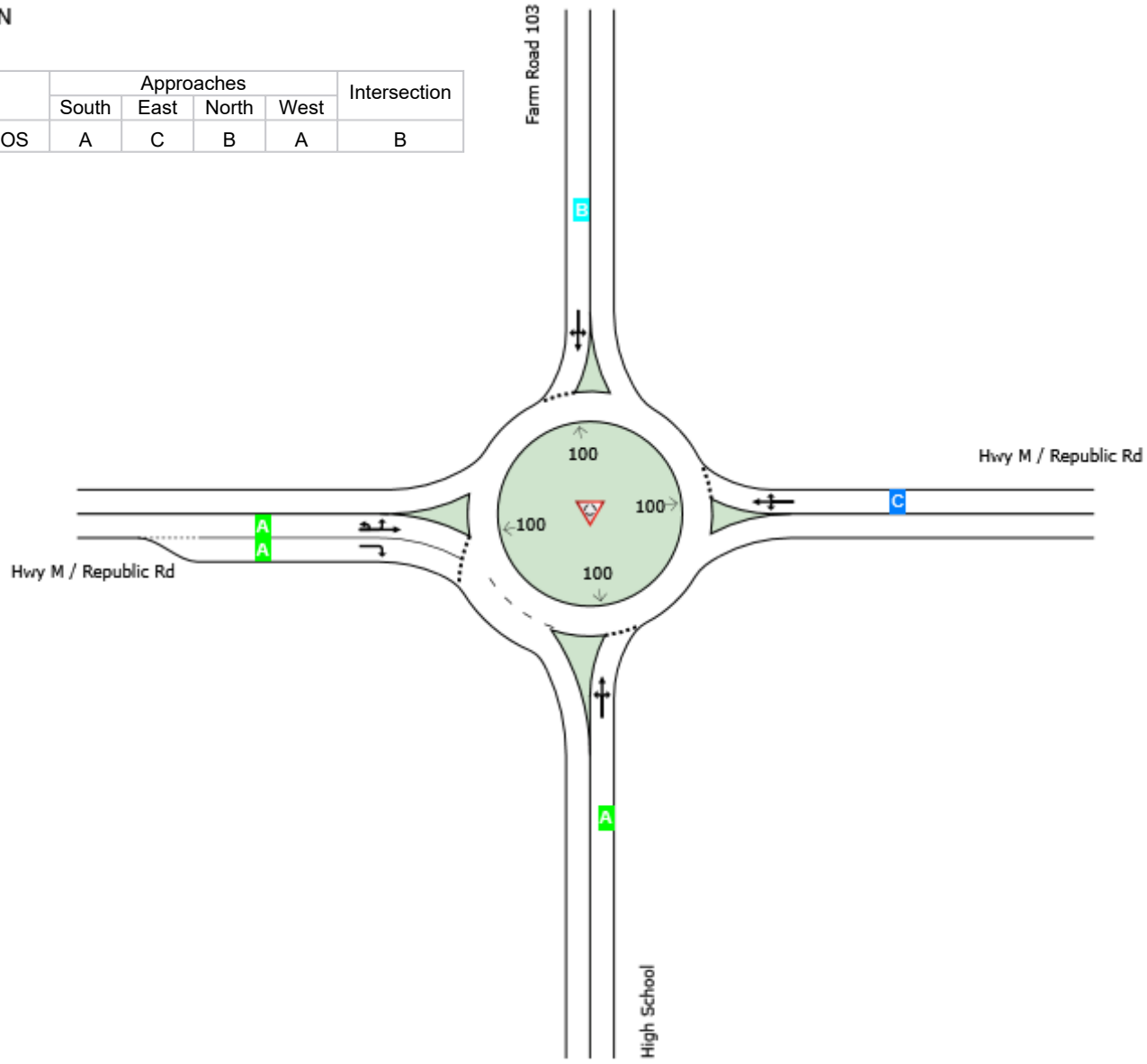
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	C	B	A	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: High School													
Lane 1[d]	297	2.0	933	0.319	100	7.2	LOS A	1.6	40.1	Full	1600	0.0	0.0
Approach	297	2.0		0.319		7.2	LOS A	1.6	40.1				
East: Hwy M / Republic Rd													
Lane 1[d]	751	2.0	1022	0.735	100	16.3	LOS C	13.3	338.2	Full	1600	0.0	0.0
Approach	751	2.0		0.735		16.3	LOS C	13.3	338.2				
North: Farm Road 103													
Lane 1[d]	209	2.0	519	0.402	100	13.5	LOS B	1.9	49.4	Full	1600	0.0	0.0
Approach	209	2.0		0.402		13.5	LOS B	1.9	49.4				
West: Hwy M / Republic Rd													
Lane 1[d]	337	2.0	1278	0.264	100	5.1	LOS A	1.3	32.9	Full	1200	0.0	0.0
Lane 2	80	2.0	1278	0.062	100	3.3	LOS A	0.2	6.3	Short	365	0.0	NA
Approach	417	2.0		0.264		4.8	LOS A	1.3	32.9				
Intersection	1674	2.0		0.735		11.5	LOS B	13.3	338.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: High School

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	178	28	91	297	2.0	933	0.319	100	NA	NA
Approach	178	28	91	297	2.0		0.319			

East: Hwy M / Republic Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	56	683	12	751	2.0	1022	0.735	100	NA	NA

Approach	56	683	12	751	2.0			0.735			
North: Farm Road 103											
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	20	16	173	209	2.0		519	0.402	100	NA	NA
Approach	20	16	173	209	2.0			0.402			
West: Hwy M / Republic Rd											
Mov. From W To Exit:	U W	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	4	60	273	-	337	2.0	1278	0.264	100	NA	NA
Lane 2	-	-	-	80	80	2.0	1278	0.062	100	0.0	1
Approach	4	60	273	80	417	2.0		0.264			
	Total	%HV	Deg.Satn (v/c)								
Intersection	1674	2.0	0.735								

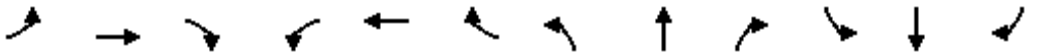
Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: High School Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Hwy M / Republic Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Farm Road 103 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Hwy M / Republic Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	25	16	74	64	49	681	31	16	318	109
v/c Ratio	0.20	0.12	0.05	0.26	0.31	0.08	0.63	0.03	0.04	0.34	0.13
Control Delay	35.0	47.3	0.3	34.7	28.8	8.3	19.8	0.0	8.1	17.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	47.3	0.3	34.7	28.8	8.3	19.8	0.0	8.1	17.1	0.3
Queue Length 50th (ft)	13	11	0	24	11	11	253	0	4	130	0
Queue Length 95th (ft)	53	21	0	45	32	14	378	0	7	169	0
Internal Link Dist (ft)		485			2182		548			2133	
Turn Bay Length (ft)	150		85	175		250		240	200		240
Base Capacity (vph)	216	230	339	292	217	660	1428	1320	395	1318	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.11	0.05	0.25	0.29	0.07	0.48	0.02	0.04	0.24	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	10	11	34	15	23	26	511	22	9	251	74
Future Volume (vph)	33	10	11	34	15	23	26	511	22	9	251	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1357	1863	1455	1687	1480		1703	1759	1583	1583	1624	1357
Flt Permitted	0.72	1.00	1.00	1.00	1.00		0.54	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	1022	1863	1455	1776	1480		967	1759	1583	391	1624	1357
Peak-hour factor, PHF	0.79	0.40	0.67	0.46	0.60	0.59	0.53	0.75	0.70	0.58	0.79	0.68
Adj. Flow (vph)	42	25	16	74	25	39	49	681	31	16	318	109
RTOR Reduction (vph)	0	0	15	0	36	0	0	0	15	0	0	56
Lane Group Flow (vph)	42	25	1	74	28	0	49	681	16	16	318	53
Heavy Vehicles (%)	33%	2%	11%	7%	2%	26%	6%	8%	2%	14%	17%	19%
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8			6		2	2		6
Actuated Green, G (s)	9.6	3.6	3.6	9.6	5.9		45.9	44.0	44.0	45.9	42.2	42.2
Effective Green, g (s)	9.6	3.6	3.6	9.6	5.9		45.9	44.0	44.0	45.9	42.2	42.2
Actuated g/C Ratio	0.11	0.04	0.04	0.11	0.07		0.53	0.51	0.51	0.53	0.49	0.49
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	127	77	60	190	100		542	890	801	232	788	658
v/s Ratio Prot	0.01	0.01		c0.03	0.02		c0.00	c0.39		0.00	0.20	
v/s Ratio Perm	c0.02		0.00	0.02			0.04		0.01	0.03		0.04
v/c Ratio	0.33	0.32	0.01	0.39	0.28		0.09	0.77	0.02	0.07	0.40	0.08
Uniform Delay, d1	35.5	40.5	39.9	36.0	38.5		10.0	17.3	10.7	11.8	14.3	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	2.9	0.1	1.6	1.8		0.1	4.2	0.0	0.1	0.5	0.1
Delay (s)	37.3	43.4	40.0	37.5	40.3		10.1	21.5	10.7	12.0	14.8	12.0
Level of Service	D	D	D	D	D		B	C	B	B	B	B
Approach Delay (s)		39.6			38.8			20.3			14.0	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	31.4
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	2	42	0	0	0	0	509	57	364	292	0
Future Vol, veh/h	4	2	42	0	0	0	0	509	57	364	292	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	25	-	-	-	-	-	-	-	270	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	25	67	100	100	100	100	74	88	83	72	100
Heavy Vehicles, %	2	2	34	2	2	2	2	10	15	6	11	2
Mvmt Flow	5	8	63	0	0	0	0	688	65	439	406	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1972	1972	406	-	0	0	688	0	0
Stage 1	1284	1284	-	-	-	-	-	-	-
Stage 2	688	688	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.54	-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.606	-	-	-	2.254	-	-
Pot Cap-1 Maneuver	69	62	581	0	-	-	888	-	0
Stage 1	260	235	-	0	-	-	-	-	0
Stage 2	499	447	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	35	0	581	-	-	-	888	-	-
Mov Cap-2 Maneuver	-15166	0	-	-	-	-	-	-	-
Stage 1	260	0	-	-	-	-	-	-	-
Stage 2	252	0	-	-	-	-	-	-	-

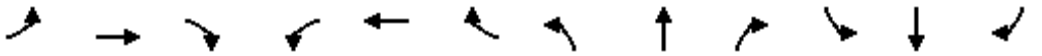
Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	+	705	888	-
HCM Lane V/C Ratio	-	-	-	0.1	0.494	-
HCM Control Delay (s)	-	-	4.8	10.7	12.9	-
HCM Lane LOS	-	-	A	B	B	-
HCM 95th %tile Q(veh)	-	-	-	0.3	2.8	-

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

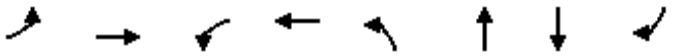
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	152	315	38	662	647	6
v/c Ratio	0.53	0.59	0.15	0.65	0.77	0.01
Control Delay	40.3	9.7	7.2	12.5	24.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	9.7	7.2	12.5	24.0	0.0
Queue Length 50th (ft)	70	0	6	169	266	0
Queue Length 95th (ft)	102	24	15	190	400	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	250		250			50
Base Capacity (vph)	400	618	293	1632	1429	1298
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.51	0.13	0.41	0.45	0.00

Intersection Summary



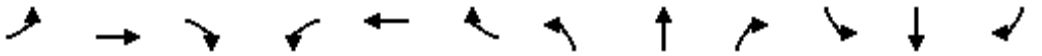
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	93	0	230	30	483	0	0	563	3
Future Volume (vph)	0	0	0	93	0	230	30	483	0	0	563	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		1.00	1.00	1.00			1.00	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1612		1538	1195	1776			1776	1583
Flt Permitted				0.95		1.00	0.24	1.00			1.00	1.00
Satd. Flow (perm)				1612		1538	297	1776			1776	1583
Peak-hour factor, PHF	1.00	1.00	1.00	0.61	1.00	0.73	0.80	0.73	1.00	1.00	0.87	0.50
Adj. Flow (vph)	0	0	0	152	0	315	38	662	0	0	647	6
RTOR Reduction (vph)	0	0	0	0	0	260	0	0	0	0	0	3
Lane Group Flow (vph)	0	0	0	152	0	55	38	662	0	0	647	3
Heavy Vehicles (%)	2%	2%	2%	12%	2%	5%	51%	7%	2%	2%	7%	2%
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				12.9		12.9	37.6	45.1			33.9	33.9
Effective Green, g (s)				12.9		12.9	37.6	45.1			33.9	33.9
Actuated g/C Ratio				0.18		0.18	0.51	0.61			0.46	0.46
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				282		269	196	1086			816	728
v/s Ratio Prot				c0.09			0.01	c0.37			c0.36	
v/s Ratio Perm						0.04	0.09					0.00
v/c Ratio				0.54		0.20	0.19	0.61			0.79	0.00
Uniform Delay, d1				27.7		26.0	10.7	8.9			16.9	10.8
Progression Factor				1.00		1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				2.2		0.4	0.6	1.1			5.6	0.0
Delay (s)				29.9		26.5	11.3	10.0			22.5	10.8
Level of Service				C		C	B	A			C	B
Approach Delay (s)		0.0			27.6			10.1			22.4	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	23.2
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	20	31	12	15	66	724	245	40
v/c Ratio	0.07	0.04	0.04	0.03	0.08	0.48	0.24	0.04
Control Delay	24.9	0.1	25.0	0.1	5.6	7.3	12.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	0.1	25.0	0.1	5.6	7.3	12.0	0.1
Queue Length 50th (ft)	3	0	2	0	1	0	32	0
Queue Length 95th (ft)	18	0	5	0	29	295	136	0
Internal Link Dist (ft)		347		749		490	984	
Turn Bay Length (ft)			30		200			240
Base Capacity (vph)	301	824	303	532	823	1620	1459	1464
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.04	0.04	0.03	0.08	0.45	0.17	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	18	3	0	11	53	542	4	0	201	32
Future Volume (vph)	12	0	18	3	0	11	53	542	4	0	201	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	1773			1597	1583
Flt Permitted	1.00	1.00		1.00	1.00		0.61	1.00			1.00	1.00
Satd. Flow (perm)	1863	1583		1863	1583		1130	1773			1597	1583
Peak-hour factor, PHF	0.59	0.59	0.59	0.25	0.80	0.75	0.80	0.76	0.38	0.92	0.82	0.80
Adj. Flow (vph)	20	0	31	12	0	15	66	713	11	0	245	40
RTOR Reduction (vph)	0	30	0	0	15	0	0	0	0	0	0	22
Lane Group Flow (vph)	20	1	0	12	0	0	66	724	0	0	245	18
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	19%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	2.7	1.9		2.7	0.8		33.9	41.4			29.9	29.9
Effective Green, g (s)	2.7	1.9		2.7	0.8		33.9	41.4			29.9	29.9
Actuated g/C Ratio	0.04	0.03		0.04	0.01		0.50	0.61			0.44	0.44
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)	71	44		72	18		600	1079			702	696
v/s Ratio Prot	c0.01	0.00		0.00	0.00		0.01	c0.41			0.15	
v/s Ratio Perm	0.00			c0.00			0.05					0.01
v/c Ratio	0.28	0.02		0.17	0.01		0.11	0.67			0.35	0.03
Uniform Delay, d1	31.8	32.1		31.6	33.2		8.9	8.8			12.6	10.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.6	0.2		1.3	0.3		0.1	1.8			0.4	0.0
Delay (s)	34.4	32.4		32.9	33.5		9.0	10.6			13.0	10.8
Level of Service	C	C		C	C		A	B			B	B
Approach Delay (s)		33.1			33.2			10.5			12.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	6	14	563	219	6
Future Vol, veh/h	20	6	14	563	219	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	240
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	50	80	84	82	63
Heavy Vehicles, %	2	2	2	6	18	20
Mvmt Flow	35	12	18	670	267	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	973	267	277	0	-	0
Stage 1	267	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	280	772	1286	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	772	1286	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	489	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1286	-	328	-	-
HCM Lane V/C Ratio	0.014	-	0.144	-	-
HCM Control Delay (s)	7.8	0	17.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

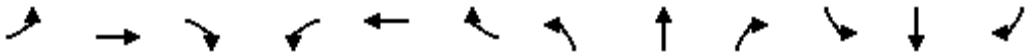
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	117	42	525	197	12
Future Vol, veh/h	46	117	42	525	197	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	79	92	82	83	56
Heavy Vehicles, %	7	8	9	6	12	2
Mvmt Flow	61	148	46	640	237	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	980	248	258	0	-	0
Stage 1	248	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Critical Hdwy	6.47	6.28	4.19	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.372	2.281	-	-	-
Pot Cap-1 Maneuver	271	776	1267	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	256	776	1267	-	-	-
Mov Cap-2 Maneuver	256	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	467	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.9	0.5	0
HCM LOS	C		

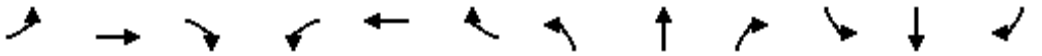
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1267	-	487	-	-
HCM Lane V/C Ratio	0.036	-	0.43	-	-
HCM Control Delay (s)	7.9	0	17.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	361	1643	236	24	786	118	240	190	103	171	169	182
v/c Ratio	0.93	0.90	0.27	0.24	0.74	0.20	0.72	0.62	0.25	0.54	0.63	0.52
Control Delay	78.4	24.6	1.7	72.4	51.4	1.1	55.0	68.8	1.5	45.9	71.9	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.4	24.6	1.7	72.4	51.4	1.1	55.0	68.8	1.5	45.9	71.9	14.8
Queue Length 50th (ft)	308	820	14	23	369	0	186	178	0	127	159	7
Queue Length 95th (ft)	m#463	#1009	11	45	365	0	229	266	0	159	216	33
Internal Link Dist (ft)		1573			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	412	1816	862	141	1067	592	342	306	405	333	269	349
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.90	0.27	0.17	0.74	0.20	0.70	0.62	0.25	0.51	0.63	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	318	1528	163	18	605	92	187	171	66	130	137	133
Future Volume (vph)	318	1528	163	18	605	92	187	171	66	130	137	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3505	1538	1770	3406	1495	1687	1863	1583	1719	1845	1369
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.49	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	1719	3505	1538	1770	3406	1495	871	1863	1583	833	1845	1369
Peak-hour factor, PHF	0.88	0.93	0.69	0.75	0.77	0.78	0.78	0.90	0.64	0.76	0.81	0.73
Adj. Flow (vph)	361	1643	236	24	786	118	240	190	103	171	169	182
RTOR Reduction (vph)	0	0	68	0	0	81	0	0	86	0	0	149
Lane Group Flow (vph)	361	1643	168	24	786	37	240	190	17	171	169	33
Heavy Vehicles (%)	5%	3%	5%	2%	6%	8%	7%	2%	2%	5%	3%	18%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2	2		6
Actuated Green, G (s)	34.1	75.3	75.3	5.8	47.0	47.0	40.2	24.7	24.7	40.2	21.9	21.9
Effective Green, g (s)	34.1	75.3	75.3	5.8	47.0	47.0	40.2	24.7	24.7	40.2	21.9	21.9
Actuated g/C Ratio	0.23	0.50	0.50	0.04	0.31	0.31	0.27	0.16	0.16	0.27	0.15	0.15
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	390	1759	772	68	1067	468	332	306	260	314	269	199
v/s Ratio Prot	c0.21	c0.47		0.01	0.23		c0.09	c0.10		0.06	0.09	
v/s Ratio Perm			0.11			0.02	c0.11		0.01	0.09		0.02
v/c Ratio	0.93	0.93	0.22	0.35	0.74	0.08	0.72	0.62	0.07	0.54	0.63	0.17
Uniform Delay, d1	56.7	35.0	20.9	70.3	46.0	36.3	47.0	58.3	52.9	44.8	60.2	56.1
Progression Factor	1.04	0.55	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.3	6.7	0.4	4.3	4.5	0.3	7.6	4.4	0.1	2.1	10.6	1.8
Delay (s)	77.0	26.0	3.3	74.5	50.5	36.6	54.5	62.7	53.0	47.0	70.9	57.9
Level of Service	E	C	A	E	D	D	D	E	D	D	E	E
Approach Delay (s)		31.8			49.4			57.2			58.5	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.7
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	21.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1877	5	47	724	0	0	3	116	1	1	2
Future Vol, veh/h	2	1877	5	47	724	0	0	3	116	1	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	400	-	410	385	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	88	63	53	86	100	100	75	73	25	25	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	2133	8	89	842	0	0	4	159	4	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	842	0	0	2141	0	0	2742	3161	1067	2097	3169	421
Stage 1	-	-	-	-	-	-	2141	2141	-	1020	1020	-
Stage 2	-	-	-	-	-	-	601	1020	-	1077	2149	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	789	-	-	249	-	-	9	10	218	30	10	581
Stage 1	-	-	-	-	-	-	50	87	-	253	312	-
Stage 2	-	-	-	-	-	-	454	312	-	234	87	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	789	-	-	249	-	-	3	6	218	~ 3	6	581
Mov Cap-2 Maneuver	-	-	-	-	-	-	3	6	-	~ 3	6	-
Stage 1	-	-	-	-	-	-	50	87	-	252	201	-
Stage 2	-	-	-	-	-	-	284	201	-	60	87	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	288.6	$ 1598.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	117	789	-	-	249	-	-	6
HCM Lane V/C Ratio	1.392	0.005	-	-	0.356	-	-	2
HCM Control Delay (s)	288.6	9.6	-	-	27.2	-	-	$ 1598.5
HCM Lane LOS	F	A	-	-	D	-	-	F
HCM 95th %tile Q(veh)	11.2	0	-	-	1.5	-	-	2.5

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	438	191	159	204	272	682
v/c Ratio	0.72	0.31	0.51	0.19	0.63	0.79
Control Delay	33.8	5.1	41.2	9.1	37.4	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	5.1	41.2	9.1	37.4	11.8
Queue Length 50th (ft)	200	0	76	46	126	21
Queue Length 95th (ft)	240	9	150	82	228	169
Internal Link Dist (ft)	1544			1207	1360	
Turn Bay Length (ft)		260	475		230	230
Base Capacity (vph)	934	852	879	1687	666	988
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.22	0.18	0.12	0.41	0.69

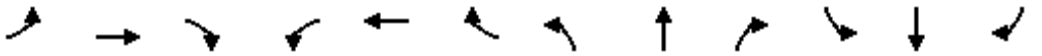
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	285	126	129	161	223	614
Future Volume (vph)	285	126	129	161	223	614
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1509	1752	1810	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1509	1752	1810	1770	1583
Peak-hour factor, PHF	0.65	0.66	0.81	0.79	0.82	0.90
Adj. Flow (vph)	438	191	159	204	272	682
RTOR Reduction (vph)	0	127	0	0	0	474
Lane Group Flow (vph)	438	64	159	204	272	208
Heavy Vehicles (%)	2%	7%	3%	5%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	8		7	4	2	
Permitted Phases		8				2
Actuated Green, G (s)	27.9	27.9	14.9	49.3	20.7	20.7
Effective Green, g (s)	27.9	27.9	14.9	49.3	20.7	20.7
Actuated g/C Ratio	0.33	0.33	0.18	0.59	0.25	0.25
Clearance Time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	3.5	3.5
Lane Grp Cap (vph)	622	504	312	1068	438	392
v/s Ratio Prot	c0.24		c0.09	0.11	c0.15	
v/s Ratio Perm		0.04				0.13
v/c Ratio	0.70	0.13	0.51	0.19	0.62	0.53
Uniform Delay, d1	24.2	19.3	31.0	7.9	27.9	27.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.2	1.8	0.1	2.9	1.6
Delay (s)	28.1	19.5	32.8	8.0	30.8	28.8
Level of Service	C	B	C	A	C	C
Approach Delay (s)	25.5			18.9	29.3	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	16	29	63	58	19	411	62	19	701	39
v/c Ratio	0.29	0.05	0.07	0.19	0.27	0.05	0.40	0.06	0.03	0.65	0.05
Control Delay	35.0	46.1	0.4	32.2	33.7	8.3	16.2	0.1	8.2	21.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	46.1	0.4	32.2	33.7	8.3	16.2	0.1	8.2	21.4	0.1
Queue Length 50th (ft)	23	7	0	20	14	4	124	0	4	261	0
Queue Length 95th (ft)	68	19	0	47	16	4	196	0	9	525	0
Internal Link Dist (ft)		485			2182		548			2133	
Turn Bay Length (ft)	150		85	175		250		240	200		240
Base Capacity (vph)	250	301	408	337	226	387	1421	1291	595	1491	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.05	0.07	0.19	0.26	0.05	0.29	0.05	0.03	0.47	0.04

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	8	17	34	12	15	6	304	31	12	652	24
Future Volume (vph)	50	8	17	34	12	15	6	304	31	12	652	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1467	1863	1583	1770	1742		1770	1759	1553	1770	1845	1129
Flt Permitted	0.72	1.00	1.00	0.75	1.00		0.19	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1111	1863	1583	1392	1742		361	1759	1553	830	1845	1129
Peak-hour factor, PHF	0.70	0.50	0.58	0.54	0.36	0.60	0.31	0.74	0.50	0.63	0.93	0.61
Adj. Flow (vph)	71	16	29	63	33	25	19	411	62	19	701	39
RTOR Reduction (vph)	0	0	26	0	22	0	0	0	32	0	0	20
Lane Group Flow (vph)	71	16	3	63	36	0	19	411	30	19	701	19
Heavy Vehicles (%)	23%	2%	2%	2%	2%	2%	2%	8%	4%	2%	3%	43%
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8			6		2	2		6
Actuated Green, G (s)	13.1	9.2	9.2	13.1	7.4		45.1	43.1	43.1	45.1	43.1	43.1
Effective Green, g (s)	13.1	9.2	9.2	13.1	7.4		45.1	43.1	43.1	45.1	43.1	43.1
Actuated g/C Ratio	0.15	0.10	0.10	0.15	0.08		0.50	0.48	0.48	0.50	0.48	0.48
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	185	191	162	219	143		213	846	747	438	887	543
v/s Ratio Prot	c0.02	0.01		0.01	0.02		c0.00	0.23		0.00	c0.38	
v/s Ratio Perm	c0.03		0.00	0.03			0.04		0.02	0.02		0.02
v/c Ratio	0.38	0.08	0.02	0.29	0.25		0.09	0.49	0.04	0.04	0.79	0.03
Uniform Delay, d1	34.3	36.4	36.1	33.9	38.5		14.0	15.7	12.3	11.4	19.5	12.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.2	0.1	0.9	1.1		0.2	0.6	0.0	0.0	5.1	0.0
Delay (s)	35.9	36.6	36.2	34.7	39.6		14.2	16.3	12.3	11.4	24.6	12.3
Level of Service	D	D	D	C	D		B	B	B	B	C	B
Approach Delay (s)		36.1			37.1			15.8			23.6	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	31.4
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	62	0	0	0	0	283	90	241	632	0
Future Vol, veh/h	4	0	62	0	0	0	0	283	90	241	632	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	25	-	-	-	-	-	-	-	270	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	100	52	100	100	100	100	83	83	84	92	100
Heavy Vehicles, %	33	2	17	2	2	2	2	9	8	2	2	2
Mvmt Flow	11	0	119	0	0	0	0	341	108	287	687	0

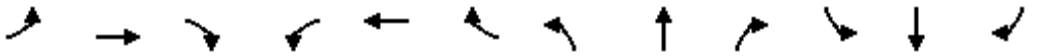
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1602	1602	687				-	0	0	341	0	0
Stage 1	1261	1261	-				-	-	-	-	-	-
Stage 2	341	341	-				-	-	-	-	-	-
Critical Hdwy	6.73	6.52	6.37				-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.73	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.73	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.797	4.018	3.453				-	-	-	2.218	-	-
Pot Cap-1 Maneuver	98	106	422				0	-	-	1218	-	0
Stage 1	230	241	-				0	-	-	-	-	0
Stage 2	656	639	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	75	0	422				-	-	-	1218	-	-
Mov Cap-2 Maneuver	135	0	-				-	-	-	-	-	-
Stage 1	230	0	-				-	-	-	-	-	-
Stage 2	501	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	135	459	1218	-
HCM Lane V/C Ratio	-	-	0.078	0.26	0.236	-
HCM Control Delay (s)	-	-	33.9	15.6	8.9	-
HCM Lane LOS	-	-	D	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	1	0.9	-

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	117	400	56	288	805	12
v/c Ratio	0.46	0.69	0.20	0.26	0.81	0.02
Control Delay	44.0	11.4	7.0	6.4	24.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	11.4	7.0	6.4	24.1	0.0
Queue Length 50th (ft)	60	0	9	52	359	0
Queue Length 95th (ft)	134	65	17	88	580	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	250		250			50
Base Capacity (vph)	371	663	317	1522	1423	853
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.60	0.18	0.19	0.57	0.01

Intersection Summary

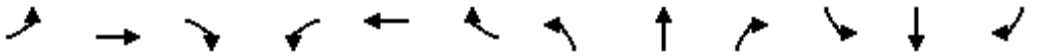


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	108	0	340	39	248	0	0	765	3
Future Volume (vph)	0	0	0	108	0	340	39	248	0	0	765	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		1.00	1.00	1.00			1.00	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1671		1583	1517	1743			1863	1077
Flt Permitted				0.95		1.00	0.16	1.00			1.00	1.00
Satd. Flow (perm)				1671		1583	250	1743			1863	1077
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	1.00	0.85	0.70	0.86	1.00	1.00	0.95	0.25
Adj. Flow (vph)	0	0	0	117	0	400	56	288	0	0	805	12
RTOR Reduction (vph)	0	0	0	0	0	341	0	0	0	0	0	6
Lane Group Flow (vph)	0	0	0	117	0	59	56	288	0	0	805	6
Heavy Vehicles (%)	2%	2%	2%	8%	2%	2%	19%	9%	2%	2%	2%	50%
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				12.1		12.1	46.4	53.9			42.6	42.6
Effective Green, g (s)				12.1		12.1	46.4	53.9			42.6	42.6
Actuated g/C Ratio				0.15		0.15	0.57	0.66			0.52	0.52
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				247		234	200	1149			971	561
v/s Ratio Prot				c0.07			0.01	c0.17			c0.43	
v/s Ratio Perm						0.04	0.15					0.01
v/c Ratio				0.47		0.25	0.28	0.25			0.83	0.01
Uniform Delay, d1				31.9		30.8	11.9	5.7			16.5	9.4
Progression Factor				1.00		1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.7		0.7	0.9	0.2			6.2	0.0
Delay (s)				33.6		31.5	12.8	5.8			22.7	9.4
Level of Service				C		C	B	A			C	A
Approach Delay (s)		0.0			32.0			7.0			22.5	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	81.7	Sum of lost time (s)	23.2
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	151	16	16	67	327	11	648	40
v/c Ratio	0.44	0.29	0.07	0.03	0.19	0.33	0.02	0.77	0.05
Control Delay	39.8	1.5	33.6	0.1	8.0	10.7	6.8	26.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	1.5	33.6	0.1	8.0	10.7	6.8	26.1	0.1
Queue Length 50th (ft)	42	0	6	0	8	49	1	222	0
Queue Length 95th (ft)	60	0	16	0	28	163	4	475	0
Internal Link Dist (ft)		347		749		490		984	
Turn Bay Length (ft)			30		200		250		240
Base Capacity (vph)	244	519	236	646	385	1366	687	1457	1292
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.29	0.07	0.02	0.17	0.24	0.02	0.44	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	0	74	8	0	8	55	247	5	4	596	33
Future Volume (vph)	51	0	74	8	0	8	55	247	5	4	596	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1380		1770	1723		1770	1845	1583
Flt Permitted	0.85	1.00		0.66	1.00		0.22	1.00		0.54	1.00	1.00
Satd. Flow (perm)	1585	1583		1231	1380		401	1723		1000	1845	1583
Peak-hour factor, PHF	0.49	0.49	0.49	0.50	0.82	0.50	0.82	0.78	0.50	0.38	0.92	0.82
Adj. Flow (vph)	104	0	151	16	0	16	67	317	10	11	648	40
RTOR Reduction (vph)	0	137	0	0	15	0	0	1	0	0	0	22
Lane Group Flow (vph)	104	14	0	16	1	0	67	326	0	11	648	18
Heavy Vehicles (%)	2%	2%	2%	2%	2%	17%	2%	10%	2%	2%	3%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	10.6	8.4		10.6	4.7		45.5	44.5		45.5	39.8	39.8
Effective Green, g (s)	10.6	8.4		10.6	4.7		45.5	44.5		45.5	39.8	39.8
Actuated g/C Ratio	0.12	0.10		0.12	0.05		0.52	0.51		0.52	0.45	0.45
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	4.0
Lane Grp Cap (vph)	204	151		162	74		297	876		528	839	720
v/s Ratio Prot	c0.03	0.01		0.00	0.00		c0.01	c0.19		0.00	c0.35	
v/s Ratio Perm	c0.03			c0.01			0.10			0.01		0.01
v/c Ratio	0.51	0.10		0.10	0.01		0.23	0.37		0.02	0.77	0.03
Uniform Delay, d1	35.9	36.1		34.1	39.2		12.8	13.0		10.2	20.0	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.3		0.3	0.1		0.5	0.4		0.0	4.7	0.0
Delay (s)	38.3	36.4		34.4	39.3		13.3	13.4		10.2	24.8	13.2
Level of Service	D	D		C	D		B	B		B	C	B
Approach Delay (s)		37.2			36.8			13.4			23.9	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	31.4
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	19	15	300	668	20
Future Vol, veh/h	12	19	15	300	668	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	240
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	49	82	71	89	50
Heavy Vehicles, %	2	2	2	6	3	2
Mvmt Flow	19	39	18	423	751	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1210	751	791	0	-	0
Stage 1	751	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	202	411	829	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	196	411	829	-	-	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.7	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	829	-	302	-	-
HCM Lane V/C Ratio	0.022	-	0.191	-	-
HCM Control Delay (s)	9.4	0	19.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

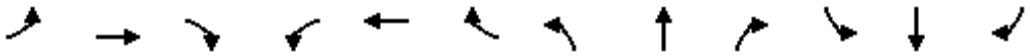
Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	87	86	291	592	69
Future Vol, veh/h	12	87	86	291	592	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	79	82	83	93	84
Heavy Vehicles, %	11	4	4	4	2	2
Mvmt Flow	16	110	105	351	637	82

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1239	678	719	0	-	0
Stage 1	678	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Critical Hdwy	6.51	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	186	449	873	-	-	-
Stage 1	488	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	449	873	-	-	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20	2.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	873	-	364	-	-
HCM Lane V/C Ratio	0.12	-	0.347	-	-
HCM Control Delay (s)	9.7	0	20	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	1.5	-	-

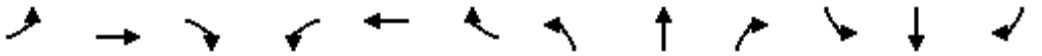


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	216	1015	202	56	2036	180	173	134	58	125	205	447
v/c Ratio	0.82	0.53	0.22	0.48	1.32	0.24	0.64	0.41	0.16	0.40	0.71	0.95
Control Delay	99.6	29.9	10.5	98.4	188.4	15.9	63.5	72.9	1.4	55.0	89.9	59.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.6	29.9	10.5	98.4	188.4	15.9	63.5	72.9	1.4	55.0	89.9	59.5
Queue Length 50th (ft)	262	441	51	68	~1715	57	165	147	0	116	242	244
Queue Length 95th (ft)	367	519	87	125	#1762	85	239	180	0	191	364	#501
Internal Link Dist (ft)		1573			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	368	1905	914	386	1545	749	296	356	381	324	305	485
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.22	0.15	1.32	0.24	0.58	0.38	0.15	0.39	0.67	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	893	164	53	1690	133	145	94	39	114	193	402
Future Volume (vph)	194	893	164	53	1690	133	145	94	39	114	193	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	3505	1583	1770	3539	1583	1770	1863	1583	1719	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.36	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	1687	3505	1583	1770	3539	1583	668	1863	1583	1049	1863	1583
Peak-hour factor, PHF	0.90	0.88	0.81	0.94	0.83	0.74	0.84	0.70	0.67	0.91	0.94	0.90
Adj. Flow (vph)	216	1015	202	56	2036	180	173	134	58	125	205	447
RTOR Reduction (vph)	0	0	55	0	0	58	0	0	48	0	0	228
Lane Group Flow (vph)	216	1015	147	56	2036	122	173	134	10	125	205	219
Heavy Vehicles (%)	7%	3%	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2	2		6
Actuated Green, G (s)	28.8	100.1	100.1	10.5	81.8	81.8	46.1	32.3	32.3	46.1	28.5	28.5
Effective Green, g (s)	28.8	100.1	100.1	10.5	81.8	81.8	46.1	32.3	32.3	46.1	28.5	28.5
Actuated g/C Ratio	0.16	0.54	0.54	0.06	0.44	0.44	0.25	0.17	0.17	0.25	0.15	0.15
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	262	1892	854	100	1561	698	270	324	275	310	286	243
v/s Ratio Prot	c0.13	0.29		0.03	c0.58		c0.06	c0.07		0.03	0.11	
v/s Ratio Perm			0.09			0.08	0.10		0.01	0.07		c0.14
v/c Ratio	0.82	0.54	0.17	0.56	1.30	0.18	0.64	0.41	0.04	0.40	0.72	0.90
Uniform Delay, d1	75.9	27.6	21.6	85.2	51.8	31.4	58.5	68.1	63.6	56.5	74.6	77.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	0.5	0.2	8.4	141.7	0.2	5.1	1.2	0.1	1.0	8.8	32.5
Delay (s)	94.4	28.2	21.8	93.6	193.5	31.5	63.6	69.3	63.7	57.5	83.5	109.6
Level of Service	F	C	C	F	F	C	E	E	E	E	F	F
Approach Delay (s)		37.3			178.2			65.7			94.3	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	114.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	185.4	Sum of lost time (s)	28.7
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	33.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1066	2	129	1750	1	0	2	41	5	1	0
Future Vol, veh/h	1	1066	2	129	1750	1	0	2	41	5	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	400	-	410	385	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	87	50	90	92	25	100	50	93	42	25	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1225	4	143	1902	4	0	4	44	12	4	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1906	0	0	1229	0	0	2472	3425	613	2813	3427	953
Stage 1	-	-	-	-	-	-	1233	1233	-	2190	2190	-
Stage 2	-	-	-	-	-	-	1239	2192	-	623	1237	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	308	-	-	563	-	-	15	7	435	~ 8	7	260
Stage 1	-	-	-	-	-	-	187	247	-	46	82	-
Stage 2	-	-	-	-	-	-	186	82	-	440	246	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	308	-	-	563	-	-	4	5	435	~ 2	5	260
Mov Cap-2 Maneuver	-	-	-	-	-	-	4	5	-	~ 2	5	-
Stage 1	-	-	-	-	-	-	185	244	-	45	61	-
Stage 2	-	-	-	-	-	-	130	61	-	384	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	219.9	$ 6350.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	53	308	-	-	563	-	-	2
HCM Lane V/C Ratio	0.907	0.013	-	-	0.255	-	-	7.952
HCM Control Delay (s)	219.9	16.8	-	-	13.6	-	-	$ 6350.6
HCM Lane LOS	F	C	-	-	B	-	-	F
HCM 95th %tile Q(veh)	4	0	-	-	1	-	-	3.5

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	164	240	858	219	128	224
v/c Ratio	0.53	0.52	1.04	0.17	0.55	0.55
Control Delay	40.2	8.9	69.0	4.9	44.8	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	8.9	69.0	4.9	44.8	10.5
Queue Length 50th (ft)	82	0	~504	33	65	0
Queue Length 95th (ft)	151	62	#809	63	109	63
Internal Link Dist (ft)	1544			1207	1360	
Turn Bay Length (ft)		260	475		230	230
Base Capacity (vph)	866	864	823	1806	594	698
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.28	1.04	0.12	0.22	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	154	221	738	184	100	215
Future Volume (vph)	154	221	738	184	100	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1703	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1703	1583
Peak-hour factor, PHF	0.94	0.92	0.86	0.84	0.78	0.96
Adj. Flow (vph)	164	240	858	219	128	224
RTOR Reduction (vph)	0	200	0	0	0	193
Lane Group Flow (vph)	164	40	858	219	128	31
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	8		7	4	2	
Permitted Phases		8				2
Actuated Green, G (s)	14.3	14.3	40.2	61.0	11.9	11.9
Effective Green, g (s)	14.3	14.3	40.2	61.0	11.9	11.9
Actuated g/C Ratio	0.17	0.17	0.47	0.71	0.14	0.14
Clearance Time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	3.0	3.0
Lane Grp Cap (vph)	308	262	823	1315	234	218
v/s Ratio Prot	c0.09		c0.48	0.12	c0.08	
v/s Ratio Perm		0.03				0.02
v/c Ratio	0.53	0.15	1.04	0.17	0.55	0.14
Uniform Delay, d1	33.0	30.9	23.1	4.2	34.7	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.4	43.0	0.1	2.6	0.3
Delay (s)	35.2	31.2	66.1	4.3	37.3	33.1
Level of Service	D	C	E	A	D	C
Approach Delay (s)	32.9			53.5	34.6	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

2045 No Build

HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 No Build AM
Project Description	James River Freeway EB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	4	Time Period Duration, min	15
Facility Length, mi	2.86		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		5280	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.899	1235	4800	0.26	71.7	8.6	A
2	1.00	0.899	1235	4800	0.26	71.7	8.6	A
3	1.00	0.899	1235	4800	0.26	71.7	8.6	A
4	1.00	0.899	1235	4800	0.26	71.7	8.6	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.922	0.781	1204	205	7200	2000	0.17	0.10	73.0	73.0	5.5	5.5	A
2	1.00	1.00	0.922	0.781	1204	205	7200	2000	0.17	0.10	73.0	73.0	5.5	5.5	A
3	1.00	1.00	0.922	0.781	1204	205	7200	2000	0.17	0.10	73.0	73.0	5.5	5.5	A
4	1.00	1.00	0.922	0.781	1204	205	7200	2000	0.17	0.10	73.0	73.0	5.5	5.5	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.922	1030	4800	0.21	73.0	7.1	A
2	1.00	0.922	1030	4800	0.21	73.0	7.1	A
3	1.00	0.922	1030	4800	0.21	73.0	7.1	A

4	1.00	0.922	1030	4800	0.21	73.0	7.1	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.897	0.917	1741	682	7200	2000	0.24	0.34	73.0	73.0	7.9	7.9	A
2	1.00	1.00	0.897	0.917	1741	682	7200	2000	0.24	0.34	73.0	73.0	7.9	7.9	A
3	1.00	1.00	0.897	0.917	1741	682	7200	2000	0.24	0.34	73.0	73.0	7.9	7.9	A
4	1.00	1.00	0.897	0.917	1741	682	7200	2000	0.24	0.34	73.0	73.0	7.9	7.9	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.890	1770	4800	0.37	71.7	12.3	B
2	1.00	0.890	1770	4800	0.37	71.7	12.3	B
3	1.00	0.890	1770	4800	0.37	71.7	12.3	B
4	1.00	0.890	1770	4800	0.37	71.7	12.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.0	9.3	8.3	2.40	A
2	72.0	9.3	8.3	2.40	A
3	72.0	9.3	8.3	2.40	A
4	72.0	9.3	8.3	2.40	A

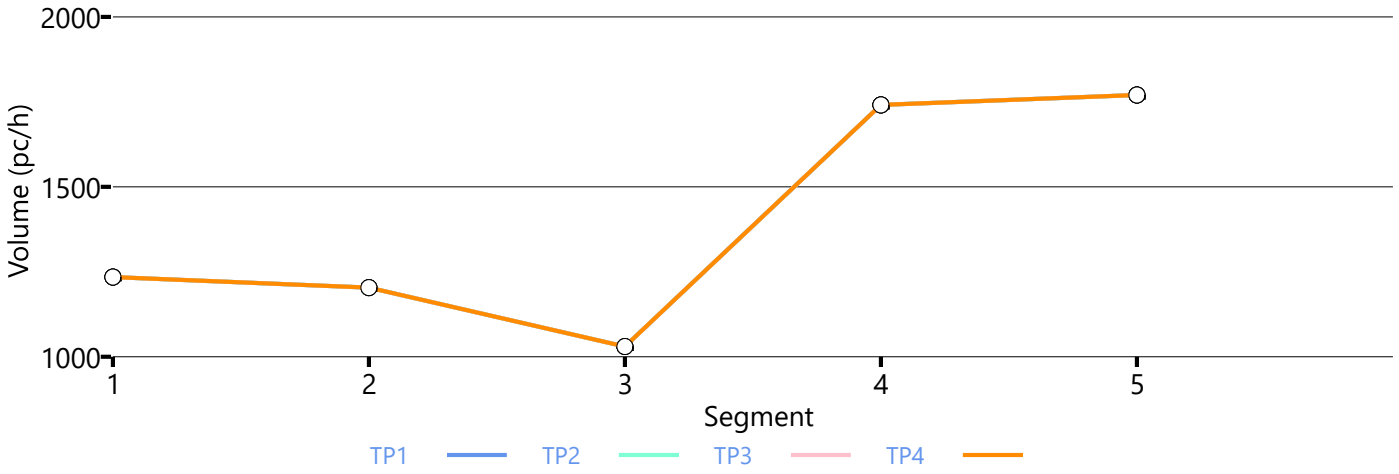
Facility Overall Results

Space Mean Speed, mi/h	72.0	Density, veh/mi/ln	8.3
Average Travel Time, min	2.40	Density, pc/mi/ln	9.3

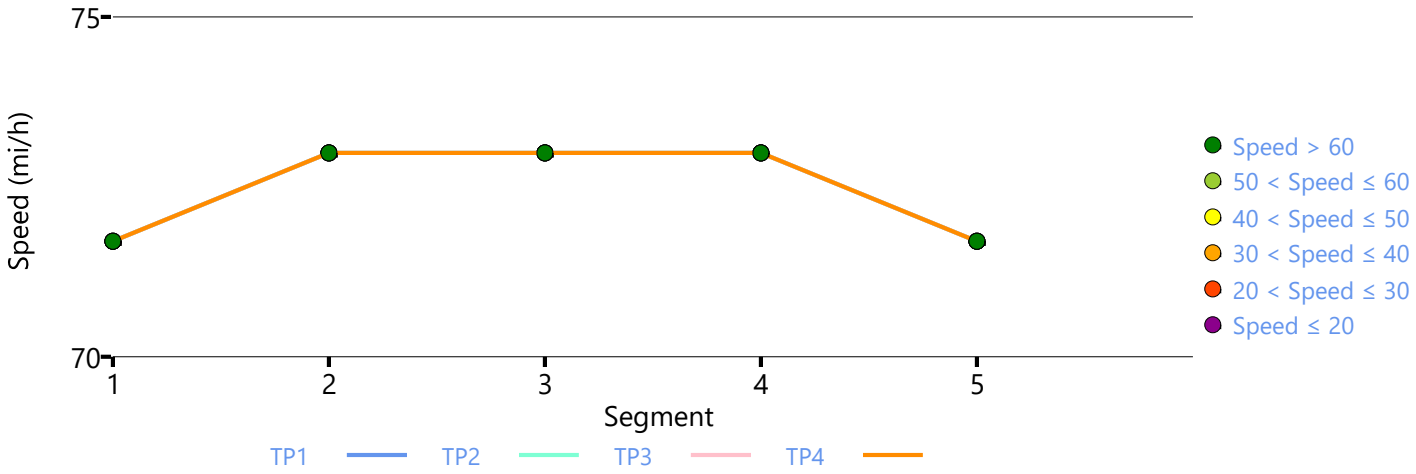
Messages

Comments

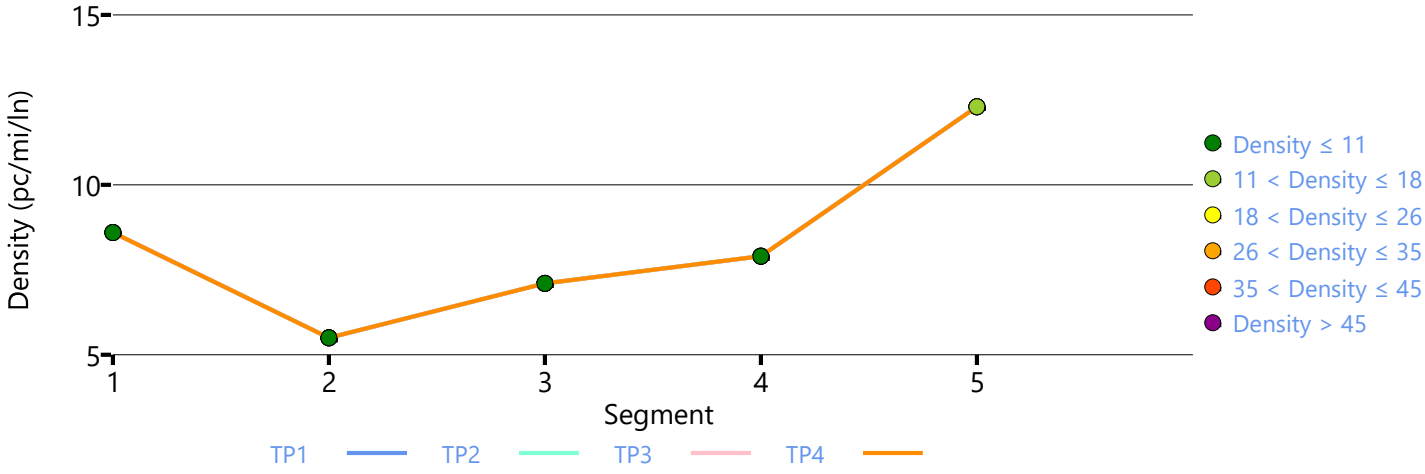
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 No Build AM
Project Description	James River Freeway WB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	4	Time Period Duration, min	15
Facility Length, mi	3.18		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		5280	2
2	Diverge	Basic	WB Diverge at MM	2540	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.878	1276	4800	0.27	71.7	8.9	A
2	1.00	0.878	1276	4800	0.27	71.7	8.9	A
3	1.00	0.878	1276	4800	0.27	71.7	8.9	A
4	1.00	0.878	1276	4800	0.27	71.7	8.9	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.871	0.901	1286	633	7200	2000	0.18	0.32	73.0	73.0	5.9	5.9	A
2	1.00	1.00	0.871	0.901	1286	633	7200	2000	0.18	0.32	73.0	73.0	5.9	5.9	A
3	1.00	1.00	0.871	0.901	1286	633	7200	2000	0.18	0.32	73.0	73.0	5.9	5.9	A
4	1.00	1.00	0.871	0.901	1286	633	7200	2000	0.18	0.32	73.0	73.0	5.9	5.9	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.865	636	4800	0.13	73.0	4.4	A
2	1.00	0.865	636	4800	0.13	73.0	4.4	A
3	1.00	0.865	636	4800	0.13	73.0	4.4	A

4	1.00	0.865	636	4800	0.13	73.0	4.4	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.865	0.752	915	279	7200	2000	0.13	0.14	73.0	73.0	4.2	4.2	A
2	1.00	1.00	0.865	0.752	915	279	7200	2000	0.13	0.14	73.0	73.0	4.2	4.2	A
3	1.00	1.00	0.865	0.752	915	279	7200	2000	0.13	0.14	73.0	73.0	4.2	4.2	A
4	1.00	1.00	0.865	0.752	915	279	7200	2000	0.13	0.14	73.0	73.0	4.2	4.2	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.834	911	4800	0.19	71.7	6.4	A
2	1.00	0.834	911	4800	0.19	71.7	6.4	A
3	1.00	0.834	911	4800	0.19	71.7	6.4	A
4	1.00	0.834	911	4800	0.19	71.7	6.4	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	6.5	5.6	2.60	A
2	72.1	6.5	5.6	2.60	A
3	72.1	6.5	5.6	2.60	A
4	72.1	6.5	5.6	2.60	A

Facility Overall Results

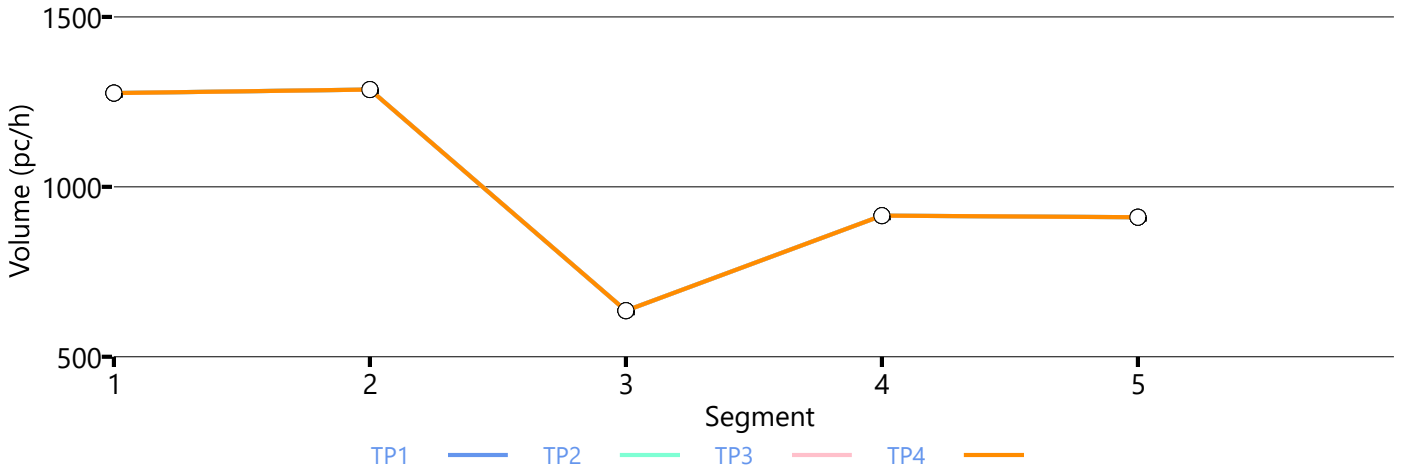
Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	5.6
Average Travel Time, min	2.60	Density, pc/mi/ln	6.5

Messages

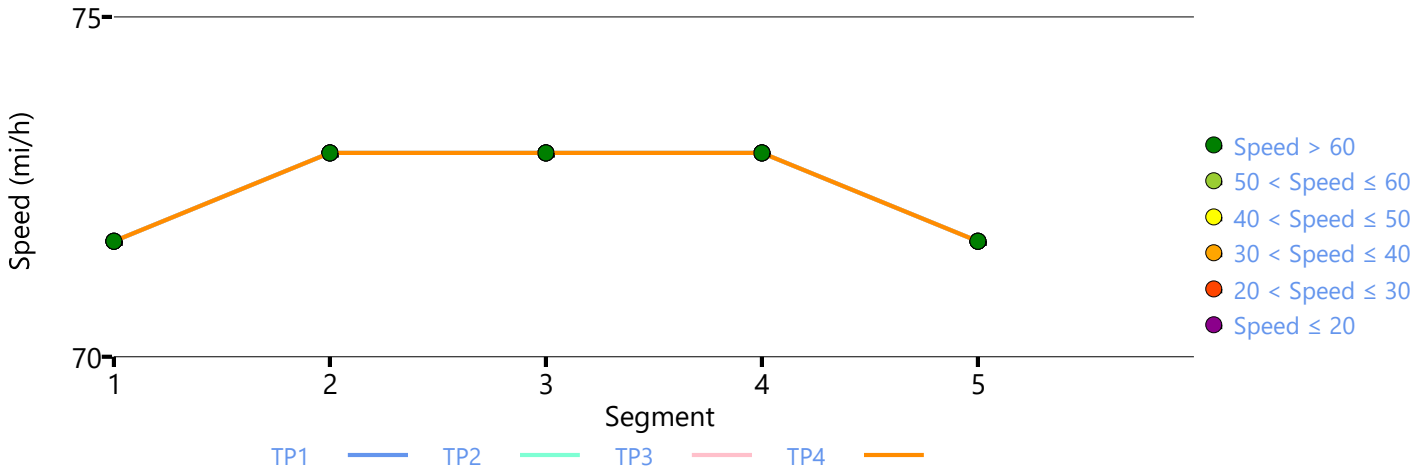
WARNING 1	Ramp segment length is longer than 1500 feet for segment 2.
WARNING 2	Length of accel/decel lane is longer than 1500 feet for segment 2.

Comments

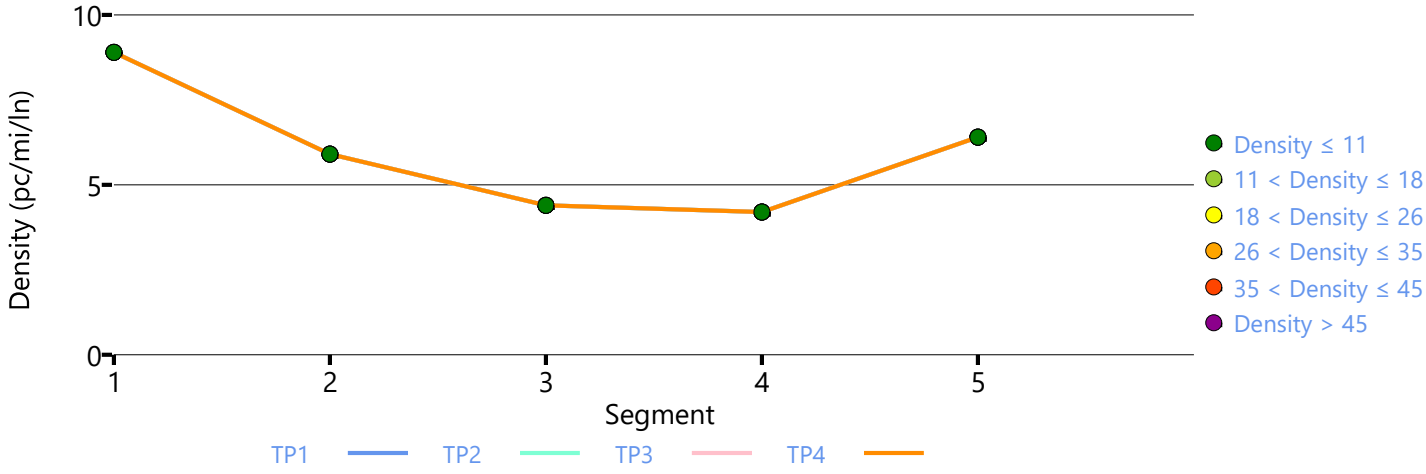
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 No Build PM
Project Description	James River Freeway EB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	4	Time Period Duration, min	15
Facility Length, mi	2.86		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		5280	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.878	1458	4800	0.30	71.7	10.2	A
2	1.00	0.878	1458	4800	0.30	71.7	10.2	A
3	1.00	0.878	1458	4800	0.30	71.7	10.2	A
4	1.00	0.878	1458	4800	0.30	71.7	10.2	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.899	0.781	1424	282	7200	2000	0.20	0.14	73.0	73.0	6.5	6.5	A
2	1.00	1.00	0.899	0.781	1424	282	7200	2000	0.20	0.14	73.0	73.0	6.5	6.5	A
3	1.00	1.00	0.899	0.781	1424	282	7200	2000	0.20	0.14	73.0	73.0	6.5	6.5	A
4	1.00	1.00	0.899	0.781	1424	282	7200	2000	0.20	0.14	73.0	73.0	6.5	6.5	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.899	1179	4800	0.25	73.0	8.1	A
2	1.00	0.899	1179	4800	0.25	73.0	8.1	A
3	1.00	0.899	1179	4800	0.25	73.0	8.1	A

4	1.00	0.899	1179	4800	0.25	73.0	8.1	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.875	0.943	1868	657	7200	2000	0.26	0.33	73.0	73.0	8.5	8.5	A
2	1.00	1.00	0.875	0.943	1868	657	7200	2000	0.26	0.33	73.0	73.0	8.5	8.5	A
3	1.00	1.00	0.875	0.943	1868	657	7200	2000	0.26	0.33	73.0	73.0	8.5	8.5	A
4	1.00	1.00	0.875	0.943	1868	657	7200	2000	0.26	0.33	73.0	73.0	8.5	8.5	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.882	1905	4800	0.40	71.7	13.3	B
2	1.00	0.882	1905	4800	0.40	71.7	13.3	B
3	1.00	0.882	1905	4800	0.40	71.7	13.3	B
4	1.00	0.882	1905	4800	0.40	71.7	13.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.0	10.4	9.2	2.40	A
2	72.0	10.4	9.2	2.40	A
3	72.0	10.4	9.2	2.40	A
4	72.0	10.4	9.2	2.40	A

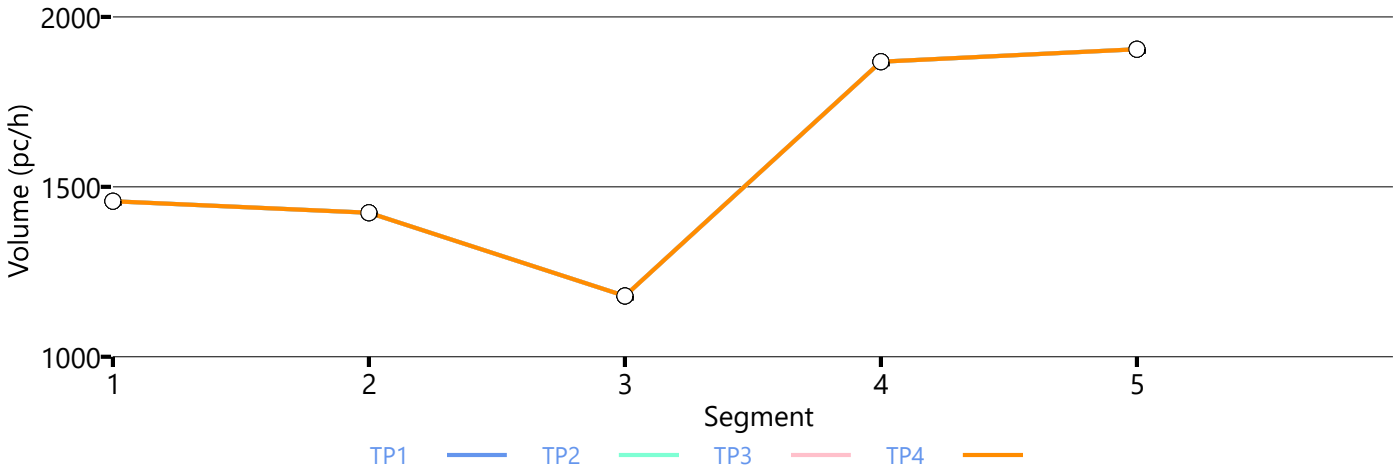
Facility Overall Results

Space Mean Speed, mi/h	72.0	Density, veh/mi/ln	9.2
Average Travel Time, min	2.40	Density, pc/mi/ln	10.4

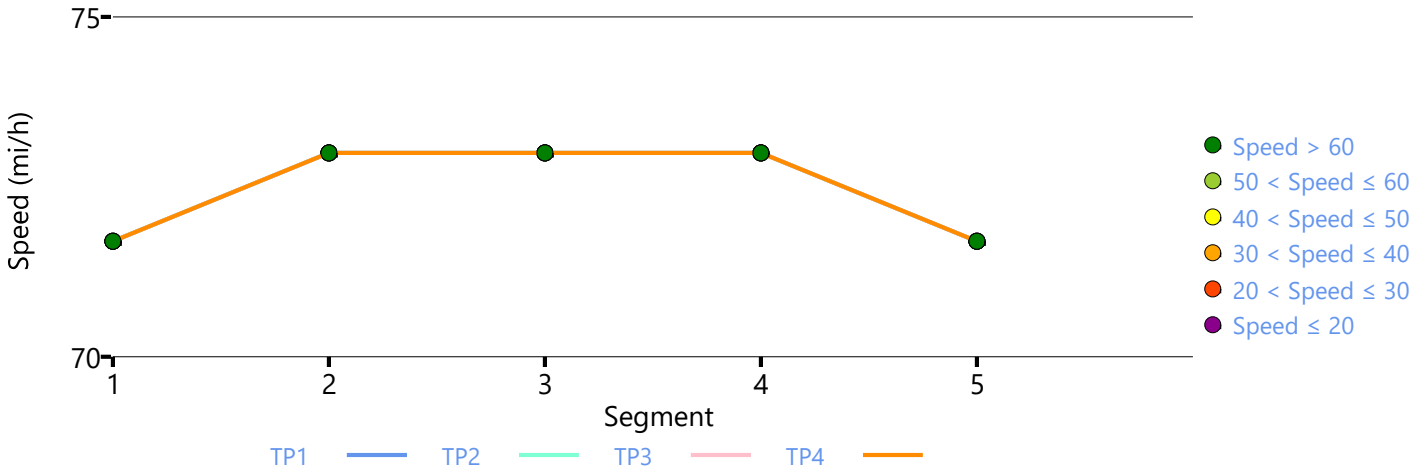
Messages

Comments

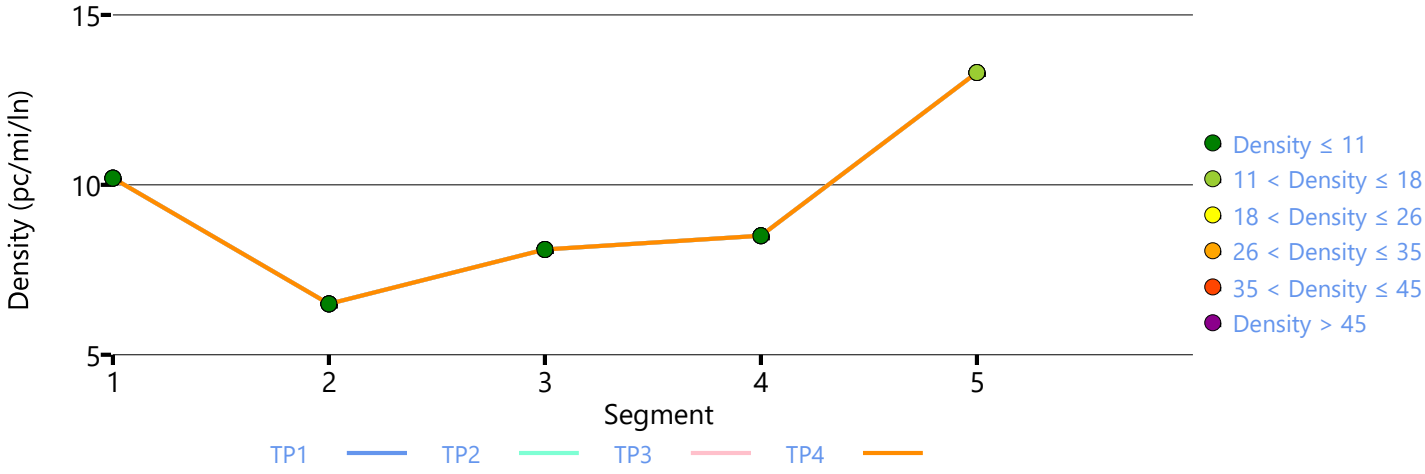
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2021
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 No Build PM
Project Description	James River Freeway WB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	4	Time Period Duration, min	15
Facility Length, mi	3.18		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		5280	2
2	Diverge	Basic	WB Diverge at MM	2540	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.931	1998	4800	0.42	71.7	13.9	B
2	1.00	0.931	1998	4800	0.42	71.7	13.9	B
3	1.00	0.931	1998	4800	0.42	71.7	13.9	B
4	1.00	0.931	1998	4800	0.42	71.7	13.9	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.931	0.952	1998	851	7200	2000	0.28	0.43	73.0	73.0	9.1	9.1	A
2	1.00	1.00	0.931	0.952	1998	851	7200	2000	0.28	0.43	73.0	73.0	9.1	9.1	A
3	1.00	1.00	0.931	0.952	1998	851	7200	2000	0.28	0.43	73.0	73.0	9.1	9.1	A
4	1.00	1.00	0.931	0.952	1998	851	7200	2000	0.28	0.43	73.0	73.0	9.1	9.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.924	1136	4800	0.24	73.0	7.8	A
2	1.00	0.924	1136	4800	0.24	73.0	7.8	A
3	1.00	0.924	1136	4800	0.24	73.0	7.8	A

4	1.00	0.924	1136	4800	0.24	73.0	7.8	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.924	0.730	1314	178	7200	2000	0.18	0.09	73.0	73.0	6.0	6.0	A
2	1.00	1.00	0.924	0.730	1314	178	7200	2000	0.18	0.09	73.0	73.0	6.0	6.0	A
3	1.00	1.00	0.924	0.730	1314	178	7200	2000	0.18	0.09	73.0	73.0	6.0	6.0	A
4	1.00	1.00	0.924	0.730	1314	178	7200	2000	0.18	0.09	73.0	73.0	6.0	6.0	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.900	1311	4800	0.27	71.7	9.1	A
2	1.00	0.900	1311	4800	0.27	71.7	9.1	A
3	1.00	0.900	1311	4800	0.27	71.7	9.1	A
4	1.00	0.900	1311	4800	0.27	71.7	9.1	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	10.0	9.2	2.60	A
2	72.2	10.0	9.2	2.60	A
3	72.2	10.0	9.2	2.60	A
4	72.2	10.0	9.2	2.60	A

Facility Overall Results

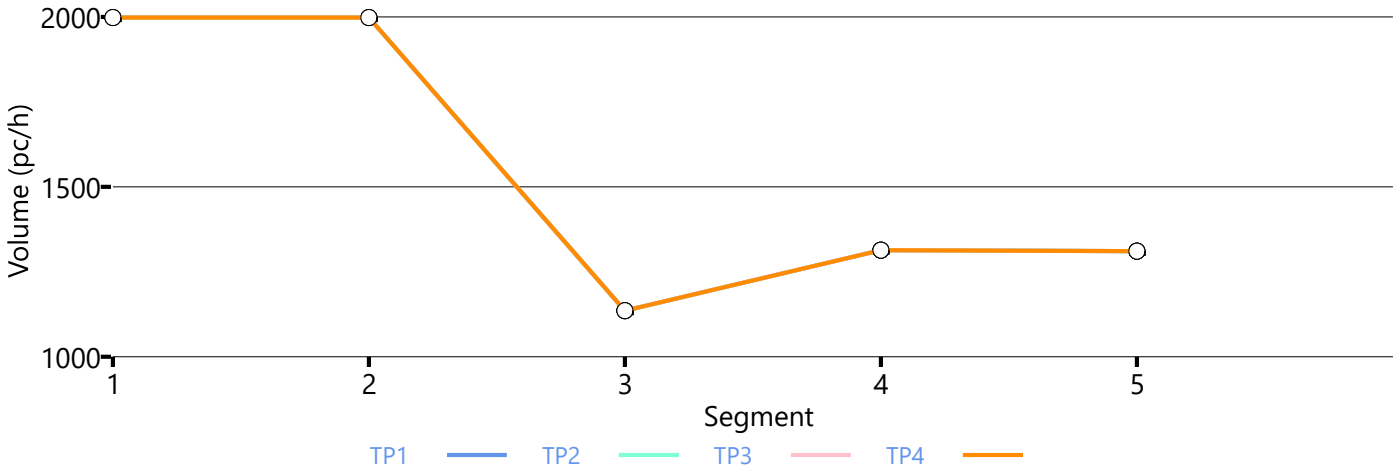
Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	9.2
Average Travel Time, min	2.60	Density, pc/mi/ln	10.0

Messages

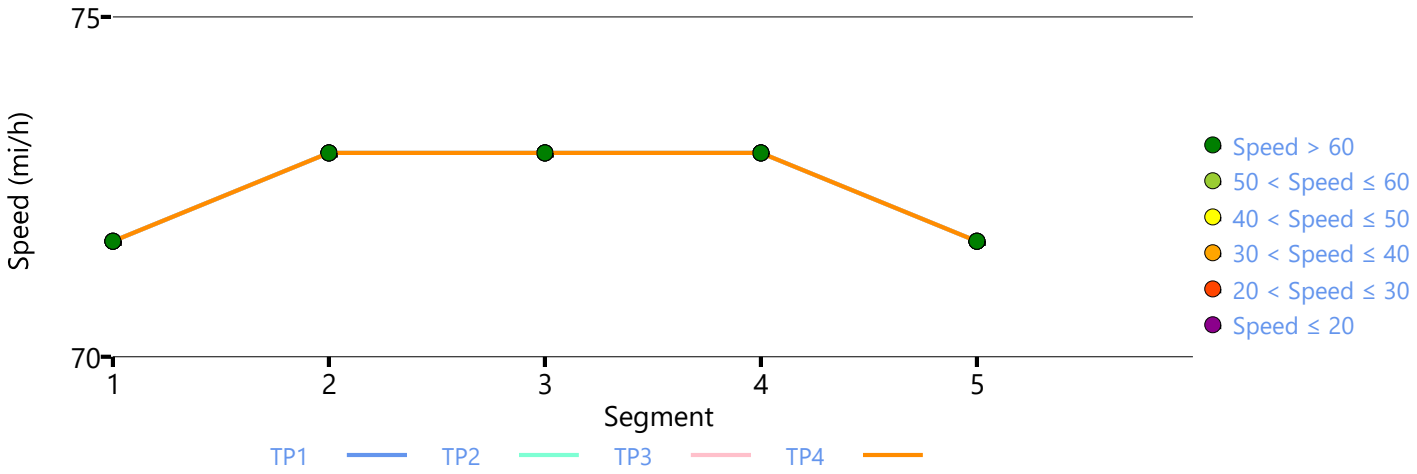
WARNING 1	Ramp segment length is longer than 1500 feet for segment 2.
WARNING 2	Length of accel/decel lane is longer than 1500 feet for segment 2.

Comments

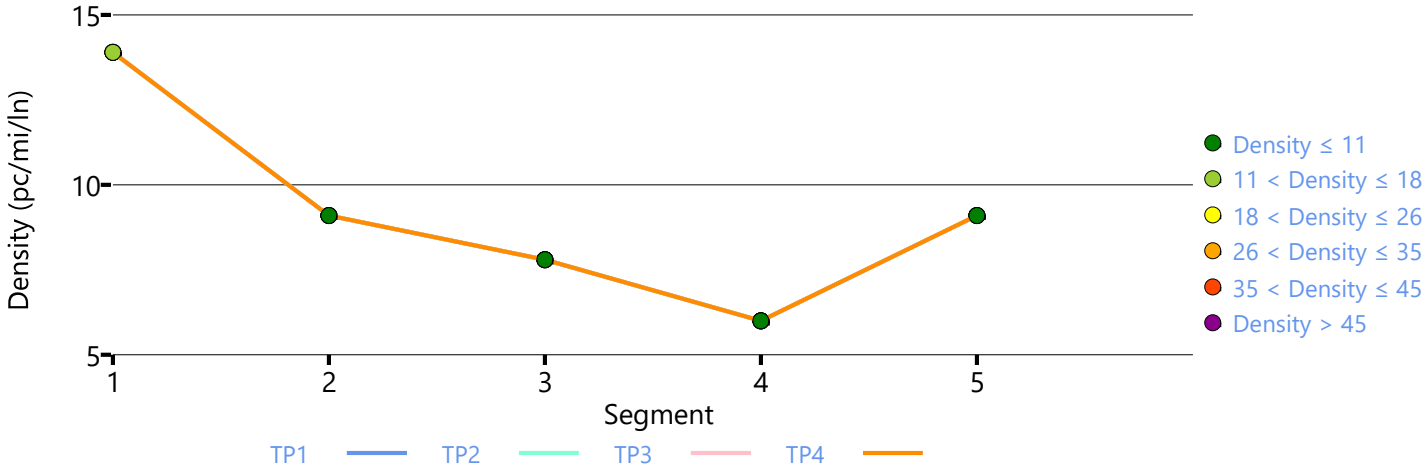
Volume Distribution



Speed Distribution



Density Distribution



QUEUE ANALYSIS

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Queues (Distance)

Lane Number	Contin. Lane	Deg. Satn v/c	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft) Av.	Back of Queue (ft) 95%	Queue at Start of Green (ft) Av.	Queue at Start of Green (ft) 95%	Cycle Average Queue (ft) Av.	Cycle Average Queue (ft) 95%	Queue Storage Ratio Av.	Queue Storage Ratio 95%	Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
South: Farm Road 103															
Lane 1		1.701	1.000	1073.4	1174.3	2918.6	NA	NA	1946.0	3530.2	0.73	1.82	27.3	NA	NA
Approach		1.701			1174.3	2918.6	NA	NA	1946.0	3530.2	0.73	1.82			
East: W State Highway M															
Lane 1		0.654	1.000	23.4	84.4	209.7	NA	NA	62.0	112.4	0.05	0.13	0.0	NA	NA
Approach		0.654			84.4	209.7	NA	NA	62.0	112.4	0.05	0.13			
North: Farm Road 103															
Lane 1		0.205	1.000	0.0	8.3	20.7	NA	NA	7.5	13.7	0.01	0.01	0.0	NA	NA
Approach		0.205			8.3	20.7	NA	NA	7.5	13.7	0.01	0.01			
West: W Republic Road															
Lane 1		1.191	1.000	734.0	982.3	2441.3	NA	NA	951.0	1725.2	0.82	2.03	33.4	NA	NA
Lane 2		0.762	1.000	49.8	139.0	345.4	NA	NA	96.4	174.8	0.38	0.95	NA	3.4	1
Approach		1.191			982.3	2441.3	NA	NA	951.0	1725.2	0.82	2.03			
Intersection		1.701			1174.3	2918.6	NA	NA	1946.0	3530.2	0.82	2.03			

Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.

Lane Queues (Vehicles)

Lane Number	Contin. Lane	Deg. Satn v/c	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh) Av.	Back of Queue (veh) 95%	Queue at Start of Green (veh) Av.	Queue at Start of Green (veh) 95%	Cycle Average Queue (veh) Av.	Cycle Average Queue (veh) 95%	Queue Storage Ratio Av.	Queue Storage Ratio 95%	Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
South: Farm Road 103															
Lane 1		1.701	1.000	42.2	46.1	114.7	NA	NA	76.5	138.7	0.73	1.82	27.3	NA	NA
Approach		1.701			46.1	114.7	NA	NA	76.5	138.7	0.73	1.82			
East: W State Highway M															
Lane 1		0.654	1.000	0.9	3.3	8.2	NA	NA	2.4	4.4	0.05	0.13	0.0	NA	NA
Approach		0.654			3.3	8.2	NA	NA	2.4	4.4	0.05	0.13			
North: Farm Road 103															
Lane 1		0.205	1.000	0.0	0.3	0.8	NA	NA	0.3	0.5	0.01	0.01	0.0	NA	NA
Approach		0.205			0.3	0.8	NA	NA	0.3	0.5	0.01	0.01			
West: W Republic Road															
Lane 1		1.191	1.000	28.9	38.7	96.1	NA	NA	37.4	67.9	0.82	2.03	33.4	NA	NA
Lane 2		0.762	1.000	2.0	5.5	13.6	NA	NA	3.8	6.9	0.38	0.95	NA	3.4	1
Approach		1.191			38.7	96.1	NA	NA	37.4	67.9	0.82	2.03			

Intersection	1.701	46.1	114.7	NA	NA	76.5	138.7	0.82	2.03	

Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.

Continuous Lane Performance

Lane Number	Deg. Satn v/c	Unint. Speed mph	Unint. Travel Delay sec	Hdwy sec	Spacing ft	Aver. Vehicle Length ft	Occup. Time sec	Space Time sec	Space Occup. Ratio %	Time Occup. Ratio %	Density veh/mi	Density pc/mi	LOS (Density Method)
South: Farm Road 103													
This approach does not have any continuous lanes													
East: W State Highway M													
This approach does not have any continuous lanes													
North: Farm Road 103													
This approach does not have any continuous lanes													
West: W Republic Road													
This approach does not have any continuous lanes													

Midblock Effective Detection Zone Length = 7 ft

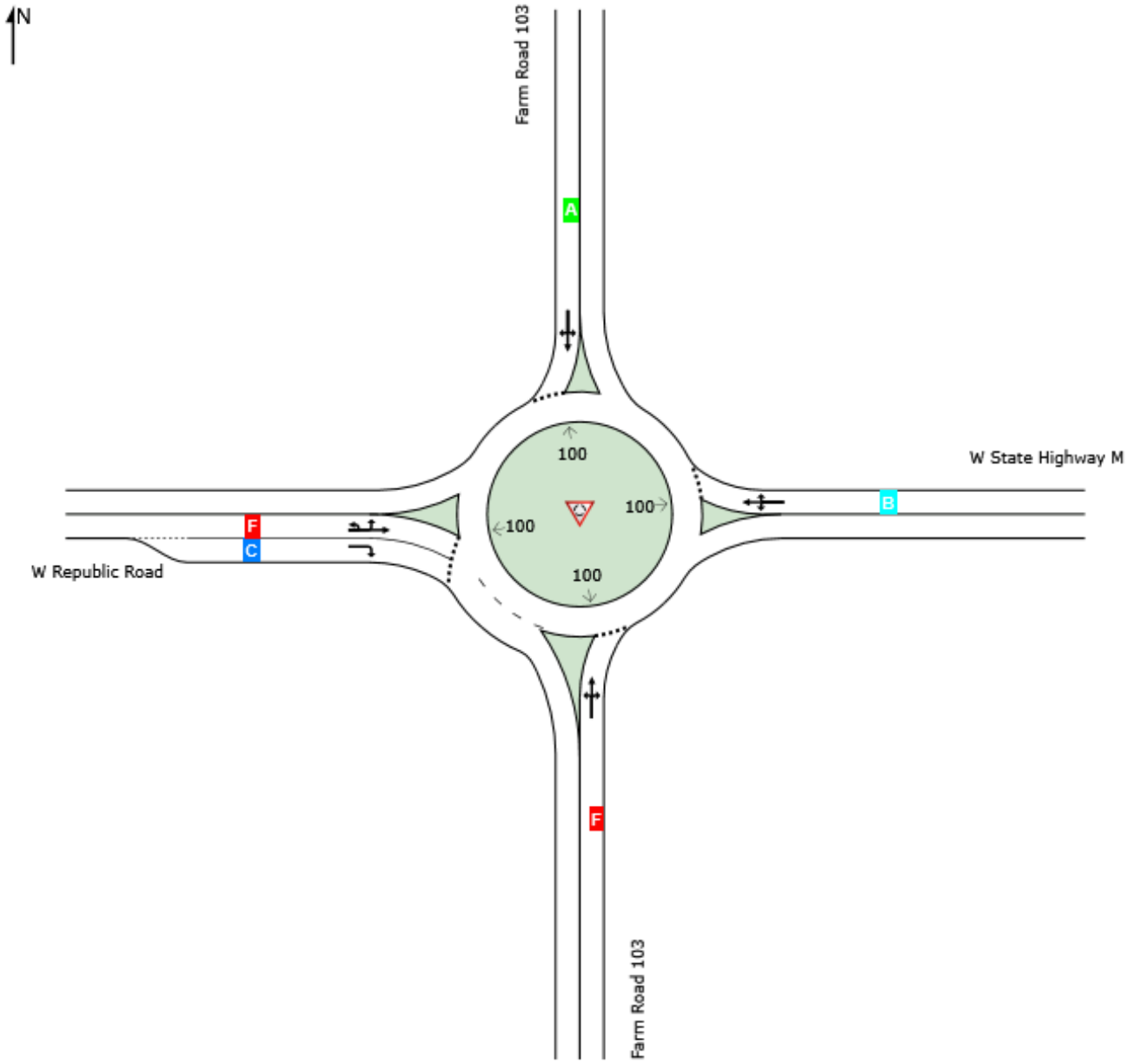
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	F	B	A	F	F



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

QUEUE ANALYSIS

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Queues (Distance)

Lane Number	Contin. Lane	Deg. Satn v/c	Prog. Factor (Queue)	Overflow Queue (ft)	Back of Queue (ft) Av.	Back of Queue (ft) 95%	Queue at Start of Green (ft) Av.	Queue at Start of Green (ft) 95%	Cycle Average Queue (ft) Av.	Cycle Average Queue (ft) 95%	Queue Storage Ratio Av.	Queue Storage Ratio 95%	Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
South: Farm Road 103															
Lane 1		0.888	1.000	90.5	182.9	454.5	NA	NA	163.1	295.9	0.11	0.28	0.0	NA	NA
Approach		0.888			182.9	454.5	NA	NA	163.1	295.9	0.11	0.28			
East: W State Highway M															
Lane 1		1.520	1.000	1331.2	1506.2	3743.4	NA	NA	2126.6	3857.9	0.94	2.34	43.7	NA	NA
Approach		1.520			1506.2	3743.4	NA	NA	2126.6	3857.9	0.94	2.34			
North: Farm Road 103															
Lane 1		0.633	1.000	13.7	37.9	94.2	NA	NA	47.3	85.8	0.02	0.06	0.0	NA	NA
Approach		0.633			37.9	94.2	NA	NA	47.3	85.8	0.02	0.06			
West: W Republic Road															
Lane 1		0.436	1.000	0.0	26.7	66.3	NA	NA	27.8	50.4	0.02	0.06	0.0	NA	NA
Lane 2		0.135	1.000	0.0	5.8	14.5	NA	NA	4.8	8.7	0.02	0.04	NA	0.0	1
Approach		0.436			26.7	66.3	NA	NA	27.8	50.4	0.02	0.06			
Intersection		1.520			1506.2	3743.4	NA	NA	2126.6	3857.9	0.94	2.34			

Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.

Lane Queues (Vehicles)

Lane Number	Contin. Lane	Deg. Satn v/c	Prog. Factor (Queue)	Overflow Queue (veh)	Back of Queue (veh) Av.	Back of Queue (veh) 95%	Queue at Start of Green (veh) Av.	Queue at Start of Green (veh) 95%	Cycle Average Queue (veh) Av.	Cycle Average Queue (veh) 95%	Queue Storage Ratio Av.	Queue Storage Ratio 95%	Prob. Block. %	Prob. SL Ov. %	Ov. Lane No.
South: Farm Road 103															
Lane 1		0.888	1.000	3.6	7.2	17.9	NA	NA	6.4	11.6	0.11	0.28	0.0	NA	NA
Approach		0.888			7.2	17.9	NA	NA	6.4	11.6	0.11	0.28			
East: W State Highway M															
Lane 1		1.520	1.000	52.4	59.3	147.4	NA	NA	83.7	151.9	0.94	2.34	43.7	NA	NA
Approach		1.520			59.3	147.4	NA	NA	83.7	151.9	0.94	2.34			
North: Farm Road 103															
Lane 1		0.633	1.000	0.5	1.5	3.7	NA	NA	1.9	3.4	0.02	0.06	0.0	NA	NA
Approach		0.633			1.5	3.7	NA	NA	1.9	3.4	0.02	0.06			
West: W Republic Road															
Lane 1		0.436	1.000	0.0	1.0	2.6	NA	NA	1.1	2.0	0.02	0.06	0.0	NA	NA
Lane 2		0.135	1.000	0.0	0.2	0.6	NA	NA	0.2	0.3	0.02	0.04	NA	0.0	1
Approach		0.436			1.0	2.6	NA	NA	1.1	2.0	0.02	0.06			

Intersection	1.520	59.3	147.4	NA	NA	83.7	151.9	0.94	2.34	

Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.

Continuous Lane Performance

Lane Number	Deg. Satn v/c	Unint. Speed mph	Unint. Travel Delay sec	Hdwy sec	Spacing ft	Aver. Vehicle Length ft	Occup. Time sec	Space Time sec	Space Occup. Ratio %	Time Occup. Ratio %	Density veh/mi	Density pc/mi	LOS (Density Method)
South: Farm Road 103													
This approach does not have any continuous lanes													
East: W State Highway M													
This approach does not have any continuous lanes													
North: Farm Road 103													
This approach does not have any continuous lanes													
West: W Republic Road													
This approach does not have any continuous lanes													

Midblock Effective Detection Zone Length = 7 ft

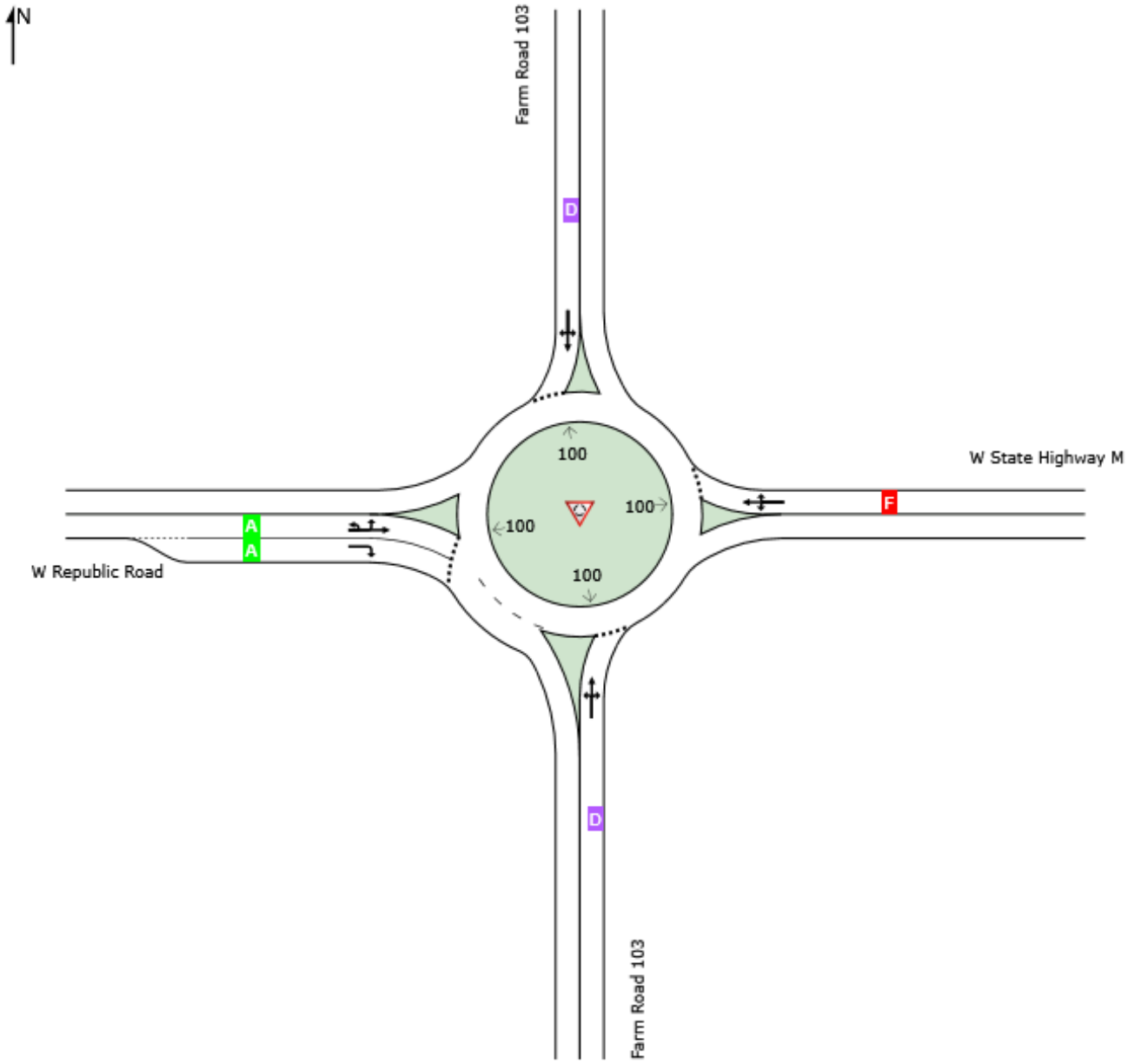
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	D	F	D	A	F



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

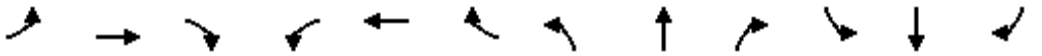
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	36	36	126	137	65	1215	65	22	630	174
v/c Ratio	0.83	0.38	0.17	0.70	1.13	0.14	1.02	0.06	0.19	0.59	0.18
Control Delay	111.0	80.8	1.7	80.2	165.5	3.1	44.5	0.1	8.2	17.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.0	80.8	1.7	80.2	165.5	3.1	44.5	0.1	8.2	17.2	2.2
Queue Length 50th (ft)	75	35	0	113	~120	8	~1321	0	4	446	15
Queue Length 95th (ft)	#123	69	0	#210	#251	m3	#1588	m0	m6	m538	m25
Internal Link Dist (ft)		485			2182		548			2133	
Turn Bay Length (ft)	150		85	175		250		240	200		240
Base Capacity (vph)	101	96	215	179	121	461	1191	1121	118	1068	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38	0.17	0.70	1.13	0.14	1.02	0.06	0.19	0.59	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	30	30	110	50	70	60	1130	60	20	580	160
Future Volume (vph)	70	30	30	110	50	70	60	1130	60	20	580	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1357	1863	1455	1687	1494		1703	1759	1583	1583	1624	1357
Flt Permitted	0.46	1.00	1.00	0.73	1.00		0.33	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	653	1863	1455	1303	1494		589	1759	1583	69	1624	1357
Peak-hour factor, PHF	0.83	0.83	0.83	0.87	0.87	0.87	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	84	36	36	126	57	80	65	1215	65	22	630	174
RTOR Reduction (vph)	0	0	35	0	34	0	0	0	23	0	0	63
Lane Group Flow (vph)	84	36	1	126	103	0	65	1215	42	22	630	111
Heavy Vehicles (%)	33%	2%	11%	7%	2%	26%	6%	8%	2%	14%	17%	19%
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8			6		2	2		6
Actuated Green, G (s)	17.4	6.2	6.2	17.4	10.4		101.2	97.0	97.0	101.2	95.5	95.5
Effective Green, g (s)	17.4	6.2	6.2	17.4	10.4		101.2	97.0	97.0	101.2	95.5	95.5
Actuated g/C Ratio	0.12	0.04	0.04	0.12	0.07		0.67	0.65	0.65	0.67	0.64	0.64
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	108	77	60	179	103		439	1137	1023	88	1033	863
v/s Ratio Prot	0.04	0.02		c0.05	c0.07		0.01	c0.69		c0.01	0.39	
v/s Ratio Perm	0.05		0.00	0.03			0.09		0.03	0.16		0.08
v/c Ratio	0.78	0.47	0.02	0.70	1.00		0.15	1.07	0.04	0.25	0.61	0.13
Uniform Delay, d1	63.2	70.3	69.0	63.3	69.8		10.0	26.5	9.6	37.3	16.2	10.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.49	0.78	1.00	0.92	0.98	1.30
Incremental Delay, d2	29.6	5.2	0.2	12.3	90.0		0.1	40.4	0.0	1.5	2.2	0.3
Delay (s)	92.8	75.5	69.2	75.6	159.8		5.0	61.0	9.7	35.8	18.1	14.3
Level of Service	F	E	E	E	F		A	E	A	D	B	B
Approach Delay (s)		83.4			119.5			55.8			17.7	
Approach LOS		F			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	140	0	0	0	0	1010	100	525	530	0
Future Vol, veh/h	20	0	140	0	0	0	0	1010	100	525	530	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	25	-	-	-	-	-	-	-	270	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	25	78	100	100	100	100	92	92	92	92	100
Heavy Vehicles, %	2	2	34	2	2	2	2	10	15	6	11	2
Mvmt Flow	26	0	179	0	0	0	0	1098	109	571	576	0

Major/Minor	Minor2				Major1			Major2		
Conflicting Flow All	2816	2816	576		-	0	0	1098	0	0
Stage 1	1718	1718	-		-	-	-	-	-	-
Stage 2	1098	1098	-		-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.54		-	-	-	4.16	-	-
Critical Hdwy Stg 1	5.42	5.52	-		-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-		-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.606		-	-	-	2.254	-	-
Pot Cap-1 Maneuver	~ 20	18	461		0	-	-	621	-	0
Stage 1	159	145	-		0	-	-	-	-	0
Stage 2	319	289	-		0	-	-	-	-	0
Platoon blocked, %						-	-		-	
Mov Cap-1 Maneuver	~ 2	0	461		-	-	-	621	-	-
Mov Cap-2 Maneuver	203	0	-		-	-	-	-	-	-
Stage 1	159	0	-		-	-	-	-	-	-
Stage 2	26	0	-		-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0	22.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	203	527	621	-
HCM Lane V/C Ratio	-	-	0.126	0.341	0.919	-
HCM Control Delay (s)	-	-	25.3	15.3	44.8	-
HCM Lane LOS	-	-	D	C	E	-
HCM 95th %tile Q(veh)	-	-	0.4	1.5	11.8	-

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

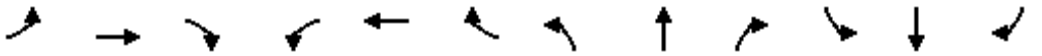
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	184	471	217	880	870	20
v/c Ratio	0.56	0.99	1.06	0.72	0.97	0.02
Control Delay	61.7	70.2	99.3	7.7	60.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	70.2	99.3	7.7	60.5	0.1
Queue Length 50th (ft)	165	287	~193	153	804	0
Queue Length 95th (ft)	240	#488	m#193	m157	#1109	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	250		250			
Base Capacity (vph)	326	478	204	1237	901	848
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.99	1.06	0.71	0.97	0.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

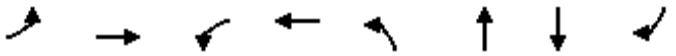
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	160	0	410	200	810	0	0	800	10
Future Volume (vph)	0	0	0	160	0	410	200	810	0	0	800	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		1.00	1.00	1.00			1.00	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1612		1538	1195	1776			1776	1583
Flt Permitted				0.95		1.00	0.06	1.00			1.00	1.00
Satd. Flow (perm)				1612		1538	75	1776			1776	1583
Peak-hour factor, PHF	1.00	1.00	1.00	0.87	1.00	0.87	0.92	0.92	1.00	1.00	0.92	0.50
Adj. Flow (vph)	0	0	0	184	0	471	217	880	0	0	870	20
RTOR Reduction (vph)	0	0	0	0	0	167	0	0	0	0	0	10
Lane Group Flow (vph)	0	0	0	184	0	304	217	880	0	0	870	10
Heavy Vehicles (%)	2%	2%	2%	12%	2%	5%	51%	7%	2%	2%	7%	2%
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				30.4		30.4	96.4	103.9			75.5	75.5
Effective Green, g (s)				30.4		30.4	96.4	103.9			75.5	75.5
Actuated g/C Ratio				0.20		0.20	0.64	0.69			0.50	0.50
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				326		311	204	1230			893	796
v/s Ratio Prot				0.11			c0.15	0.50			0.49	
v/s Ratio Perm						c0.20	c0.53					0.01
v/c Ratio				0.56		0.98	1.06	0.72			0.97	0.01
Uniform Delay, d1				53.8		59.5	51.4	14.0			36.3	18.6
Progression Factor				1.00		1.00	1.16	0.47			1.00	1.00
Incremental Delay, d2				2.4		44.8	49.4	0.9			24.5	0.0
Delay (s)				56.3		104.3	108.9	7.5			60.8	18.6
Level of Service				E		F	F	A			E	B
Approach Delay (s)		0.0			90.8			27.5			59.8	
Approach LOS		A			F			C			E	

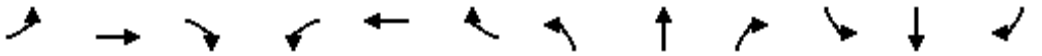
Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	20	31	12	15	66	1355	620	40
v/c Ratio	0.17	0.07	0.10	0.06	0.11	0.88	0.50	0.03
Control Delay	62.4	0.3	60.0	0.5	7.1	27.3	9.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	0.3	60.0	0.5	7.1	27.3	9.0	0.0
Queue Length 50th (ft)	19	0	12	0	15	946	117	0
Queue Length 95th (ft)	28	0	9	0	m30	m676	334	m0
Internal Link Dist (ft)		347		749		490	984	
Turn Bay Length (ft)			30		200			240
Base Capacity (vph)	117	459	115	246	602	1542	1247	1270
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.07	0.10	0.06	0.11	0.88	0.50	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	18	3	0	11	53	1250	4	0	570	32
Future Volume (vph)	12	0	18	3	0	11	53	1250	4	0	570	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	1774			1597	1583
Flt Permitted	1.00	1.00		0.95	1.00		0.37	1.00			1.00	1.00
Satd. Flow (perm)	1863	1583		1774	1583		682	1774			1597	1583
Peak-hour factor, PHF	0.59	0.59	0.59	0.25	0.80	0.75	0.80	0.93	0.38	0.92	0.92	0.80
Adj. Flow (vph)	20	0	31	12	0	15	66	1344	11	0	620	40
RTOR Reduction (vph)	0	30	0	0	15	0	0	0	0	0	0	12
Lane Group Flow (vph)	20	1	0	12	0	0	66	1355	0	0	620	28
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	19%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	7.0	4.2		7.0	2.8		111.6	119.1			106.0	106.0
Effective Green, g (s)	7.0	4.2		7.0	2.8		111.6	119.1			106.0	106.0
Actuated g/C Ratio	0.05	0.03		0.05	0.02		0.74	0.79			0.71	0.71
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)	84	44		82	29		548	1408			1128	1118
v/s Ratio Prot	c0.01	0.00		0.00	0.00		0.00	c0.76			0.39	
v/s Ratio Perm	c0.00			0.00			0.09					0.02
v/c Ratio	0.24	0.02		0.15	0.01		0.12	0.96			0.55	0.03
Uniform Delay, d1	68.9	70.9		68.6	72.2		6.0	13.5			10.6	6.6
Progression Factor	1.00	1.00		1.00	1.00		1.84	2.29			0.79	1.00
Incremental Delay, d2	1.7	0.2		1.0	0.2		0.1	9.5			1.6	0.0
Delay (s)	70.7	71.1		69.6	72.4		11.1	40.4			9.9	6.6
Level of Service	E	E		E	E		B	D			A	A
Approach Delay (s)		70.9			71.2			39.1			9.7	
Approach LOS		E			E			D			A	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	15.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	20	30	1260	540	20
Future Vol, veh/h	40	20	30	1260	540	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	240
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	50	93	93	92	92
Heavy Vehicles, %	2	2	2	6	18	20
Mvmt Flow	70	40	32	1355	587	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2006	587	609	0	-	0
Stage 1	587	-	-	-	-	-
Stage 2	1419	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 65	510	970	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 56	510	970	-	-	-
Mov Cap-2 Maneuver	~ 56	-	-	-	-	-
Stage 1	482	-	-	-	-	-
Stage 2	223	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	299.1	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	970	-	83	-	-
HCM Lane V/C Ratio	0.033	-	1.327	-	-
HCM Control Delay (s)	8.8	0	299.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	8.3	-	-

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

Intersection	
Int Delay, s/veh	261.5

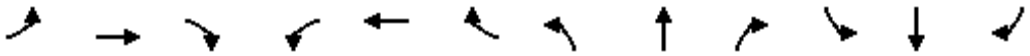
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	120	310	100	1100	460	30
Future Vol, veh/h	120	310	100	1100	460	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	93	93	87	87
Heavy Vehicles, %	7	8	9	6	12	2
Mvmt Flow	138	356	108	1183	529	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1945	546	563	0	-	0
Stage 1	546	-	-	-	-	-
Stage 2	1399	-	-	-	-	-
Critical Hdwy	6.47	6.28	4.19	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.372	2.281	-	-	-
Pot Cap-1 Maneuver	~ 69	526	974	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 47	526	974	-	-	-
Mov Cap-2 Maneuver	~ 47	-	-	-	-	-
Stage 1	387	-	-	-	-	-
Stage 2	223	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1240	0.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	137	-	-
HCM Lane V/C Ratio	0.11	-	3.608	-	-
HCM Control Delay (s)	9.2	0	$ 1240	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.4	-	48.5	-	-

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



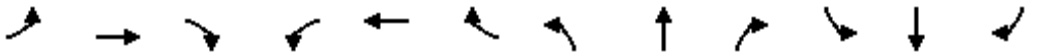
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	589	2347	295	32	925	172	359	380	130	261	315	250
v/c Ratio	1.43	0.91	0.34	0.29	0.63	0.30	1.37	1.33	0.33	1.07	1.22	0.73
Control Delay	245.8	21.4	4.0	85.8	60.2	19.4	223.9	217.0	4.7	123.1	183.2	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	245.8	21.4	4.0	85.8	60.2	19.4	223.9	217.0	4.7	123.1	183.2	40.9
Queue Length 50th (ft)	~771	605	34	33	342	28	~416	~480	0	~236	~382	75
Queue Length 95th (ft)	#1016	#960	m62	73	392	133	#625	#689	23	#424	#575	186
Internal Link Dist (ft)		3066			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	412	2592	868	141	1471	575	262	286	390	244	259	341
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.43	0.91	0.34	0.23	0.63	0.30	1.37	1.33	0.33	1.07	1.22	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

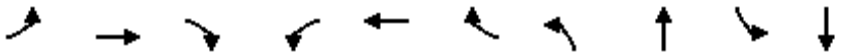
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	560	2230	280	30	860	160	330	350	120	240	290	250
Future Volume (vph)	560	2230	280	30	860	160	330	350	120	240	290	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	5036	1538	1770	4893	1495	1687	1863	1583	1719	1845	1369
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.19	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1719	5036	1538	1770	4893	1495	337	1863	1583	313	1845	1369
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	1.00
Adj. Flow (vph)	589	2347	295	32	925	172	359	380	130	261	315	250
RTOR Reduction (vph)	0	0	80	0	0	120	0	0	110	0	0	149
Lane Group Flow (vph)	589	2347	215	32	925	52	359	380	20	261	315	101
Heavy Vehicles (%)	5%	3%	5%	2%	6%	8%	7%	2%	2%	5%	3%	18%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2	2		6
Actuated Green, G (s)	36.0	74.8	74.8	6.3	45.1	45.1	40.2	23.1	23.1	40.2	21.1	21.1
Effective Green, g (s)	36.0	74.8	74.8	6.3	45.1	45.1	40.2	23.1	23.1	40.2	21.1	21.1
Actuated g/C Ratio	0.24	0.50	0.50	0.04	0.30	0.30	0.27	0.15	0.15	0.27	0.14	0.14
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	412	2511	766	74	1471	449	262	286	243	244	259	192
v/s Ratio Prot	c0.34	c0.47		0.02	0.19		c0.17	c0.20		0.12	0.17	
v/s Ratio Perm			0.14			0.03	0.19		0.01	0.16		0.07
v/c Ratio	1.43	0.93	0.28	0.43	0.63	0.12	1.37	1.33	0.08	1.07	1.22	0.53
Uniform Delay, d1	57.0	35.3	21.9	70.1	45.2	38.0	49.5	63.5	54.4	49.2	64.5	59.8
Progression Factor	1.15	0.49	0.32	1.19	1.28	4.03	1.00	1.00	1.00	1.16	1.11	1.40
Incremental Delay, d2	201.1	4.9	0.5	5.4	2.0	0.5	189.0	170.0	0.2	76.7	126.7	9.8
Delay (s)	266.8	22.4	7.6	88.5	59.9	153.7	238.5	233.5	54.6	133.6	198.3	93.6
Level of Service	F	C	A	F	E	F	F	F	D	F	F	F
Approach Delay (s)		65.6			75.0			208.8			146.2	
Approach LOS		E			E			F			F	

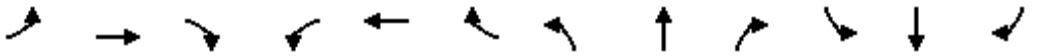
Intersection Summary			
HCM 2000 Control Delay	98.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.7
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	2842	24	70	995	32	11	164	86	49
v/c Ratio	0.36	0.81	0.02	0.54	0.28	0.03	0.05	0.70	0.49	0.19
Control Delay	80.8	7.5	0.0	75.5	9.2	0.0	49.2	26.6	62.9	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.8	7.5	0.0	75.5	9.2	0.0	49.2	26.6	62.9	27.3
Queue Length 50th (ft)	37	142	0	67	117	0	9	7	76	14
Queue Length 95th (ft)	m44	m165	m0	121	185	0	25	61	103	43
Internal Link Dist (ft)		3132			3156			809		736
Turn Bay Length (ft)	400		410	385		385	150		150	
Base Capacity (vph)	145	3497	1122	143	3575	1145	218	329	220	349
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.81	0.02	0.49	0.28	0.03	0.05	0.50	0.39	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	2700	23	65	925	30	9	6	130	67	13	25
Future Volume (vph)	34	2700	23	65	925	30	9	6	130	67	13	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1595		1770	1680	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.37	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1351	1595		684	1680	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.83	0.83	0.83	0.78	0.78	0.78
Adj. Flow (vph)	36	2842	24	70	995	32	11	7	157	86	17	32
RTOR Reduction (vph)	0	0	8	0	0	10	0	146	0	0	28	0
Lane Group Flow (vph)	36	2842	16	70	995	22	11	18	0	86	21	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6			2		
Actuated Green, G (s)	7.4	99.6	99.6	9.7	101.9	101.9	22.7	10.9		22.7	20.7	
Effective Green, g (s)	7.4	99.6	99.6	9.7	101.9	101.9	22.7	10.9		22.7	20.7	
Actuated g/C Ratio	0.05	0.66	0.66	0.06	0.68	0.68	0.15	0.07		0.15	0.14	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	87	3376	1051	114	3454	1075	210	115		188	231	
v/s Ratio Prot	0.02	c0.56		c0.04	0.20		0.00	0.01		c0.04	0.01	
v/s Ratio Perm			0.01			0.01	0.01			c0.03		
v/c Ratio	0.41	0.84	0.02	0.61	0.29	0.02	0.05	0.16		0.46	0.09	
Uniform Delay, d1	69.2	19.2	8.6	68.3	9.6	7.8	54.4	65.3		56.9	56.5	
Progression Factor	1.12	0.29	1.00	0.92	0.96	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.5	0.0	9.2	0.2	0.0	0.1	0.7		1.8	0.2	
Delay (s)	79.1	7.1	8.6	71.9	9.4	7.9	54.5	65.9		58.7	56.6	
Level of Service	E	A	A	E	A	A	D	E		E	E	
Approach Delay (s)		8.0			13.3			65.2			58.0	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	554	228	218	333	430	1011
v/c Ratio	0.84	0.35	0.69	0.31	0.87	1.16
Control Delay	45.5	7.9	53.5	11.5	58.4	101.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	7.9	53.5	11.5	58.4	101.9
Queue Length 50th (ft)	348	18	145	107	290	~523
Queue Length 95th (ft)	#587	79	217	149	#518	#821
Internal Link Dist (ft)	1544			1207	1360	
Turn Bay Length (ft)		260	475		230	230
Base Capacity (vph)	691	678	650	1452	492	870
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.34	0.34	0.23	0.87	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	510	210	190	290	400	940
Future Volume (vph)	510	210	190	290	400	940
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1509	1752	1810	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1509	1752	1810	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.93	0.93
Adj. Flow (vph)	554	228	218	333	430	1011
RTOR Reduction (vph)	0	121	0	0	0	430
Lane Group Flow (vph)	554	107	218	333	430	581
Heavy Vehicles (%)	2%	7%	3%	5%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	8		7	4	2	
Permitted Phases		8				2
Actuated Green, G (s)	38.5	38.5	19.6	64.6	30.1	30.1
Effective Green, g (s)	38.5	38.5	19.6	64.6	30.1	30.1
Actuated g/C Ratio	0.36	0.36	0.18	0.60	0.28	0.28
Clearance Time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	3.5	3.5
Lane Grp Cap (vph)	662	536	317	1080	492	440
v/s Ratio Prot	c0.30		c0.12	0.18	0.24	
v/s Ratio Perm		0.07				c0.37
v/c Ratio	0.84	0.20	0.69	0.31	0.87	1.32
Uniform Delay, d1	32.0	24.2	41.4	10.8	37.2	39.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	0.3	6.6	0.2	16.1	159.3
Delay (s)	41.4	24.4	48.0	11.0	53.3	198.3
Level of Service	D	C	D	B	D	F
Approach Delay (s)	36.4			25.6	155.0	
Approach LOS	D			C	F	

Intersection Summary			
HCM 2000 Control Delay	95.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

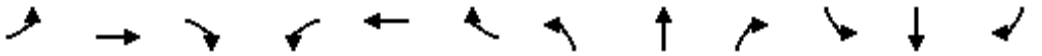
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	24	48	133	108	12	807	96	33	1620	54
v/c Ratio	1.06	0.28	0.22	0.78	0.99	0.09	0.69	0.09	0.09	1.24	0.06
Control Delay	159.7	77.5	2.4	90.6	132.6	7.2	23.0	0.8	2.8	130.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	159.7	77.5	2.4	90.6	132.6	7.2	23.0	0.8	2.8	130.7	0.1
Queue Length 50th (ft)	~118	23	0	122	77	3	702	2	4	~1910	0
Queue Length 95th (ft)	#190	51	0	#223	#182	m5	509	m6	m6	m#2136	m0
Internal Link Dist (ft)		485			2182		548			2133	
Turn Bay Length (ft)	150		85	175		250		240	200		240
Base Capacity (vph)	113	86	214	170	109	133	1178	1090	365	1307	844
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.28	0.22	0.78	0.99	0.09	0.69	0.09	0.09	1.24	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	20	40	110	40	50	10	670	80	30	1490	50
Future Volume (vph)	100	20	40	110	40	50	10	670	80	30	1490	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1467	1863	1583	1770	1708		1770	1759	1553	1770	1845	1129
Flt Permitted	0.62	1.00	1.00	0.74	1.00		0.04	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	960	1863	1583	1381	1708		74	1759	1553	429	1845	1129
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	120	24	48	133	48	60	12	807	96	33	1620	54
RTOR Reduction (vph)	0	0	46	0	29	0	0	0	34	0	0	18
Lane Group Flow (vph)	120	24	2	133	79	0	12	807	62	33	1620	36
Heavy Vehicles (%)	23%	2%	2%	2%	2%	2%	2%	8%	4%	2%	3%	43%
Turn Type	D.P+P	NA	Perm	D.P+P	NA		D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8			6		2	2		6
Actuated Green, G (s)	15.6	5.6	5.6	15.6	8.6		103.0	97.4	97.4	103.0	100.2	100.2
Effective Green, g (s)	15.6	5.6	5.6	15.6	8.6		103.0	97.4	97.4	103.0	100.2	100.2
Actuated g/C Ratio	0.10	0.04	0.04	0.10	0.06		0.69	0.65	0.65	0.69	0.67	0.67
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	123	69	59	169	97		82	1142	1008	344	1232	754
v/s Ratio Prot	0.05	0.01		c0.05	0.05		0.00	0.46		c0.00	c0.88	
v/s Ratio Perm	c0.06		0.00	0.03			0.10		0.04	0.06		0.03
v/c Ratio	0.98	0.35	0.03	0.79	0.81		0.15	0.71	0.06	0.10	1.31	0.05
Uniform Delay, d1	66.3	70.4	69.6	65.1	69.9		38.5	17.0	9.6	11.9	24.9	8.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.19	1.23	5.98	0.47	0.61	1.00
Incremental Delay, d2	73.2	3.6	0.2	21.6	39.2		0.9	3.3	0.1	0.1	146.1	0.1
Delay (s)	139.5	74.0	69.8	86.7	109.1		46.5	24.1	57.5	5.7	161.2	8.6
Level of Service	F	E	E	F	F		D	C	E	A	F	A
Approach Delay (s)		113.9			96.8			27.9			153.3	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	108.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	110.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	13.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	200	0	0	0	0	560	150	348	1140	0
Future Vol, veh/h	20	0	200	0	0	0	0	560	150	348	1140	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	25	-	-	-	-	-	-	-	270	275	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	100	87	100	100	100	100	92	92	93	93	100
Heavy Vehicles, %	33	2	17	2	2	2	2	9	8	2	2	2
Mvmt Flow	23	0	230	0	0	0	0	609	163	374	1226	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	2583	2583	1226				-	0	0	609	0	0
Stage 1	1974	1974	-				-	-	-	-	-	-
Stage 2	609	609	-				-	-	-	-	-	-
Critical Hdwy	6.73	6.52	6.37				-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.73	5.52	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.73	5.52	-				-	-	-	-	-	-
Follow-up Hdwy	3.797	4.018	3.453				-	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 22	25	~ 203				0	-	-	970	-	0
Stage 1	97	108	-				0	-	-	-	-	0
Stage 2	487	485	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	~ 14	0	~ 203				-	-	-	970	-	-
Mov Cap-2 Maneuver	1137	0	-				-	-	-	-	-	-
Stage 1	97	0	-				-	-	-	-	-	-
Stage 2	299	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	126	0	2.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	1137	210	970	-
HCM Lane V/C Ratio	-	-	0.02	1.095	0.386	-
HCM Control Delay (s)	-	-	8.2	137.8	11	-
HCM Lane LOS	-	-	A	F	B	-
HCM 95th %tile Q(veh)	-	-	0.1	10.6	1.8	-

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

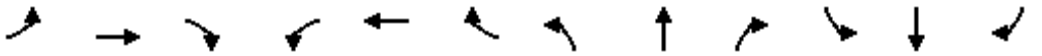
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	217	663	138	414	1247	40
v/c Ratio	0.91	0.97	1.03	0.32	1.04	0.06
Control Delay	101.7	39.5	122.0	10.3	65.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.7	39.5	122.0	10.3	65.1	0.1
Queue Length 50th (ft)	211	145	~91	201	~1324	0
Queue Length 95th (ft)	#364	#415	m#201	m204	#1592	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	250		250			
Base Capacity (vph)	245	690	134	1311	1195	724
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.96	1.03	0.32	1.04	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	0	610	120	360	0	0	1160	10
Future Volume (vph)	0	0	0	200	0	610	120	360	0	0	1160	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		1.00	1.00	1.00			1.00	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1671		1583	1517	1743			1863	1077
Flt Permitted				0.95		1.00	0.04	1.00			1.00	1.00
Satd. Flow (perm)				1671		1583	66	1743			1863	1077
Peak-hour factor, PHF	1.00	1.00	1.00	0.92	1.00	0.92	0.87	0.87	1.00	1.00	0.93	0.25
Adj. Flow (vph)	0	0	0	217	0	663	138	414	0	0	1247	40
RTOR Reduction (vph)	0	0	0	0	0	460	0	0	0	0	0	14
Lane Group Flow (vph)	0	0	0	217	0	203	138	414	0	0	1247	26
Heavy Vehicles (%)	2%	2%	2%	8%	2%	2%	19%	9%	2%	2%	2%	50%
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				21.4		21.4	105.4	112.9			96.3	96.3
Effective Green, g (s)				21.4		21.4	105.4	112.9			96.3	96.3
Actuated g/C Ratio				0.14		0.14	0.70	0.75			0.64	0.64
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				238		225	134	1311			1196	691
v/s Ratio Prot				c0.13			c0.06	0.24			c0.67	
v/s Ratio Perm						0.13	0.66					0.02
v/c Ratio				0.91		0.90	1.03	0.32			1.04	0.04
Uniform Delay, d1				63.4		63.3	67.1	6.0			26.9	9.8
Progression Factor				1.00		1.00	1.07	1.59			1.00	1.00
Incremental Delay, d2				35.9		35.0	71.9	0.4			37.8	0.1
Delay (s)				99.3		98.2	143.6	10.0			64.7	9.9
Level of Service				F		F	F	A			E	A
Approach Delay (s)		0.0			98.5			43.4			63.0	
Approach LOS		A			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	70.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	151	16	16	67	757	11	1707	40
v/c Ratio	0.89	0.71	0.16	0.05	0.49	0.57	0.02	1.27	0.03
Control Delay	123.5	28.6	62.2	0.2	29.8	12.2	2.0	136.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	123.5	28.6	62.2	0.2	29.8	12.2	2.0	136.4	0.0
Queue Length 50th (ft)	~127	3	15	0	25	176	1	~2108	0
Queue Length 95th (ft)	81	0	21	0	m47	m253	m1	m#1724	m0
Internal Link Dist (ft)		347		749		490		984	
Turn Bay Length (ft)			30		200		250		240
Base Capacity (vph)	117	214	102	349	136	1327	484	1347	1197
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.71	0.16	0.05	0.49	0.57	0.02	1.27	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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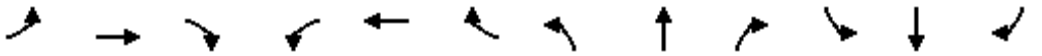


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	0	74	8	0	8	55	650	5	4	1570	33
Future Volume (vph)	51	0	74	8	0	8	55	650	5	4	1570	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1380		1770	1726		1770	1845	1583
Flt Permitted	1.00	1.00		0.57	1.00		0.04	1.00		0.29	1.00	1.00
Satd. Flow (perm)	1863	1583		1064	1380		72	1726		542	1845	1583
Peak-hour factor, PHF	0.49	0.49	0.49	0.50	0.82	0.50	0.82	0.87	0.50	0.38	0.92	0.82
Adj. Flow (vph)	104	0	151	16	0	16	67	747	10	11	1707	40
RTOR Reduction (vph)	0	141	0	0	16	0	0	0	0	0	0	13
Lane Group Flow (vph)	104	10	0	16	0	0	67	757	0	11	1707	27
Heavy Vehicles (%)	2%	2%	2%	2%	2%	17%	2%	10%	2%	2%	3%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	9.8	7.0		9.8	2.8		108.8	106.0		108.8	103.1	103.1
Effective Green, g (s)	9.8	7.0		9.8	2.8		108.8	106.0		108.8	103.1	103.1
Actuated g/C Ratio	0.07	0.05		0.07	0.02		0.73	0.71		0.73	0.69	0.69
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	4.0
Lane Grp Cap (vph)	117	73		82	25		116	1219		416	1268	1088
v/s Ratio Prot	c0.04	0.01		0.00	0.00		c0.02	c0.44		0.00	c0.93	
v/s Ratio Perm	c0.02			c0.01			0.39			0.02		0.02
v/c Ratio	0.89	0.14		0.20	0.01		0.58	0.62		0.03	1.35	0.03
Uniform Delay, d1	69.4	68.6		66.1	72.2		39.8	11.5		7.7	23.5	7.5
Progression Factor	1.00	1.00		1.00	1.00		1.11	1.08		0.43	0.43	1.00
Incremental Delay, d2	50.6	1.0		1.4	0.2		4.9	1.6		0.0	156.3	0.0
Delay (s)	120.1	69.6		67.5	72.5		49.2	14.0		3.3	166.3	7.5
Level of Service	F	E		E	E		D	B		A	F	A
Approach Delay (s)		90.2			70.0			16.9			161.6	
Approach LOS		F			E			B			F	

Intersection Summary			
HCM 2000 Control Delay	112.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	50.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	40	30	670	1620	40
Future Vol, veh/h	30	40	30	670	1620	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	240
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	49	87	87	92	92
Heavy Vehicles, %	2	2	2	6	3	2
Mvmt Flow	48	82	34	770	1761	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2599	1761	1804	0	-	0
Stage 1	1761	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 27	105	341	-	-	-
Stage 1	151	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 22	105	341	-	-	-
Mov Cap-2 Maneuver	~ 22	-	-	-	-	-
Stage 1	125	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	1068.8	0.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	341	-	44	-	-
HCM Lane V/C Ratio	0.101	-	2.938	-	-
HCM Control Delay (s)	16.7	$	1068.8	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	14.1	-	-

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

Intersection	
Int Delay, s/veh	918.3

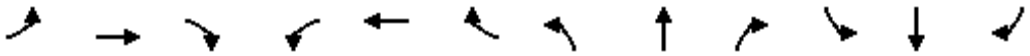
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	230	190	610	1370	170
Future Vol, veh/h	40	230	190	610	1370	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	92	92	93	83
Heavy Vehicles, %	11	4	4	4	2	2
Mvmt Flow	48	277	207	663	1473	205

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2653	1576	1678	0	-	0
Stage 1	1576	-	-	-	-	-
Stage 2	1077	-	-	-	-	-
Critical Hdwy	6.51	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	~ 24	~ 134	376	-	-	-
Stage 1	178	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 3	~ 134	376	-	-	-
Mov Cap-2 Maneuver	~ 3	-	-	-	-	-
Stage 1	~ 23	-	-	-	-	-
Stage 2	314	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	8093.7	6.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	376	-	18	-	-
HCM Lane V/C Ratio	0.549	-	18.072	-	-
HCM Control Delay (s)	25.6	$	8093.7	-	-
HCM Lane LOS	D	A	F	-	-
HCM 95th %tile Q(veh)	3.2	-	41.4	-	-

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



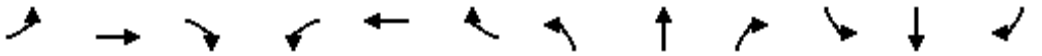
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	376	1398	301	97	2581	247	287	218	80	226	441	817
v/c Ratio	1.59	0.67	0.38	0.62	1.41	0.38	1.49	0.60	0.19	0.65	1.04	1.57
Control Delay	329.4	31.5	9.2	93.0	214.0	7.1	278.4	63.3	1.9	43.3	95.4	292.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	329.4	31.5	9.2	93.0	214.0	7.1	278.4	63.3	1.9	43.3	95.4	292.2
Queue Length 50th (ft)	~536	195	17	97	~1244	48	~338	198	0	199	~473	~991
Queue Length 95th (ft)	#751	341	131	m127	#1313	m81	#507	279	2	m179	m404	m#795
Internal Link Dist (ft)		3066			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	236	2076	796	177	1833	658	192	362	412	357	423	519
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.59	0.67	0.38	0.55	1.41	0.38	1.49	0.60	0.19	0.63	1.04	1.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

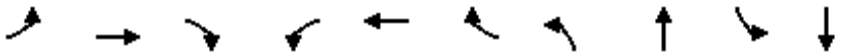
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	1300	280	90	2400	230	250	190	70	210	410	760
Future Volume (vph)	350	1300	280	90	2400	230	250	190	70	210	410	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	5036	1583	1770	5085	1583	1770	1863	1583	1719	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.12	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	1687	5036	1583	1770	5085	1583	219	1863	1583	788	1863	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.87	0.87	0.87	0.93	0.93	0.93
Adj. Flow (vph)	376	1398	301	97	2581	247	287	218	80	226	441	817
RTOR Reduction (vph)	0	0	144	0	0	88	0	0	64	0	0	159
Lane Group Flow (vph)	376	1398	157	97	2581	159	287	218	16	226	441	658
Heavy Vehicles (%)	7%	3%	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2	2		6
Actuated Green, G (s)	21.0	61.9	61.9	13.2	54.1	54.1	46.2	29.2	29.2	46.2	34.1	34.1
Effective Green, g (s)	21.0	61.9	61.9	13.2	54.1	54.1	46.2	29.2	29.2	46.2	34.1	34.1
Actuated g/C Ratio	0.14	0.41	0.41	0.09	0.36	0.36	0.31	0.19	0.19	0.31	0.23	0.23
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	236	2078	653	155	1833	570	192	362	308	348	423	359
v/s Ratio Prot	c0.22	0.28		0.05	c0.51		c0.12	0.12		0.07	0.24	
v/s Ratio Perm			0.10			0.10	0.34		0.01	0.13		c0.42
v/c Ratio	1.59	0.67	0.24	0.63	1.41	0.28	1.49	0.60	0.05	0.65	1.04	1.83
Uniform Delay, d1	64.5	35.8	28.7	66.0	48.0	34.1	44.6	55.1	49.1	41.7	58.0	58.0
Progression Factor	1.28	0.83	1.24	1.20	0.63	0.38	1.00	1.00	1.00	1.11	1.11	1.23
Incremental Delay, d2	283.0	1.5	0.7	7.0	186.3	1.0	248.1	3.3	0.1	1.2	35.0	377.6
Delay (s)	365.3	31.1	36.2	86.2	216.7	14.0	292.7	58.4	49.2	47.4	99.5	448.9
Level of Service	F	C	D	F	F	B	F	E	D	D	F	F
Approach Delay (s)		92.4			195.3			172.1			283.9	
Approach LOS		F			F			F			F	

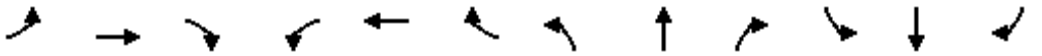
Intersection Summary			
HCM 2000 Control Delay	181.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.7
Intersection Capacity Utilization	126.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	1613	22	164	2632	52	13	80	120	156
v/c Ratio	0.51	0.50	0.02	0.73	0.74	0.05	0.10	0.54	0.69	0.49
Control Delay	107.9	9.3	0.2	75.8	10.3	0.8	54.8	29.7	78.5	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.9	9.3	0.2	75.8	10.3	0.8	54.8	29.7	78.5	18.4
Queue Length 50th (ft)	67	209	0	168	211	0	11	6	110	16
Queue Length 95th (ft)	m92	553	m0	m209	356	m0	27	43	164	81
Internal Link Dist (ft)		3132			3156			809		736
Turn Bay Length (ft)	400		410	385		385	150		150	
Base Capacity (vph)	251	3222	1043	288	3577	1145	131	257	178	372
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.50	0.02	0.57	0.74	0.05	0.10	0.31	0.67	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1500	20	156	2500	49	10	5	58	104	16	120
Future Volume (vph)	60	1500	20	156	2500	49	10	5	58	104	16	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1604		1770	1616	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.37	1.00		0.56	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	697	1604		1049	1616	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.78	0.78	0.78	0.87	0.87	0.87
Adj. Flow (vph)	65	1613	22	164	2632	52	13	6	74	120	18	138
RTOR Reduction (vph)	0	0	8	0	0	17	0	69	0	0	121	0
Lane Group Flow (vph)	65	1613	14	164	2632	35	13	11	0	120	35	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA		D.P+P	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6			2		
Actuated Green, G (s)	9.5	92.4	92.4	19.1	102.0	102.0	20.5	10.0		20.5	18.5	
Effective Green, g (s)	9.5	92.4	92.4	19.1	102.0	102.0	20.5	10.0		20.5	18.5	
Actuated g/C Ratio	0.06	0.62	0.62	0.13	0.68	0.68	0.14	0.07		0.14	0.12	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	112	3132	975	225	3457	1076	109	106		193	199	
v/s Ratio Prot	0.04	0.32		c0.09	c0.52		0.00	0.01		c0.04	0.02	
v/s Ratio Perm			0.01			0.02	0.01			c0.04		
v/c Ratio	0.58	0.52	0.01	0.73	0.76	0.03	0.12	0.10		0.62	0.18	
Uniform Delay, d1	68.3	16.2	11.2	63.0	15.9	7.9	56.5	65.8		60.0	58.9	
Progression Factor	1.46	0.56	1.00	1.03	0.62	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	0.5	0.0	6.9	1.0	0.0	0.5	0.4		6.1	0.4	
Delay (s)	105.7	9.6	11.2	71.9	10.8	7.9	57.0	66.2		66.1	59.3	
Level of Service	F	A	B	E	B	A	E	E		E	E	
Approach Delay (s)		13.3			14.3			64.9			62.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	304	402	1151	367	196	359
v/c Ratio	0.69	0.59	1.64	0.28	0.68	0.64
Control Delay	44.6	7.1	322.2	7.1	53.6	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	7.1	322.2	7.1	53.6	9.7
Queue Length 50th (ft)	179	0	~1084	78	120	0
Queue Length 95th (ft)	298	76	#1700	156	219	82
Internal Link Dist (ft)	1544			1207	1360	
Turn Bay Length (ft)		260	475		230	230
Base Capacity (vph)	736	869	700	1588	505	722
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.46	1.64	0.23	0.39	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	370	1070	330	180	330
Future Volume (vph)	280	370	1070	330	180	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1703	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1703	1583
Peak-hour factor, PHF	0.92	0.92	0.93	0.90	0.92	0.92
Adj. Flow (vph)	304	402	1151	367	196	359
RTOR Reduction (vph)	0	306	0	0	0	298
Lane Group Flow (vph)	304	96	1151	367	196	61
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	8		7	4	2	
Permitted Phases		8				2
Actuated Green, G (s)	24.5	24.5	40.7	71.7	17.4	17.4
Effective Green, g (s)	24.5	24.5	40.7	71.7	17.4	17.4
Actuated g/C Ratio	0.24	0.24	0.40	0.70	0.17	0.17
Clearance Time (s)	6.5	6.5	6.5	6.5	7.0	7.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	3.0	3.0
Lane Grp Cap (vph)	444	378	702	1301	288	268
v/s Ratio Prot	c0.16		c0.65	0.20	c0.12	
v/s Ratio Perm		0.06				0.04
v/c Ratio	0.68	0.25	1.64	0.28	0.68	0.23
Uniform Delay, d1	35.5	31.6	30.9	5.8	40.0	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	0.5	294.2	0.2	6.5	0.4
Delay (s)	40.2	32.1	325.2	6.0	46.5	37.2
Level of Service	D	C	F	A	D	D
Approach Delay (s)	35.6			248.0	40.5	
Approach LOS	D			F	D	

Intersection Summary			
HCM 2000 Control Delay	152.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

2045 Full Build

HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2045
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 Full Build AM
Project Description	James River Freeway EB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.917	877	4800	0.18	72.2	6.1	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.935	0.641	860	102	7200	2100	0.12	0.05	72.2	72.2	4.0	4.0	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.935	791	4800	0.16	72.2	5.5	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.877	0.847	2036	1193	7200	2100	0.28	0.57	72.2	72.2	9.4	9.4	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.92	0.862	2030	4800	0.42	70.2	14.5	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.8	7.2	6.5	1.00	A

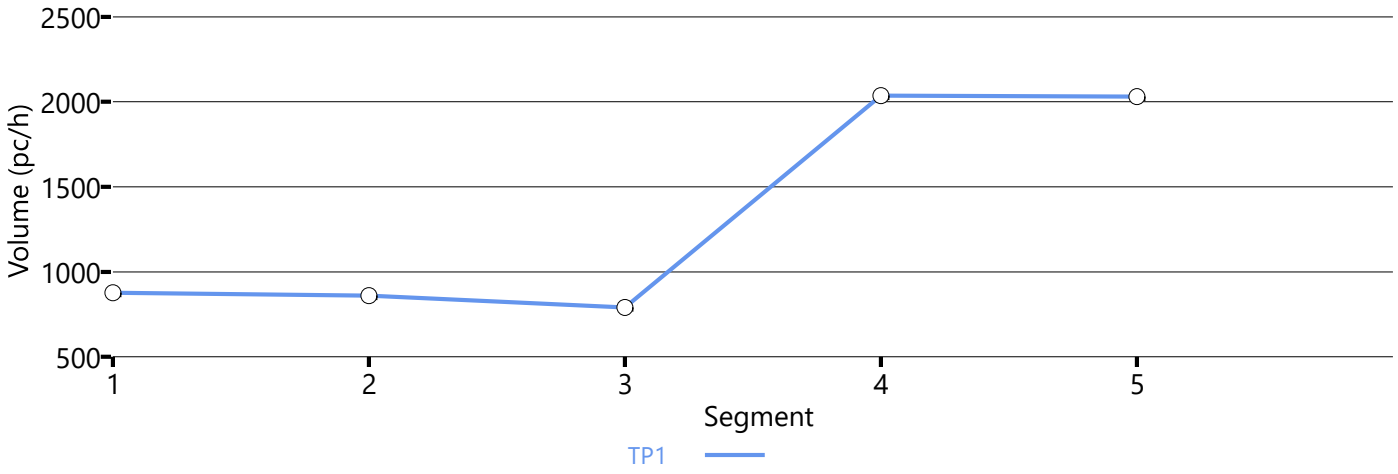
Facility Overall Results

Space Mean Speed, mi/h	71.8	Density, veh/mi/ln	6.5
Average Travel Time, min	1.00	Density, pc/mi/ln	7.2

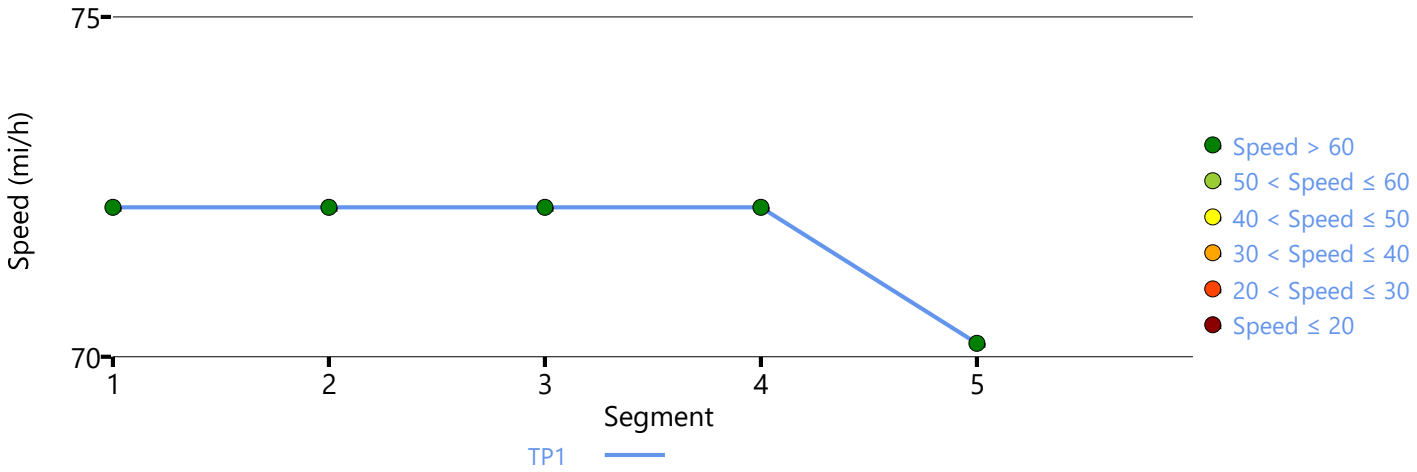
Messages

Comments

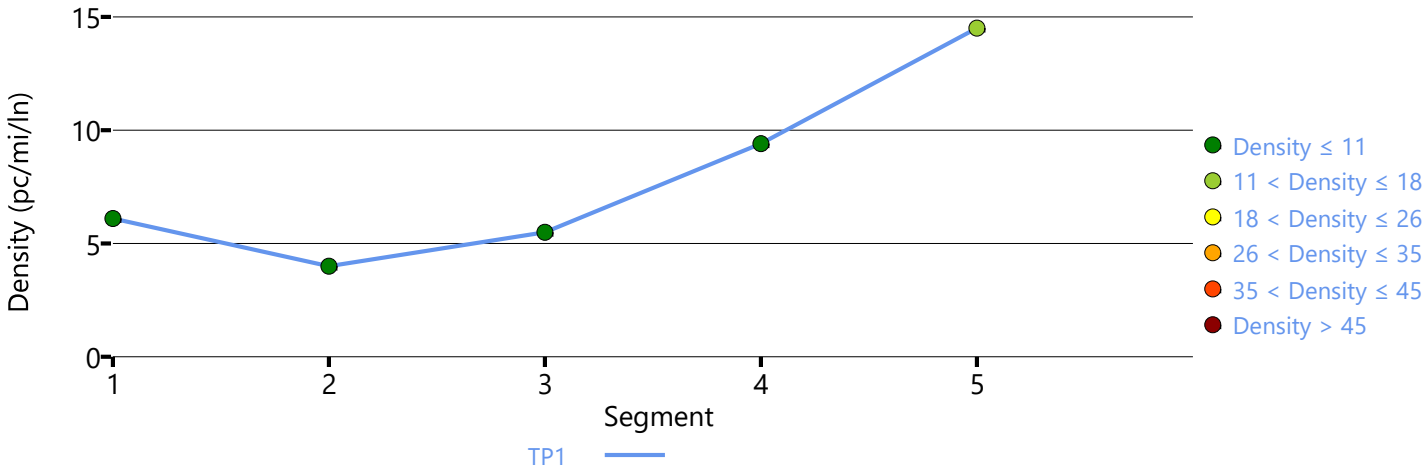
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2045
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 Full Build AM
Project Description	James River Freeway WB AM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.13		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	WB Diverge at MM	775	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.794	1424	4800	0.30	72.2	9.9	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.781	0.820	1447	504	7200	2100	0.20	0.24	72.2	72.2	6.7	6.7	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.877	818	4800	0.17	72.2	5.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.877	0.602	981	163	7200	2100	0.14	0.08	72.2	72.2	4.5	4.5	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.92	0.862	946	4800	0.20	72.2	6.6	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	6.2	5.2	0.90	A

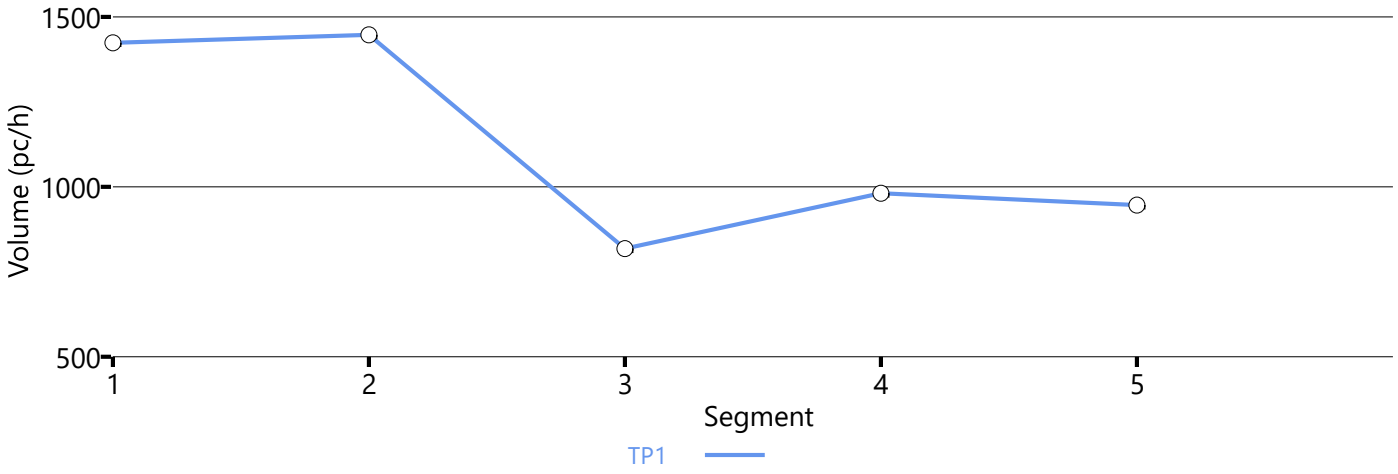
Facility Overall Results

Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	5.2
Average Travel Time, min	0.90	Density, pc/mi/ln	6.2

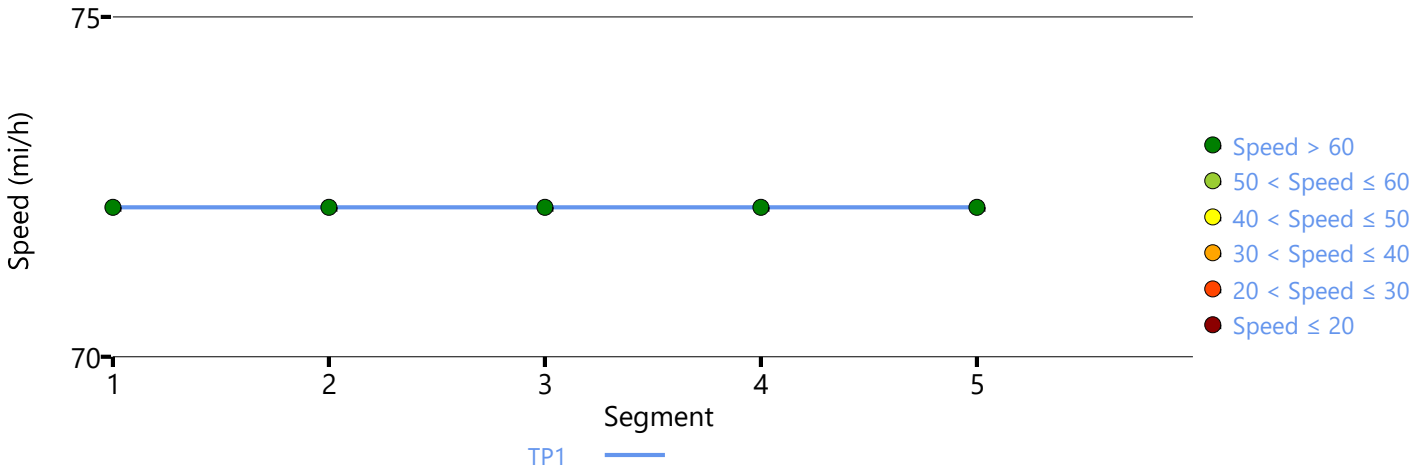
Messages

Comments

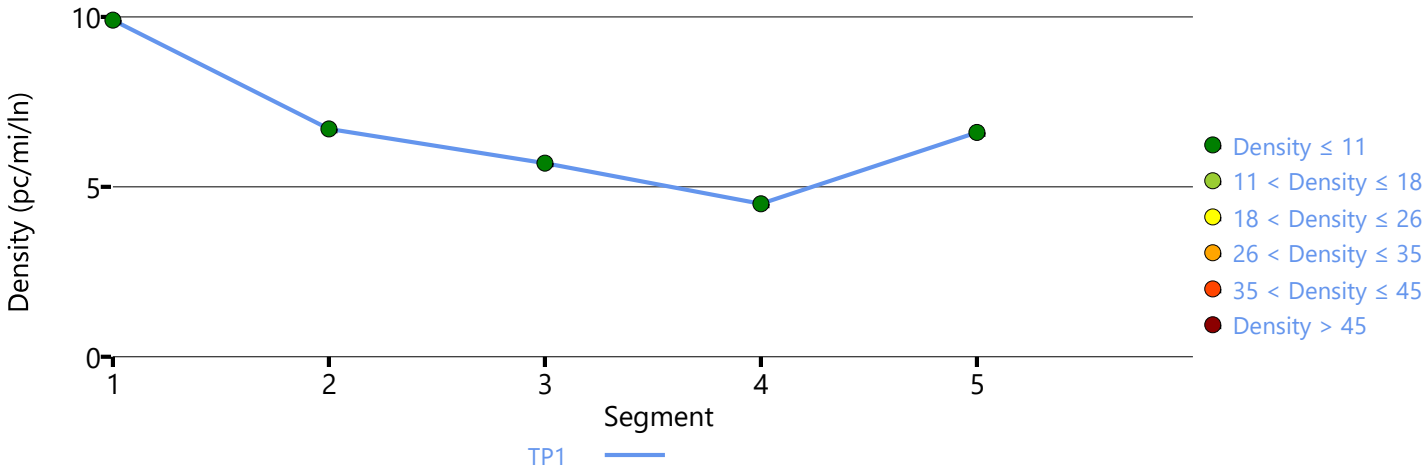
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2045
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 Full Build PM
Project Description	James River Freeway EB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.14		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	EB Diverge at MM	755	3
3	Basic	Basic	EB at MM	2675	2
4	Merge	Basic	EB Merge at MM	1100	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.893	1315	4800	0.27	72.2	9.1	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.909	0.641	1291	102	7200	2100	0.18	0.05	72.2	72.2	6.0	6.0	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.909	1220	4800	0.25	72.2	8.4	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.833	0.893	2597	1266	7200	2100	0.36	0.60	72.2	72.2	12.0	12.0	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.92	0.862	2598	4800	0.54	71.8	18.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	10.0	8.7	1.00	A

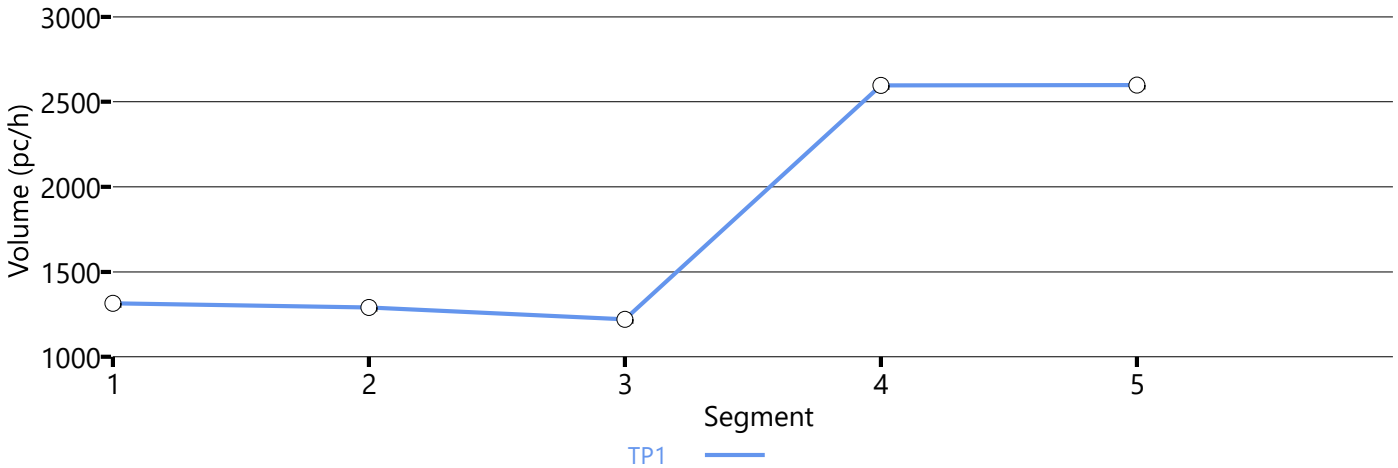
Facility Overall Results

Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	8.7
Average Travel Time, min	1.00	Density, pc/mi/ln	10.0

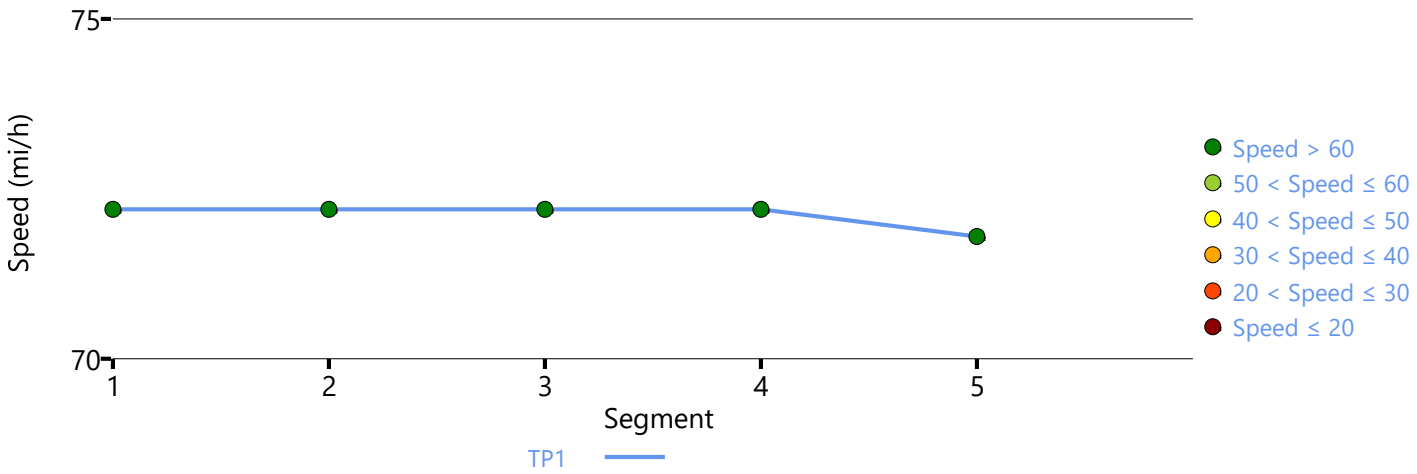
Messages

Comments

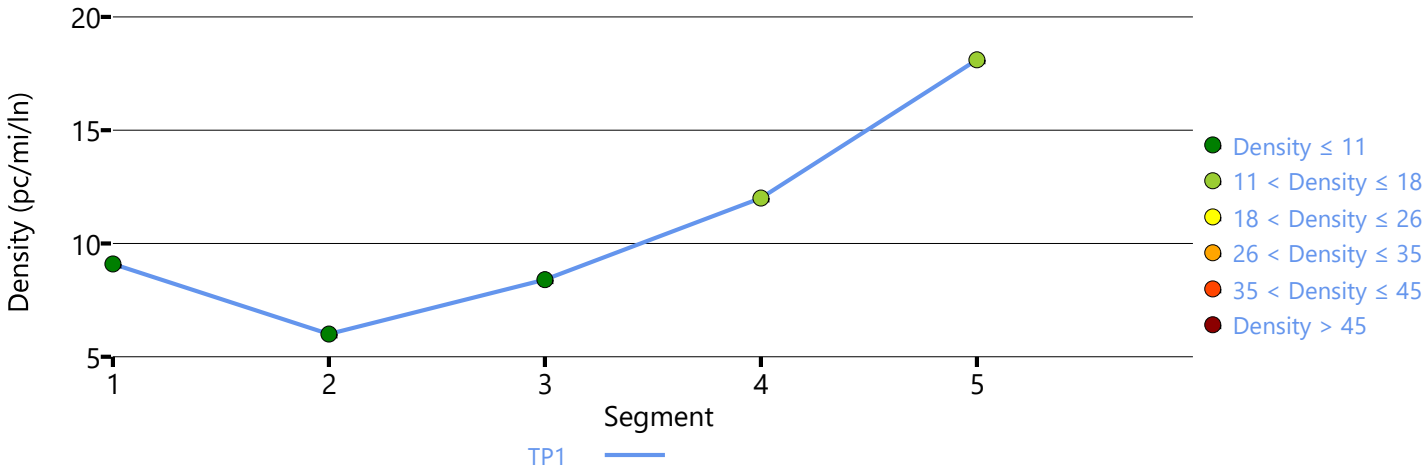
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	Olsson	Date	8/2/2021
Agency	MoDOT	Analysis Year	2045
Jurisdiction	Southwest District	Time Period Analyzed	Future Year 2045 Full Build PM
Project Description	James River Freeway WB PM	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.13		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		750	2
2	Diverge	Basic	WB Diverge at MM	775	3
3	Basic	Basic	WB at MM	2665	2
4	Merge	Basic	WB Merge at MM	1025	3
5	Basic	Basic		750	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.893	1899	4800	0.40	72.2	13.2	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.893	0.909	1899	682	7200	2100	0.26	0.32	72.2	72.2	8.8	8.8	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	1141	4800	0.24	72.2	7.9	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.575	1311	170	7200	2100	0.18	0.08	72.2	72.2	6.1	6.1	A

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.92	0.926	1268	4800	0.26	70.2	9.0	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.0	8.4	7.7	0.90	A

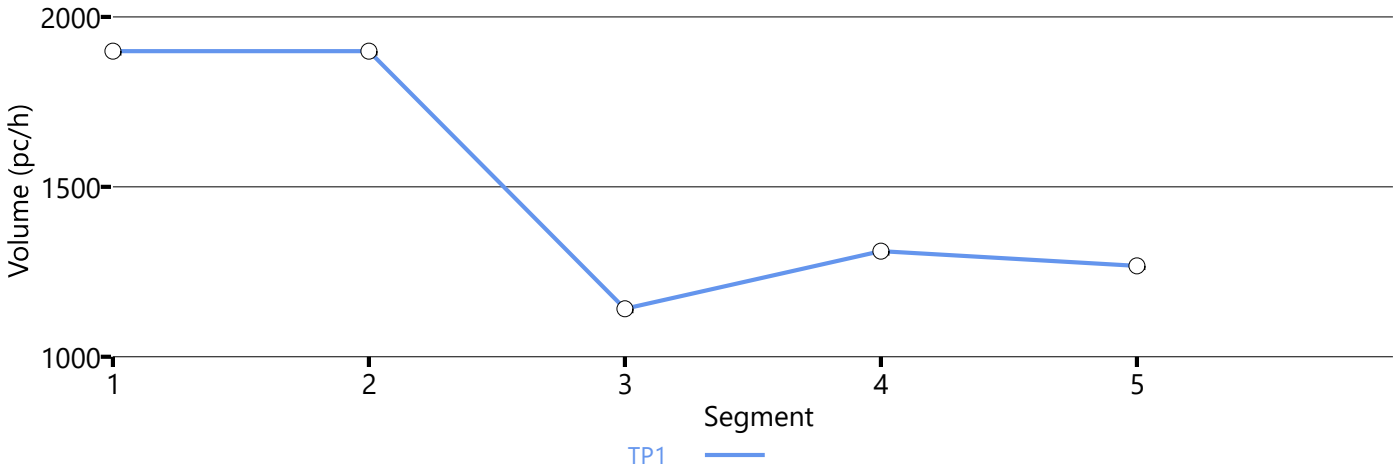
Facility Overall Results

Space Mean Speed, mi/h	72.0	Density, veh/mi/ln	7.7
Average Travel Time, min	0.90	Density, pc/mi/ln	8.4

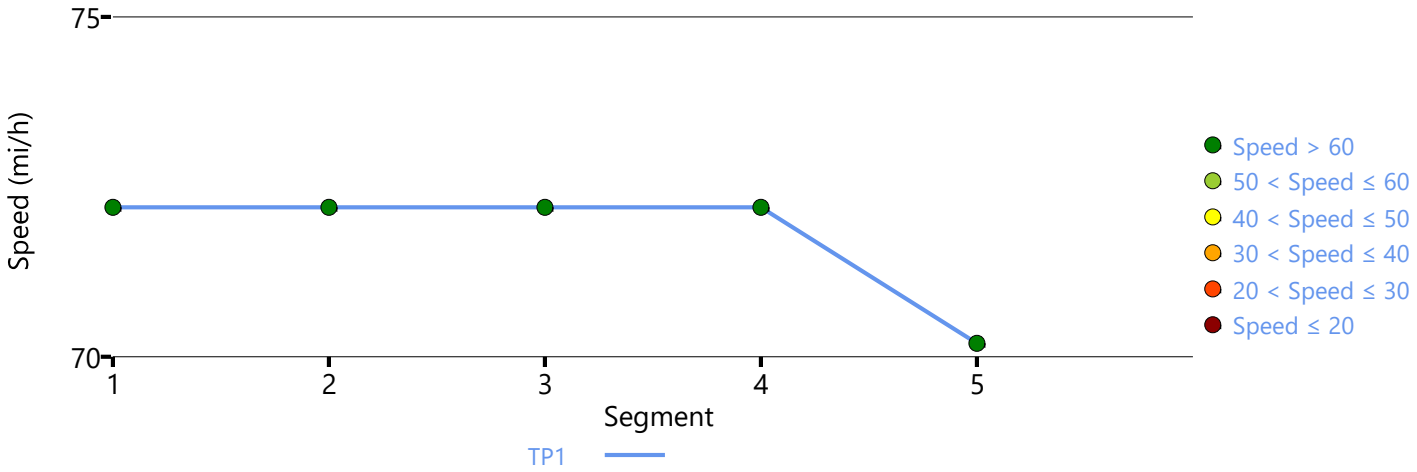
Messages

Comments

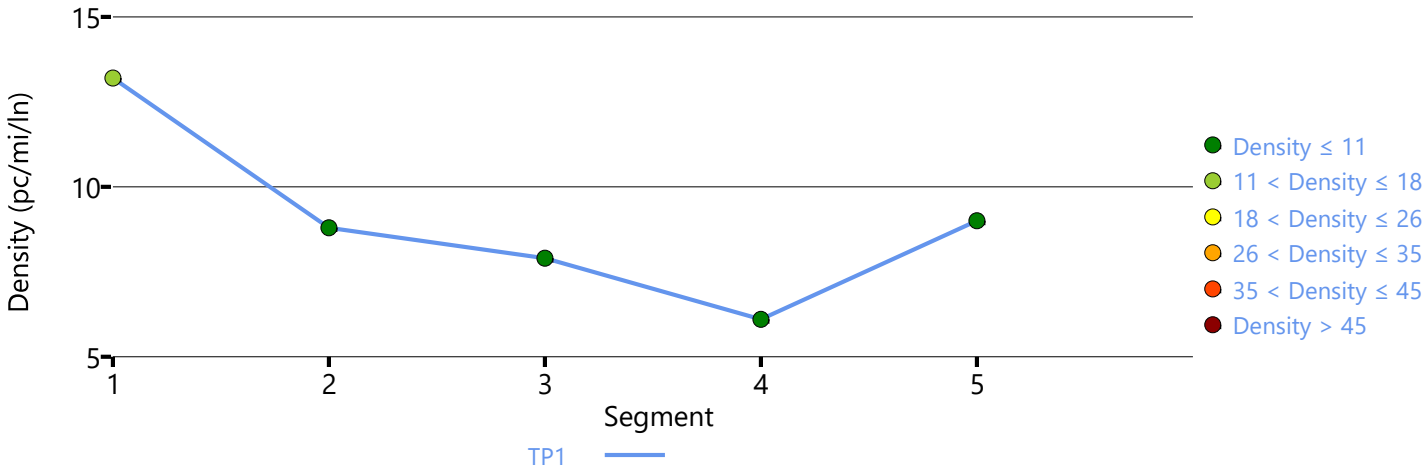
Volume Distribution



Speed Distribution



Density Distribution



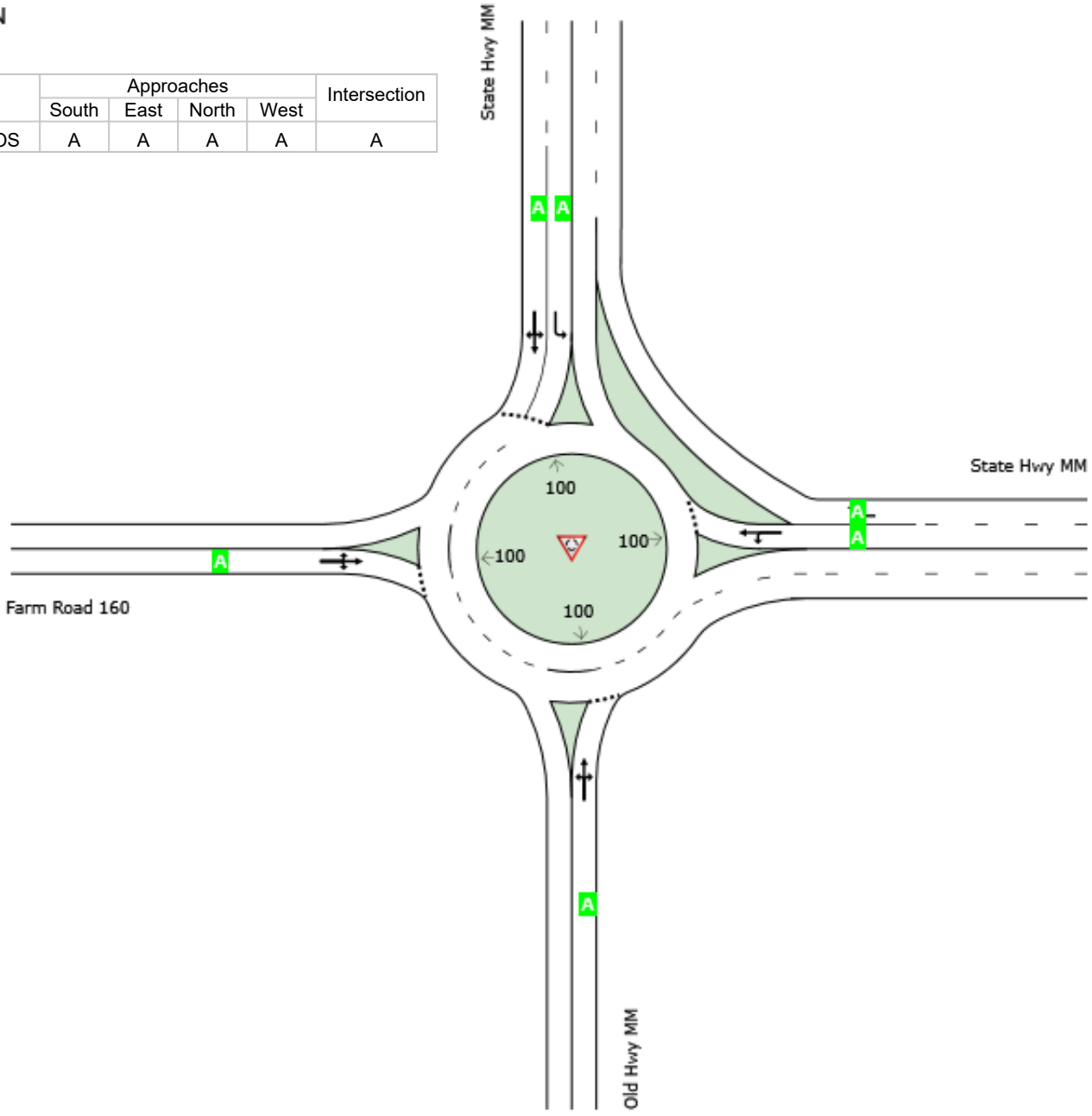
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [FR 160 & Hwy MM FB 2045 AM - Free WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [FR 160 & Hwy MM FB 2045 AM - Free WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Hwy MM													
Lane 1[d]	65	3.0	585	0.111	100	7.5	LOS A	0.4	9.5	Full	1600	0.0	0.0
Approach	65	3.0		0.111		7.5	LOS A	0.4	9.5				
East: State Hwy MM													
Lane 1[d]	109	3.0	1171	0.093	100	3.9	LOS A	0.4	9.4	Full	1600	0.0	0.0
Lane 2	1565	3.0	1626	0.963	100	5.9	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1674	3.0		0.963		5.8	LOS A	0.4	9.4				
North: State Hwy MM													
Lane 1	457	3.0	1232	0.370	100	6.5	LOS A	2.0	51.6	Full	1000	0.0	0.0
Lane 2[d]	457	3.0	1232	0.370	100	6.5	LOS A	2.0	51.6	Full	1000	0.0	0.0
Approach	913	3.0		0.370		6.5	LOS A	2.0	51.6				
West: Farm Road 160													
Lane 1[d]	217	3.0	682	0.319	100	9.3	LOS A	1.3	32.8	Full	1600	0.0	0.0
Approach	217	3.0		0.319		9.3	LOS A	1.3	32.8				
Intersection	2870	3.0		0.963		3.1	LOS A	2.0	51.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Old Hwy MM

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	43	11	65	3.0	585	0.111	100	NA	NA
Approach	11	43	11	65	3.0		0.111			

East: State Hwy MM

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	11	98	-	109	3.0	1171	0.093	100	NA	NA
Lane 2	-	-	1565	1565	3.0	1626	0.963	100	NA	NA
Approach	11	98	1565	1674	3.0		0.963			
North: State Hwy MM										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	457	-	-	457	3.0	1232	0.370	100	NA	NA
Lane 2	315	22	120	457	3.0	1232	0.370	100	NA	NA
Approach	772	22	120	913	3.0		0.370			
West: Farm Road 160										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	120	87	11	217	3.0	682	0.319	100	NA	NA
Approach	120	87	11	217	3.0		0.319			
	Total	%HV	Deg.Satn (v/c)							
Intersection	2870	3.0		0.963						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Old Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Farm Road 160 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

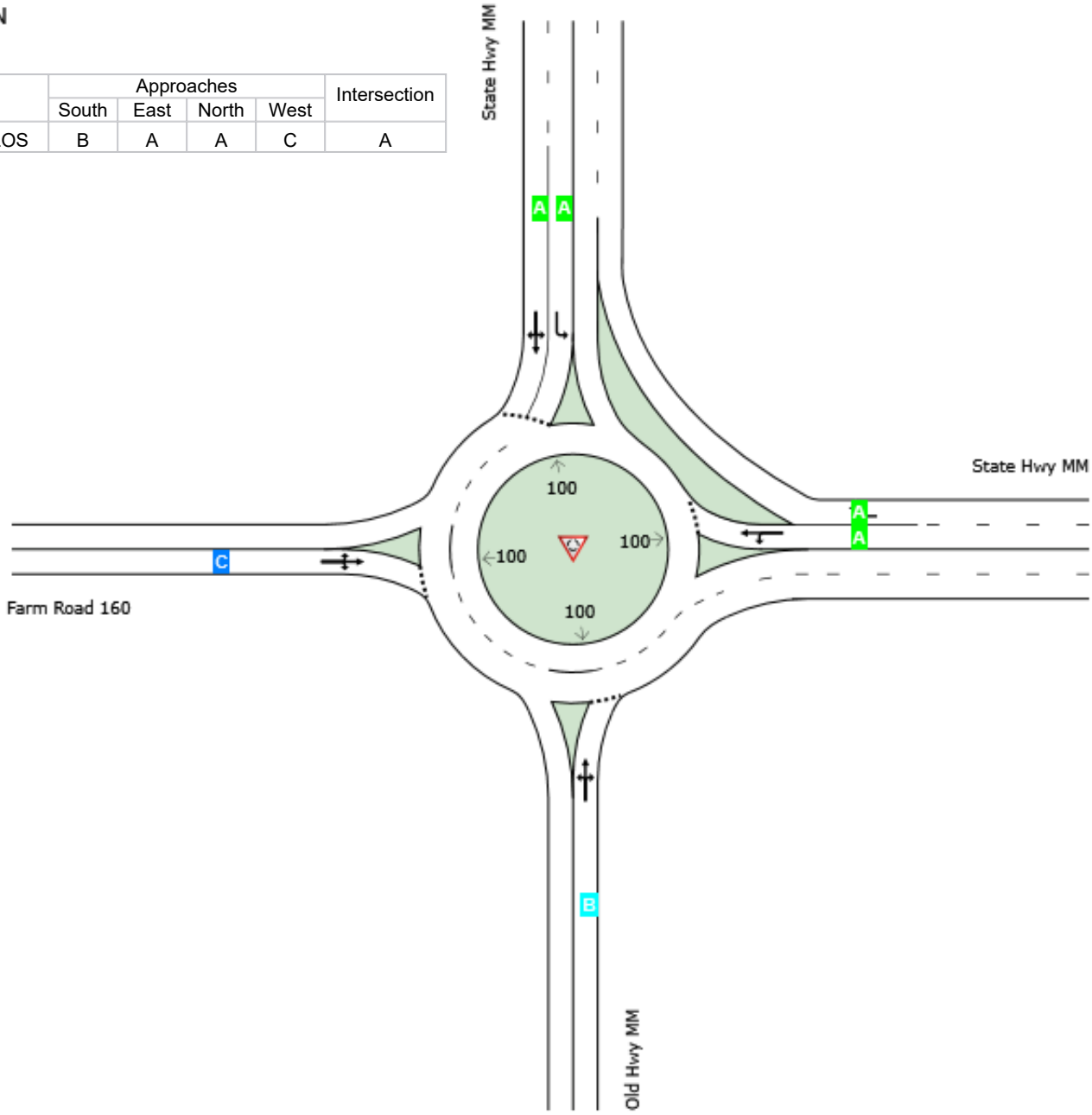
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [FR 160 & Hwy MM FB 2045 PM - Free WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	C	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [FR 160 & Hwy MM FB 2045 PM - Free WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Hwy MM													
Lane 1[d]	54	3.0	389	0.140	100	11.5	LOS B	0.4	11.2	Full	1600	0.0	0.0
Approach	54	3.0		0.140		11.5	LOS B	0.4	11.2				
East: State Hwy MM													
Lane 1[d]	76	3.0	1148	0.066	100	3.7	LOS A	0.3	6.6	Full	1600	0.0	0.0
Lane 2	1043	3.0	1626	0.642	100	0.7	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1120	3.0		0.642		0.9	LOS A	0.3	6.6				
North: State Hwy MM													
Lane 1	668	3.0	1271	0.526	100	8.6	LOS A	3.7	94.3	Full	1000	0.0	0.0
Lane 2[d]	668	3.0	1271	0.526	100	8.6	LOS A	3.7	94.3	Full	1000	0.0	0.0
Approach	1337	3.0		0.526		8.6	LOS A	3.7	94.3				
West: Farm Road 160													
Lane 1[d]	315	3.0	493	0.639	100	22.5	LOS C	3.8	96.1	Full	1600	0.0	0.0
Approach	315	3.0		0.639		22.5	LOS C	3.8	96.1				
Intersection	2826	3.0		0.642		6.9	LOS A	3.8	96.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Old Hwy MM

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	33	11	54	3.0	389	0.140	100	NA	NA
Approach	11	33	11	54	3.0		0.140			

East: State Hwy MM

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	11	65	-	76	3.0	1148	0.066	100	NA	NA
Lane 2	-	-	1043	1043	3.0	1626	0.642	100	NA	NA
Approach	11	65	1043	1120	3.0		0.642			

North: State Hwy MM										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	668	-	-	668	3.0	1271	0.526	100	NA	NA
Lane 2	473	22	174	668	3.0	1271	0.526	100	NA	NA
Approach	1141	22	174	1337	3.0		0.526			

West: Farm Road 160										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	152	152	11	315	3.0	493	0.639	100	NA	NA
Approach	152	152	11	315	3.0		0.639			

	Total	%HV	Deg.Satn (v/c)
Intersection	2826	3.0	0.642

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

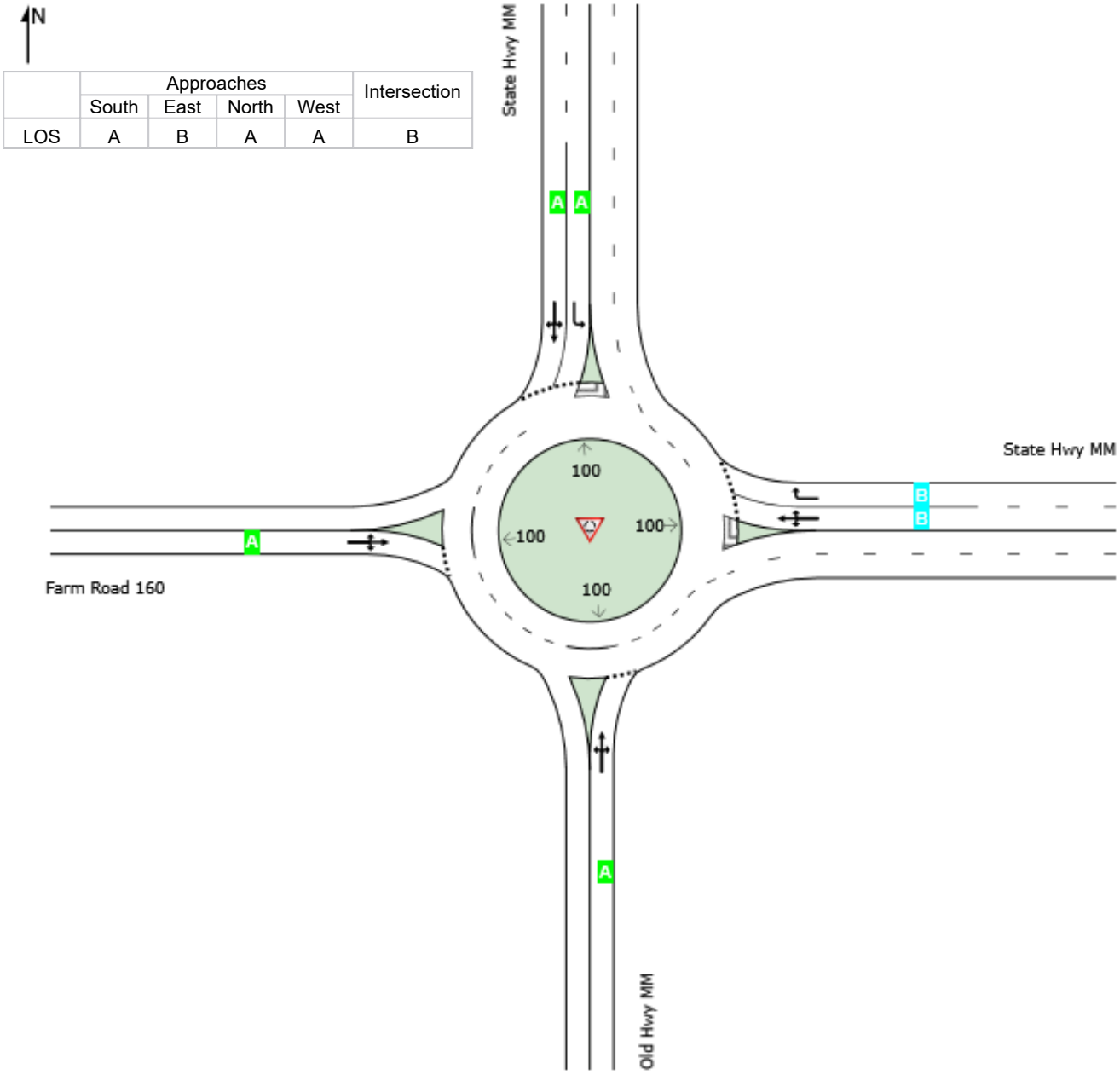
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Old Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Farm Road 160 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [FR 160 & Hwy MM FB 2045 AM - 2Ln (Site Folder: General)]

New Site
Site Category: (None)
Roundabout



	Approaches				Intersection
	South	East	North	West	
LOS	A	B	A	A	B

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [FR 160 & Hwy MM FB 2045 AM - 2Ln (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Hwy MM													
Lane 1[d]	65	3.0	585	0.111	100	7.5	LOS A	0.4	9.5	Full	1600	0.0	0.0
Approach	65	3.0		0.111		7.5	LOS A	0.4	9.5				
East: State Hwy MM													
Lane 1	837	3.0	1171	0.715	100	13.9	LOS B	10.0	257.1	Full	1600	0.0	0.0
Lane 2[d]	837	3.0	1171	0.715	100	13.9	LOS B	10.0	257.1	Full	1600	0.0	0.0
Approach	1674	3.0		0.715		13.9	LOS B	10.0	257.1				
North: State Hwy MM													
Lane 1	457	3.0	1232	0.370	100	6.5	LOS A	2.0	51.6	Full	1000	0.0	0.0
Lane 2[d]	457	3.0	1232	0.370	100	6.5	LOS A	2.0	51.6	Full	1000	0.0	0.0
Approach	913	3.0		0.370		6.5	LOS A	2.0	51.6				
West: Farm Road 160													
Lane 1[d]	217	3.0	682	0.319	100	9.3	LOS A	1.3	32.8	Full	1600	0.0	0.0
Approach	217	3.0		0.319		9.3	LOS A	1.3	32.8				
Intersection	2870	3.0		0.715		11.1	LOS B	10.0	257.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Old Hwy MM

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	43	11	65	3.0	585	0.111	100	NA	NA
Approach	11	43	11	65	3.0		0.111			

East: State Hwy MM

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	11	98	728	837	3.0	1171	0.715	100	NA	NA
Lane 2	-	-	837	837	3.0	1171	0.715	100	NA	NA
Approach	11	98	1565	1674	3.0		0.715			

North: State Hwy MM

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	457	-	-	457	3.0	1232	0.370	100	NA	NA
Lane 2	315	22	120	457	3.0	1232	0.370	100	NA	NA
Approach	772	22	120	913	3.0		0.370			

West: Farm Road 160

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	120	87	11	217	3.0	682	0.319	100	NA	NA
Approach	120	87	11	217	3.0		0.319			

	Total	%HV	Deg.Satn (v/c)
Intersection	2870	3.0	0.715

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Old Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Farm Road 160 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

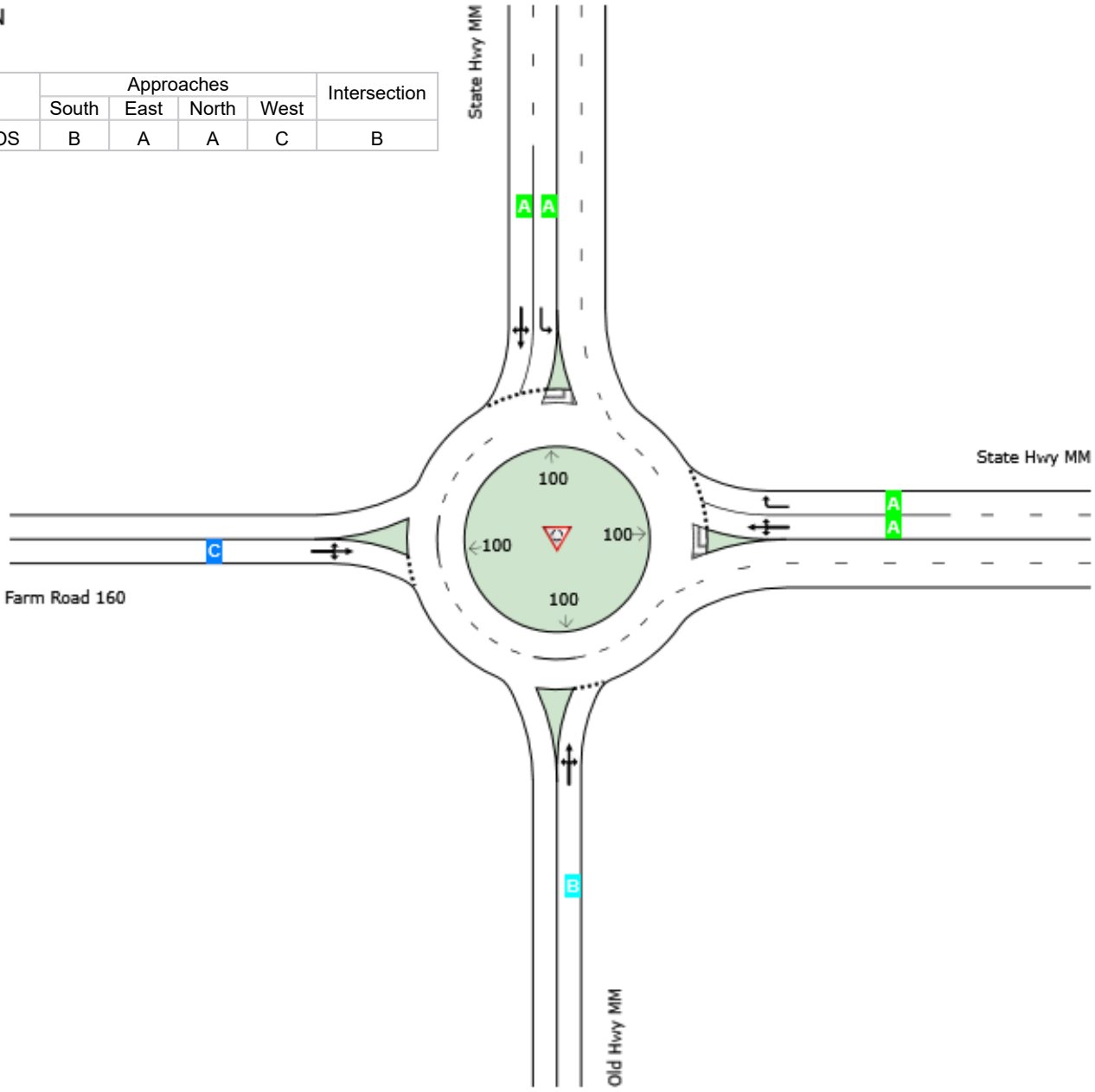
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [FR 160 & Hwy MM FB 2045 PM - 2Ln (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	C	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [FR 160 & Hwy MM FB 2045 PM - 2Ln (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Hwy MM													
Lane 1[d]	54	3.0	389	0.140	100	11.5	LOS B	0.4	11.2	Full	1600	0.0	0.0
Approach	54	3.0		0.140		11.5	LOS B	0.4	11.2				
East: State Hwy MM													
Lane 1	560	3.0	1148	0.488	100	8.5	LOS A	2.9	75.5	Full	1600	0.0	0.0
Lane 2[d]	560	3.0	1148	0.488	100	8.5	LOS A	2.9	75.5	Full	1600	0.0	0.0
Approach	1120	3.0		0.488		8.5	LOS A	2.9	75.5				
North: State Hwy MM													
Lane 1	668	3.0	1271	0.526	100	8.6	LOS A	3.7	94.3	Full	1000	0.0	0.0
Lane 2[d]	668	3.0	1271	0.526	100	8.6	LOS A	3.7	94.3	Full	1000	0.0	0.0
Approach	1337	3.0		0.526		8.6	LOS A	3.7	94.3				
West: Farm Road 160													
Lane 1[d]	315	3.0	493	0.639	100	22.5	LOS C	3.8	96.1	Full	1600	0.0	0.0
Approach	315	3.0		0.639		22.5	LOS C	3.8	96.1				
Intersection	2826	3.0		0.639		10.2	LOS B	3.8	96.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Old Hwy MM

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	33	11	54	3.0	389	0.140	100	NA	NA
Approach	11	33	11	54	3.0		0.140			

East: State Hwy MM

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	11	65	484	560	3.0	1148	0.488	100	NA	NA
Lane 2	-	-	560	560	3.0	1148	0.488	100	NA	NA
Approach	11	65	1043	1120	3.0		0.488			

North: State Hwy MM

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	668	-	-	668	3.0	1271	0.526	100	NA	NA
Lane 2	473	22	174	668	3.0	1271	0.526	100	NA	NA
Approach	1141	22	174	1337	3.0		0.526			

West: Farm Road 160

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	152	152	11	315	3.0	493	0.639	100	NA	NA
Approach	152	152	11	315	3.0		0.639			

	Total	%HV	Deg.Satn (v/c)
Intersection	2826	3.0	0.639

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

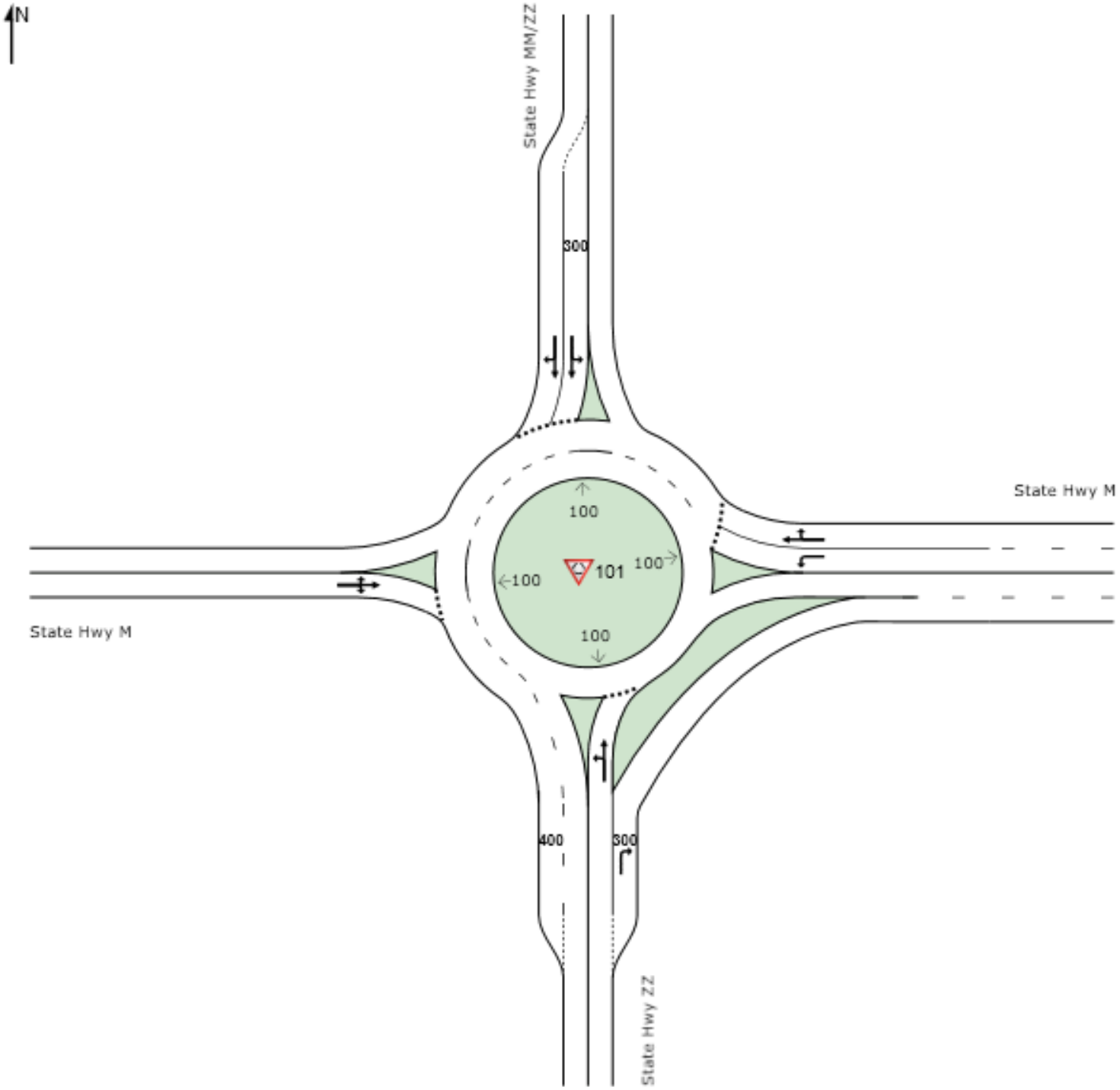
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Old Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Farm Road 160 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [State Hwy M & ZZ FB 2045 PM - Hybrid (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



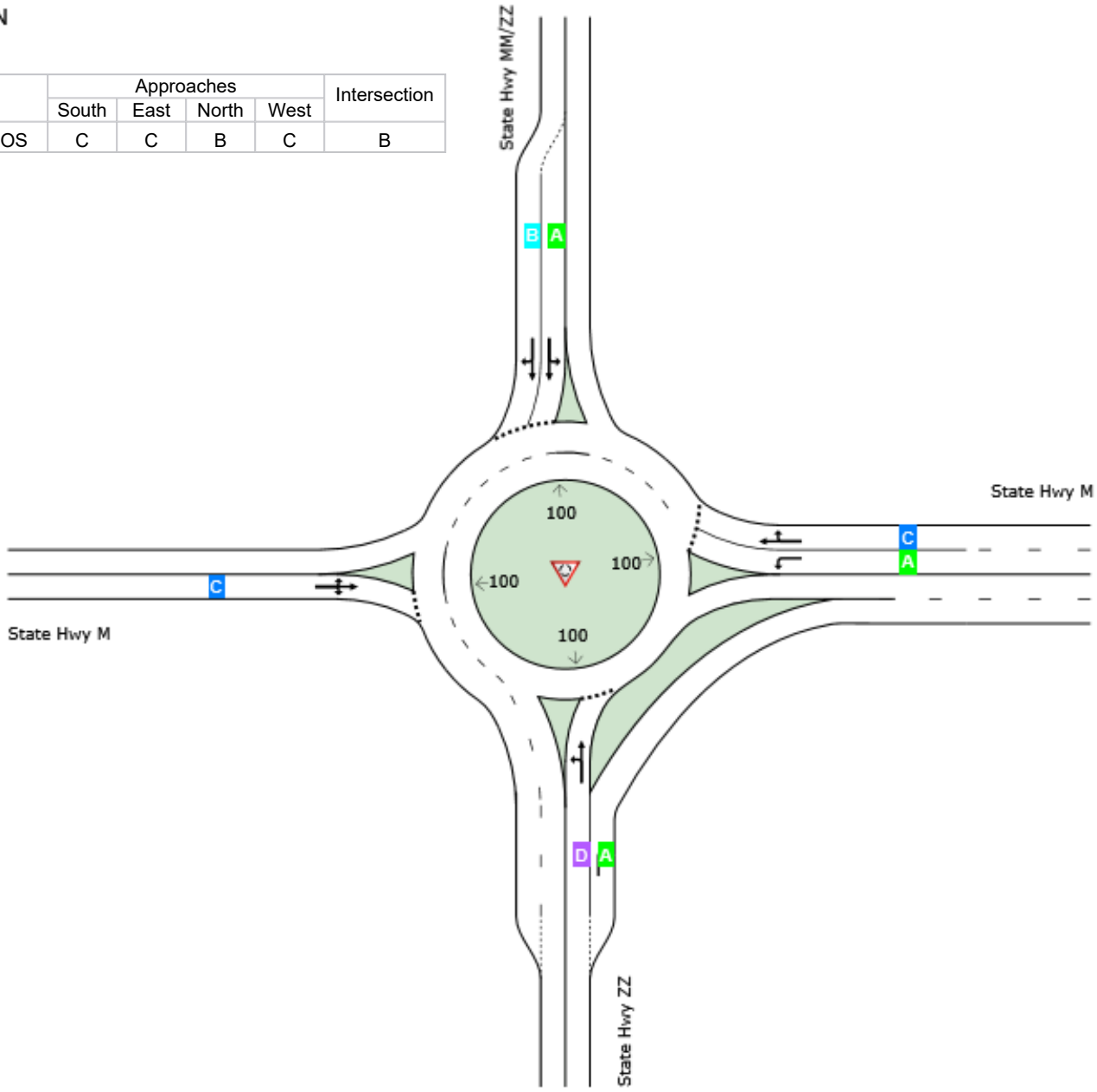
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [State Hwy M & ZZ FB 2045 AM - Hybrid (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	C	B	C	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [State Hwy M & ZZ FB 2045 AM - Hybrid (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: State Hwy ZZ													
Lane 1[d]	652	2.0	799	0.816	100	25.2	LOS D	12.4	314.2	Full	900	0.0	0.0
Lane 2	391	2.0	1642	0.238	100	0.1	LOS A	0.0	0.0	Short	300	0.0	NA
Approach	1043	2.0		0.816		15.8	LOS C	12.4	314.2				
East: State Hwy M													
Lane 1	228	2.0	737	0.310	100	8.6	LOS A	1.3	32.6	Full	1000	0.0	0.0
Lane 2[d]	511	2.0	737	0.693	100	18.6	LOS C	6.6	168.7	Full	1000	0.0	0.0
Approach	739	2.0		0.693		15.5	LOS C	6.6	168.7				
North: State Hwy MM/ZZ													
Lane 1[d]	335	2.0	829	0.404	100	9.3	LOS A	2.0	51.9	Short	300	0.0	NA
Lane 2	241	2.0	755	0.319	79[6]	12.4	LOS B	1.3	33.6	Full	1600	0.0	0.0
Approach	576	2.0		0.404		10.6	LOS B	2.0	51.9				
West: State Hwy M													
Lane 1[d]	457	2.0	700	0.652	100	17.9	LOS C	5.1	130.5	Full	1600	0.0	0.0
Approach	457	2.0		0.652		17.9	LOS C	5.1	130.5				
Intersection	2815	2.0		0.816		15.0	LOS B	12.4	314.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: State Hwy ZZ

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	609	-	652	2.0	799	0.816	100	NA	NA
Lane 2	-	-	391	391	2.0	1642	0.238	100	0.0	1
Approach	43	609	391	1043	2.0		0.816			
East: State Hwy M										

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	228	-	-	228	2.0	737	0.310	100	NA	NA
Lane 2	-	326	185	511	2.0	737	0.693	100	NA	NA
Approach	228	326	185	739	2.0		0.693			
North: State Hwy MM/ZZ										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	185	150	-	335	2.0	829	0.404	100	0.0	2
Lane 2	-	230	11	241	2.0	755	0.319	79[6]	NA	NA
Approach	185	380	11	576	2.0		0.404			
West: State Hwy M										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	380	43	457	2.0	700	0.652	100	NA	NA
Approach	33	380	43	457	2.0		0.652			

	Total	%HV	Deg.Satn (v/c)
Intersection	2815	2.0	0.816

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: State Hwy ZZ Merge Type: **Priority**												
Exit Short Lane	2	400	0.0	379	386	3.00	2.00	274	1450	0.189	2.5	4.0
Merge Lane	1	-	100.0	Merge Lane is not Opposed				379	1800	0.210	0.0	0.0
East Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM/ZZ Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

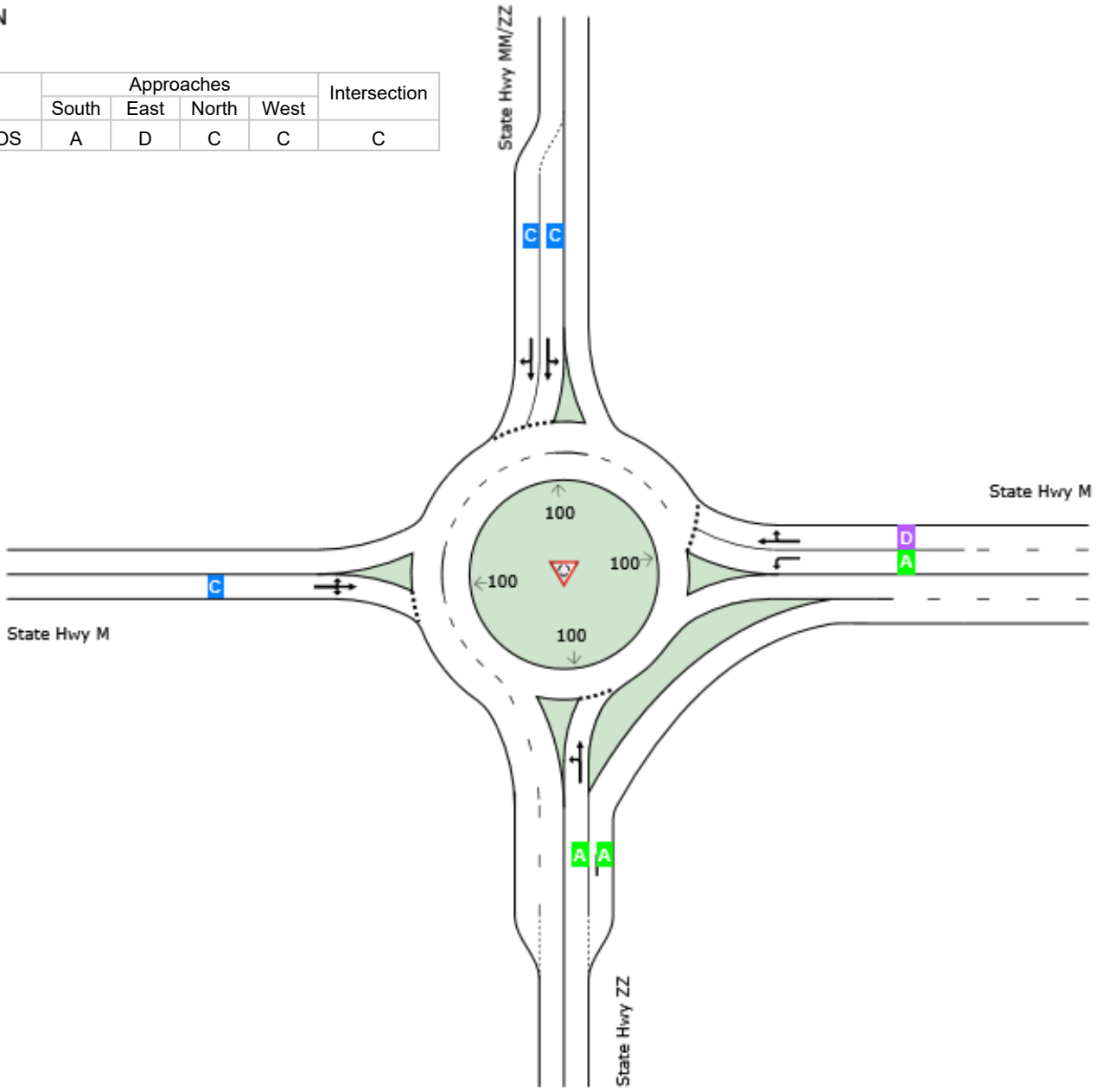
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [State Hwy M & ZZ FB 2045 PM - Hybrid (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	D	C	C	C



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [State Hwy M & ZZ FB 2045 PM - Hybrid (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: State Hwy ZZ													
Lane 1[d]	435	2.0	949	0.458	100	9.3	LOS A	2.8	70.6	Full	900	0.0	0.0
Lane 2	261	2.0	1642	0.159	100	0.0	LOS A	0.0	0.0	Short	300	0.0	NA
Approach	696	2.0		0.458		5.8	LOS A	2.8	70.6				
East: State Hwy M													
Lane 1	391	2.0	921	0.425	100	8.9	LOS A	2.3	59.1	Full	1000	0.0	0.0
Lane 2[d]	837	2.0	921	0.909	100	32.9	LOS D	24.9	631.4	Full	1000	0.0	0.0
Approach	1228	2.0		0.909		25.3	LOS D	24.9	631.4				
North: State Hwy MM/ZZ													
Lane 1[d]	410	2.0	574	0.714	100	23.9	LOS C	5.4	137.1	Short	300	0.0	NA
Lane 2	286	2.0	507	0.564	79[6]	23.7	LOS C	3.2	80.3	Full	1600	0.0	0.0
Approach	696	2.0		0.714		23.8	LOS C	5.4	137.1				
West: State Hwy M													
Lane 1[d]	326	2.0	548	0.595	100	19.3	LOS C	3.5	88.7	Full	1600	0.0	0.0
Approach	326	2.0		0.595		19.3	LOS C	3.5	88.7				
Intersection	2946	2.0		0.909		19.7	LOS C	24.9	631.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: State Hwy ZZ

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	391	-	435	2.0	949	0.458	100	NA	NA
Lane 2	-	-	261	261	2.0	1642	0.159	100	0.0	1
Approach	43	391	261	696	2.0		0.458			
East: State Hwy M										

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	391	-	-	391	2.0	921	0.425	100	NA	NA
Lane 2	-	587	250	837	2.0	921	0.909	100	NA	NA
Approach	391	587	250	1228	2.0		0.909			
North: State Hwy MM/ZZ										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	120	290	-	410	2.0	574	0.714	100	0.0	2
Lane 2	-	275	11	286	2.0	507	0.564	79[6]	NA	NA
Approach	120	565	11	696	2.0		0.714			
West: State Hwy M										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	283	33	326	2.0	548	0.595	100	NA	NA
Approach	11	283	33	326	2.0		0.595			
	Total	%HV	Deg.Satn (v/c)							
Intersection	2946	2.0	0.909							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

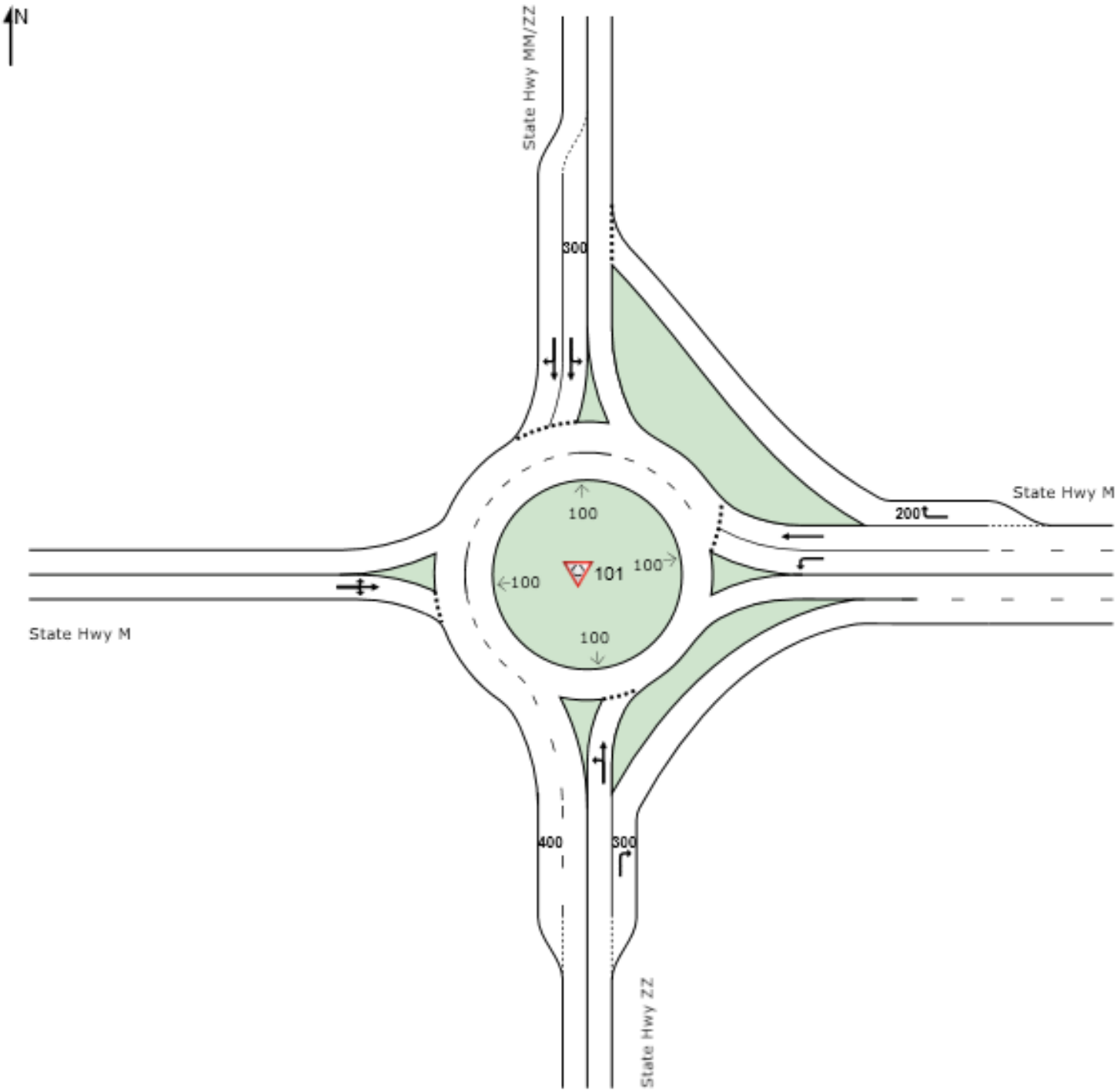
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: State Hwy ZZ Merge Type: **Priority**												
Exit Short Lane	2	400	0.0	681	695	3.00	2.00	308	1216	0.253	3.0	5.2
Merge Lane	1	-	100.0	Merge Lane is not Opposed				681	1800	0.379	0.0	0.0
East Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM/ZZ Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [State Hwy M & ZZ FB 2045 AM - Hybrid + WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



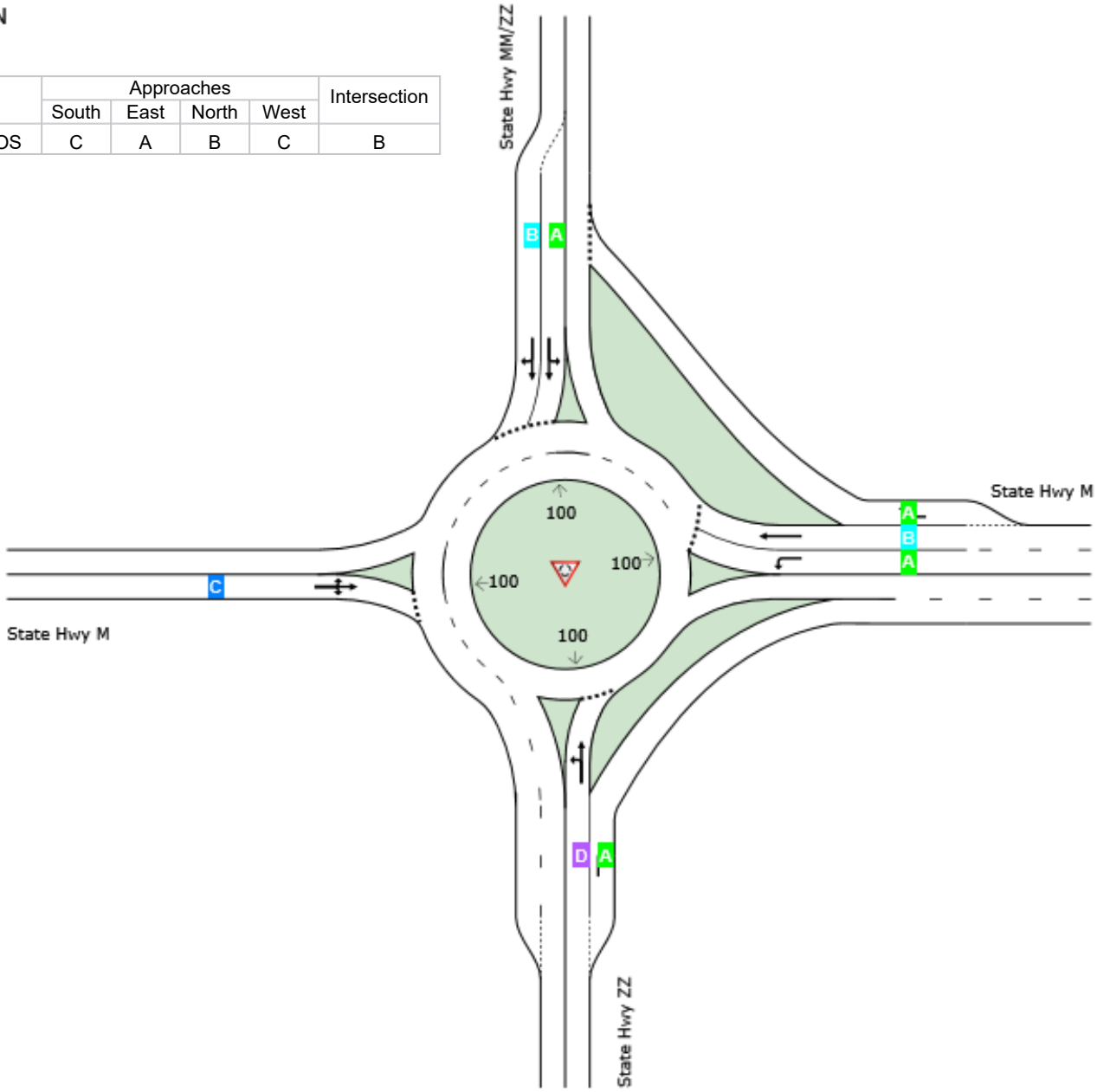
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [State Hwy M & ZZ FB 2045 AM - Hybrid + WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	A	B	C	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [State Hwy M & ZZ FB 2045 AM - Hybrid + WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: State Hwy ZZ													
Lane 1[d]	652	2.0	799	0.816	100	25.2	LOS D	12.4	314.2	Full	900	0.0	0.0
Lane 2	391	2.0	1642	0.238	100	0.1	LOS A	0.0	0.0	Short	300	0.0	NA
Approach	1043	2.0		0.816		15.8	LOS C	12.4	314.2				
East: State Hwy M													
Lane 1	228	2.0	737	0.310	100	8.6	LOS A	1.3	32.6	Full	1000	0.0	0.0
Lane 2[d]	326	2.0	737	0.442	100	10.9	LOS B	2.5	62.6	Full	1000	0.0	0.0
Lane 3	185	2.0	768	0.241	100	7.4	LOS A	1.0	24.6	Short	200	0.0	NA
Approach	739	2.0		0.442		9.3	LOS A	2.5	62.6				
North: State Hwy MM/ZZ													
Lane 1[d]	335	2.0	829	0.404	100	9.3	LOS A	2.0	51.9	Short	300	0.0	NA
Lane 2	241	2.0	755	0.319	79[6]	12.4	LOS B	1.3	33.6	Full	1600	0.0	0.0
Approach	576	2.0		0.404		10.6	LOS B	2.0	51.9				
West: State Hwy M													
Lane 1[d]	457	2.0	700	0.652	100	17.9	LOS C	5.1	130.5	Full	1600	0.0	0.0
Approach	457	2.0		0.652		17.9	LOS C	5.1	130.5				
Intersection	2815	2.0		0.816		13.4	LOS B	12.4	314.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: State Hwy ZZ

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	609	-	652	2.0	799	0.816	100	NA	NA
Lane 2	-	-	391	391	2.0	1642	0.238	100	0.0	1
Approach	43	609	391	1043	2.0		0.816			

East: State Hwy M										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	228	-	-	228	2.0	737	0.310	100	NA	NA
Lane 2	-	326	-	326	2.0	737	0.442	100	NA	NA
Lane 3	-	-	185	185	2.0	768	0.241	100	0.0	2
Approach	228	326	185	739	2.0		0.442			
North: State Hwy MM/ZZ										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	185	150	-	335	2.0	829	0.404	100	0.0	2
Lane 2	-	230	11	241	2.0	755	0.319	79[6]	NA	NA
Approach	185	380	11	576	2.0		0.404			
West: State Hwy M										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	380	43	457	2.0	700	0.652	100	NA	NA
Approach	33	380	43	457	2.0		0.652			

	Total	%HV	Deg.Satn (v/c)
Intersection	2815	2.0	0.816

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

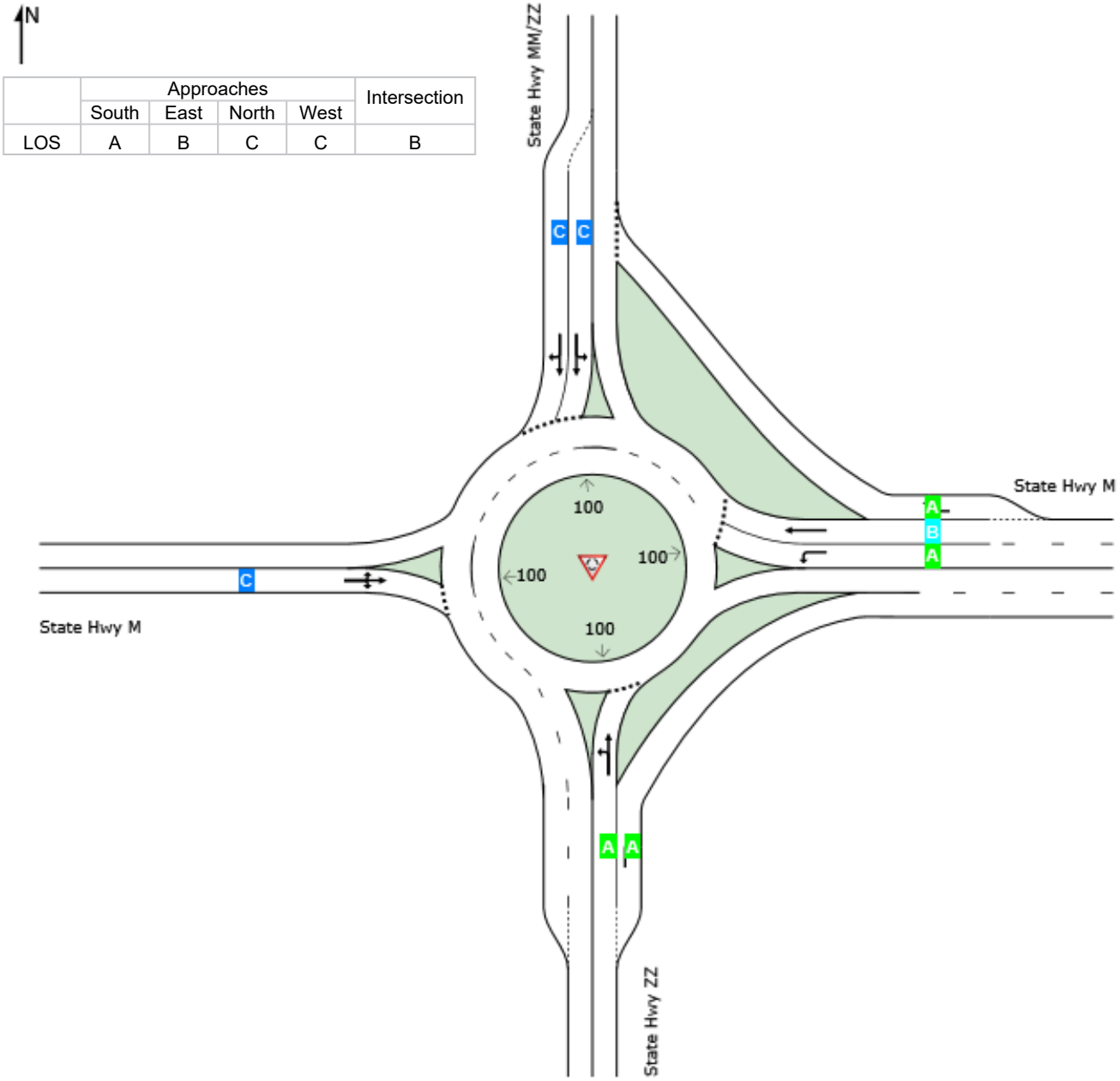
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: State Hwy ZZ Merge Type: **Priority**												
Exit Short Lane	2	400	0.0	379	386	3.00	2.00	274	1450	0.189	2.5	4.0
Merge Lane	1	-	100.0	Merge Lane is not Opposed				379	1800	0.210	0.0	0.0
East Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM/ZZ Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [State Hwy M & ZZ FB 2045 PM - Hybrid + WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout



	Approaches				Intersection
	South	East	North	West	
LOS	A	B	C	C	B

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [State Hwy M & ZZ FB 2045 PM - Hybrid + WBR (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: State Hwy ZZ													
Lane 1[d]	435	2.0	949	0.458	100	9.3	LOS A	2.8	70.6	Full	900	0.0	0.0
Lane 2	261	2.0	1642	0.159	100	0.0	LOS A	0.0	0.0	Short	300	0.0	NA
Approach	696	2.0		0.458		5.8	LOS A	2.8	70.6				
East: State Hwy M													
Lane 1	391	2.0	921	0.425	100	8.9	LOS A	2.3	59.1	Full	1000	0.0	0.0
Lane 2[d]	587	2.0	921	0.638	100	13.7	LOS B	6.7	170.7	Full	1000	0.0	0.0
Lane 3	250	2.0	958	0.261	100	6.4	LOS A	1.1	29.0	Short	200	0.0	NA
Approach	1228	2.0		0.638		10.7	LOS B	6.7	170.7				
North: State Hwy MM/ZZ													
Lane 1[d]	410	2.0	574	0.714	100	23.9	LOS C	5.4	137.1	Short	300	0.0	NA
Lane 2	286	2.0	507	0.564	79[6]	23.7	LOS C	3.2	80.3	Full	1600	0.0	0.0
Approach	696	2.0		0.714		23.8	LOS C	5.4	137.1				
West: State Hwy M													
Lane 1[d]	326	2.0	548	0.595	100	19.3	LOS C	3.5	88.7	Full	1600	0.0	0.0
Approach	326	2.0		0.595		19.3	LOS C	3.5	88.7				
Intersection	2946	2.0		0.714		13.6	LOS B	6.7	170.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: State Hwy ZZ

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	391	-	435	2.0	949	0.458	100	NA	NA
Lane 2	-	-	261	261	2.0	1642	0.159	100	0.0	1
Approach	43	391	261	696	2.0		0.458			

East: State Hwy M										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	391	-	-	391	2.0	921	0.425	100	NA	NA
Lane 2	-	587	-	587	2.0	921	0.638	100	NA	NA
Lane 3	-	-	250	250	2.0	958	0.261	100	0.0	2
Approach	391	587	250	1228	2.0		0.638			
North: State Hwy MM/ZZ										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	120	290	-	410	2.0	574	0.714	100	0.0	2
Lane 2	-	275	11	286	2.0	507	0.564	79[6]	NA	NA
Approach	120	565	11	696	2.0		0.714			
West: State Hwy M										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	283	33	326	2.0	548	0.595	100	NA	NA
Approach	11	283	33	326	2.0		0.595			
	Total	%HV	Deg.Satn (v/c)							
Intersection	2946	2.0	0.714							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

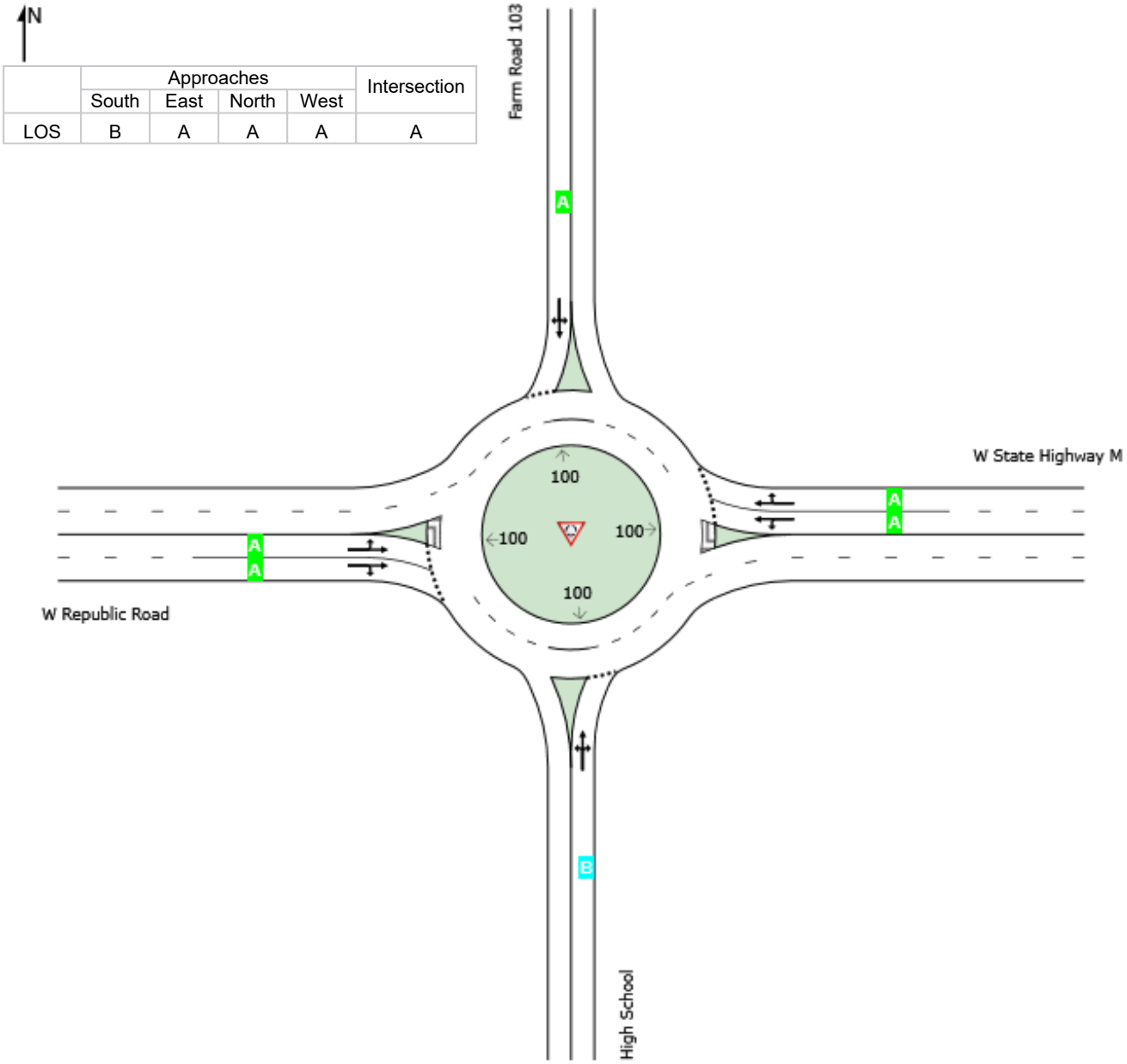
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: State Hwy ZZ Merge Type: **Priority**												
Exit Short Lane	2	400	0.0	681	695	3.00	2.00	308	1216	0.253	3.0	5.2
Merge Lane	1	-	100.0	Merge Lane is not Opposed				681	1800	0.379	0.0	0.0
East Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: State Hwy MM/ZZ Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: State Hwy M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout



	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [Highway M & FR 103 AM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: High School													
Lane 1[d]	322	2.6	639	0.505	100	13.8	LOS B	2.8	71.3	Full	1600	0.0	0.0
Approach	322	2.6		0.505		13.8	LOS B	2.8	71.3				
East: W State Highway M													
Lane 1[d]	395	4.0	1069	0.370	100	7.2	LOS A	1.8	47.6	Full	1600	0.0	0.0
Lane 2	392	4.8	1061	0.370	100	7.2	LOS A	1.8	47.3	Full	1600	0.0	0.0
Approach	787	4.4		0.370		7.2	LOS A	1.8	47.6				
North: Farm Road 103													
Lane 1[d]	48	3.8	582	0.083	100	7.2	LOS A	0.3	7.0	Full	1600	0.0	0.0
Approach	48	3.8		0.083		7.2	LOS A	0.3	7.0				
West: W Republic Road													
Lane 1	535	2.0	1198	0.447	100	7.6	LOS A	2.7	67.6	Full	1200	0.0	0.0
Lane 2[d]	535	2.0	1198	0.447	100	7.6	LOS A	2.7	67.6	Full	1200	0.0	0.0
Approach	1071	2.0		0.447		7.6	LOS A	2.7	67.6				
Intersection	2229	3.0		0.505		8.4	LOS A	2.8	71.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: High School

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	200	18	104	322	2.6	639	0.505	100	NA	NA
Approach	200	18	104	322	2.6		0.505			

East: W State Highway M

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	135	260	-	395	4.0	1069	0.370	100	NA	NA

Lane 2	-	370	22	392	4.8	1061	0.370	100	NA	NA
Approach	135	630	22	787	4.4		0.370			
North: Farm Road 103										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	16	22	48	3.8	582	0.083	100	NA	NA
Approach	11	16	22	48	3.8		0.083			
West: W Republic Road										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	43	492	-	535	2.0	1198	0.447	100	NA	NA
Lane 2	-	345	190	535	2.0	1198	0.447	100	NA	NA
Approach	43	837	190	1071	2.0		0.447			

	Total	%HV	Deg.Satn (v/c)
Intersection	2229	3.0	0.505

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

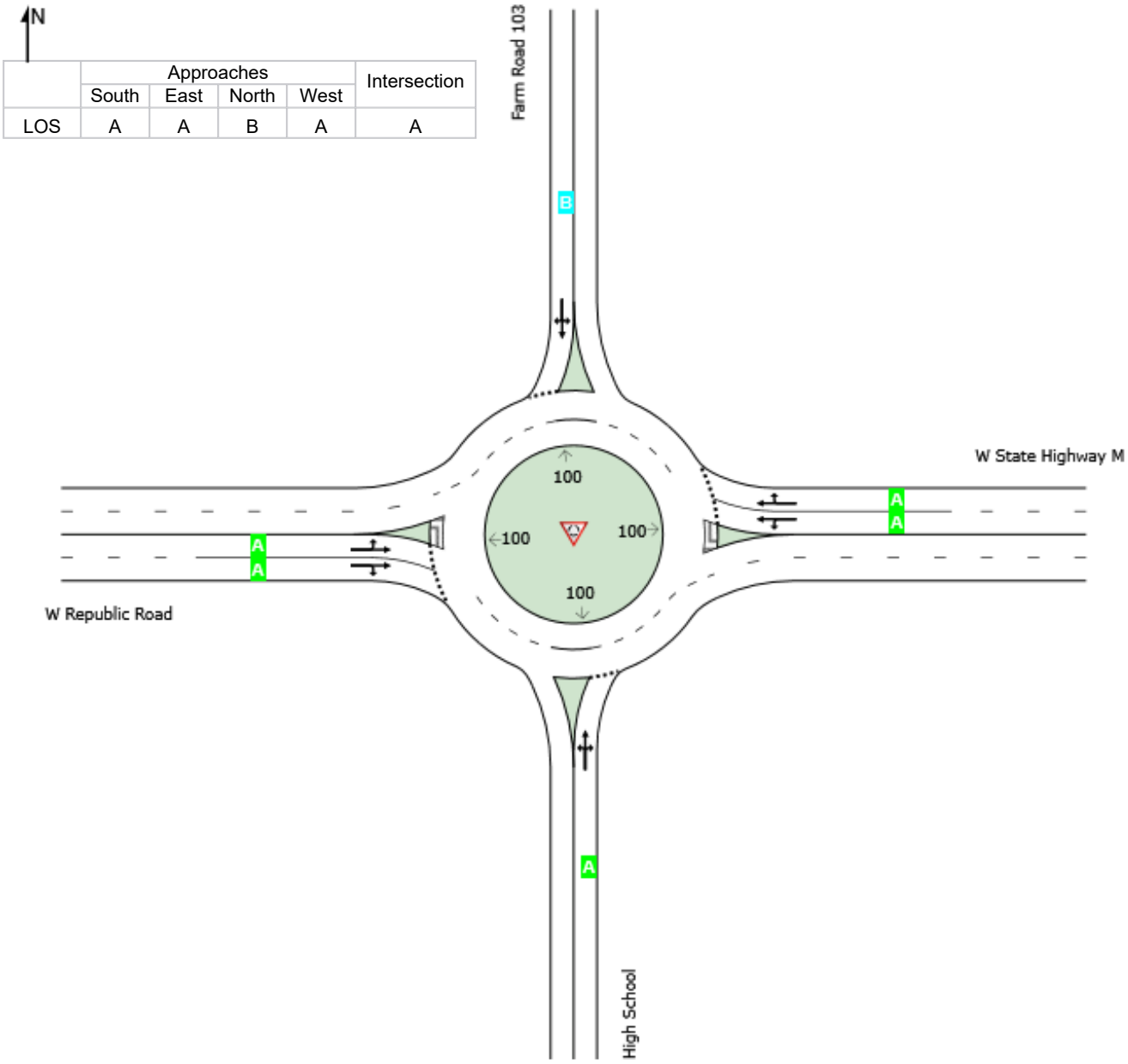
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: High School Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: W State Highway M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Farm Road 103 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: W Republic Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout



	Approaches				Intersection
	South	East	North	West	
LOS	A	A	B	A	A

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Delay Model: HCM Delay Formula (Geometric Delay is not included).

LANE SUMMARY

Site: 101 [Highway M & FR 103 PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: High School													
Lane 1[d]	282	2.0	837	0.336	100	8.1	LOS A	1.4	35.7	Full	1600	0.0	0.0
Approach	282	2.0		0.336		8.1	LOS A	1.4	35.7				
East: W State Highway M													
Lane 1	609	2.0	1126	0.540	100	9.6	LOS A	3.5	88.5	Full	1600	0.0	0.0
Lane 2[d]	609	2.0	1126	0.540	100	9.6	LOS A	3.5	88.5	Full	1600	0.0	0.0
Approach	1217	2.0		0.540		9.6	LOS A	3.5	88.5				
North: Farm Road 103													
Lane 1[d]	67	2.0	413	0.161	100	11.2	LOS B	0.5	13.2	Full	1600	0.0	0.0
Approach	67	2.0		0.161		11.2	LOS B	0.5	13.2				
West: W Republic Road													
Lane 1	347	2.0	1232	0.282	100	5.5	LOS A	1.4	35.3	Full	1200	0.0	0.0
Lane 2[d]	347	2.0	1232	0.282	100	5.5	LOS A	1.4	35.3	Full	1200	0.0	0.0
Approach	695	2.0		0.282		5.5	LOS A	1.4	35.3				
Intersection	2260	2.0		0.540		8.2	LOS A	3.5	88.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: High School

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	194	23	64	282	2.0	837	0.336	100	NA	NA
Approach	194	23	64	282	2.0		0.336			

East: W State Highway M

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	98	511	-	609	2.0	1126	0.540	100	NA	NA

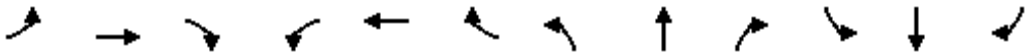
Lane 2	-	598	11	609	2.0	1126	0.540	100	NA	NA
Approach	98	1109	11	1217	2.0		0.540			
North: Farm Road 103										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	12	33	67	2.0	413	0.161	100	NA	NA
Approach	22	12	33	67	2.0		0.161			
West: W Republic Road										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	337	-	347	2.0	1232	0.282	100	NA	NA
Lane 2	-	218	130	347	2.0	1232	0.282	100	NA	NA
Approach	11	554	130	695	2.0		0.282			

	Total	%HV	Deg.Satn (v/c)
Intersection	2260	2.0	0.540

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

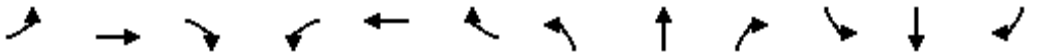
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: High School Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: W State Highway M Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Farm Road 103 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: W Republic Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	33	43	76	22	359	98	1685	130	98	783	43
v/c Ratio	0.49	0.29	0.12	0.39	0.20	0.23	0.27	0.91	0.14	0.52	0.43	0.05
Control Delay	46.4	55.4	0.7	42.5	52.8	0.4	8.4	28.8	0.5	24.2	19.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.4	55.4	0.7	42.5	52.8	0.4	8.4	28.8	0.5	24.2	19.6	0.1
Queue Length 50th (ft)	72	23	0	44	15	0	24	585	0	47	272	0
Queue Length 95th (ft)	128	55	0	86	41	0	m22	#758	3	62	321	1
Internal Link Dist (ft)		485			2182			548			2133	
Turn Bay Length (ft)	150		85	175		250	250		240	200		240
Base Capacity (vph)	247	117	355	195	117	1538	367	1842	920	188	1839	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.28	0.12	0.39	0.19	0.23	0.27	0.91	0.14	0.52	0.43	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



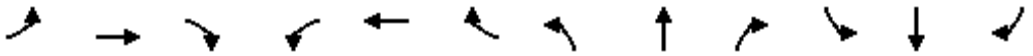
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	30	40	70	20	330	90	1550	120	90	720	40
Future Volume (vph)	110	30	40	70	20	330	90	1550	120	90	720	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2	4.0	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1652	1404	1719	1652	1538	1570	3438	1538	1719	3438	1404
Flt Permitted	1.00	1.00	1.00	0.74	1.00	1.00	0.30	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1652	1652	1404	1331	1652	1538	488	3438	1538	134	3438	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	33	43	76	22	359	98	1685	130	98	783	43
RTOR Reduction (vph)	0	0	39	0	0	0	0	0	66	0	0	22
Lane Group Flow (vph)	120	33	4	76	22	359	98	1685	64	98	783	21
Heavy Vehicles (%)	15%	15%	15%	5%	15%	5%	15%	5%	5%	5%	5%	15%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Free	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8		Free	6		2	2		6
Actuated Green, G (s)	17.1	10.9	10.9	17.1	3.1	110.0	61.5	54.1	54.1	61.5	54.0	54.0
Effective Green, g (s)	17.1	10.9	10.9	17.1	3.1	110.0	61.5	54.1	54.1	61.5	54.0	54.0
Actuated g/C Ratio	0.16	0.10	0.10	0.16	0.03	1.00	0.56	0.49	0.49	0.56	0.49	0.49
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2		7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	246	163	139	228	46	1538	346	1690	756	181	1687	689
v/s Ratio Prot	c0.06	0.02		0.02	0.01		0.02	c0.49		0.04	c0.23	
v/s Ratio Perm	0.01		0.00	0.03		c0.23	0.14		0.04	0.27		0.02
v/c Ratio	0.49	0.20	0.03	0.33	0.48	0.23	0.28	1.00	0.08	0.54	0.46	0.03
Uniform Delay, d1	42.5	45.6	44.8	41.0	52.7	0.0	18.1	27.9	14.8	22.4	18.5	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.83	1.79	1.02	1.16	1.00
Incremental Delay, d2	1.8	0.7	0.1	1.0	9.0	0.4	0.5	19.7	0.2	3.5	0.9	0.1
Delay (s)	44.3	46.3	44.9	42.1	61.6	0.4	13.3	42.9	26.7	26.3	22.2	14.6
Level of Service	D	D	D	D	E	A	B	D	C	C	C	B
Approach Delay (s)		44.7			10.2			40.3			22.3	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	54	1641	707	370	1087
v/c Ratio	0.10	0.24	0.73	0.61	0.75	0.38
Control Delay	50.3	2.5	4.5	2.1	56.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	2.5	4.5	2.1	56.4	0.9
Queue Length 50th (ft)	7	0	86	0	145	33
Queue Length 95th (ft)	26	0	m97	m0	#195	23
Internal Link Dist (ft)		1239	2133			639
Turn Bay Length (ft)	140			270	275	
Base Capacity (vph)	313	344	2243	1152	495	2869
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.16	0.73	0.61	0.75	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



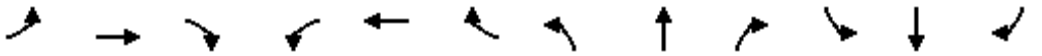
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	50	0	0	0	0	1510	650	340	1000	0
Future Volume (vph)	10	0	50	0	0	0	0	1510	650	340	1000	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00						0.95	1.00	0.97	0.95	
Frt	1.00	0.85						1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1205						3282	1404	3303	3252	
Flt Permitted	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1205						3282	1404	3303	3252	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	54	0	0	0	0	1641	707	370	1087	0
RTOR Reduction (vph)	0	51	0	0	0	0	0	0	198	0	0	0
Lane Group Flow (vph)	11	3	0	0	0	0	0	1641	509	370	1087	0
Heavy Vehicles (%)	2%	2%	34%	2%	2%	2%	2%	10%	15%	6%	11%	2%
Turn Type	Split	NA						NA	Perm	Prot	NA	
Protected Phases	4	4						2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	5.7	5.7						74.3	74.3	16.5	95.3	
Effective Green, g (s)	5.7	5.7						74.3	74.3	16.5	95.3	
Actuated g/C Ratio	0.05	0.05						0.68	0.68	0.15	0.87	
Clearance Time (s)	4.5	4.5						4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	91	62						2216	948	495	2817	
v/s Ratio Prot	c0.01	0.00						c0.50		c0.11	0.33	
v/s Ratio Perm									0.36			
v/c Ratio	0.12	0.05						0.74	0.54	0.75	0.39	
Uniform Delay, d1	49.8	49.6						11.6	9.1	44.8	1.5	
Progression Factor	1.00	1.00						0.25	0.27	1.08	0.37	
Incremental Delay, d2	0.6	0.3						1.6	1.5	4.7	0.3	
Delay (s)	50.4	49.9						4.5	4.0	53.0	0.9	
Level of Service	D	D						A	A	D	A	
Approach Delay (s)		49.9			0.0			4.3			14.1	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	152	261	87	1565	1304	11
v/c Ratio	0.65	0.53	0.43	0.65	0.67	0.01
Control Delay	56.4	26.3	8.0	1.3	20.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	26.3	8.0	1.3	20.0	0.0
Queue Length 50th (ft)	102	51	2	6	340	0
Queue Length 95th (ft)	161	92	m10	9	479	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	334	655	210	2399	1958	971
Starvation Cap Reductn	0	0	0	52	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.40	0.41	0.67	0.67	0.01

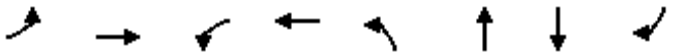
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



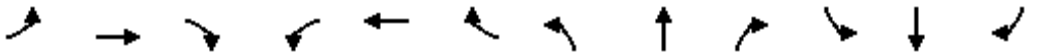
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	140	0	240	80	1440	0	0	1200	10
Future Volume (vph)	0	0	0	140	0	240	80	1440	0	0	1200	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		0.88	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1612		2707	1195	3374			3374	1583
Flt Permitted				0.95		1.00	0.14	1.00			1.00	1.00
Satd. Flow (perm)				1612		2707	173	3374			3374	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	152	0	261	87	1565	0	0	1304	11
RTOR Reduction (vph)	0	0	0	0	0	102	0	0	0	0	0	5
Lane Group Flow (vph)	0	0	0	152	0	159	87	1565	0	0	1304	6
Heavy Vehicles (%)	2%	2%	2%	12%	2%	5%	51%	7%	2%	2%	7%	2%
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				16.1		16.1	70.7	78.2			62.3	62.3
Effective Green, g (s)				16.1		16.1	70.7	78.2			62.3	62.3
Actuated g/C Ratio				0.15		0.15	0.64	0.71			0.57	0.57
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				235		396	189	2398			1910	896
v/s Ratio Prot				c0.09			0.04	c0.46			0.39	
v/s Ratio Perm						0.06	0.26					0.00
v/c Ratio				0.65		0.40	0.46	0.65			0.68	0.01
Uniform Delay, d1				44.3		42.6	25.3	8.6			16.9	10.4
Progression Factor				1.00		1.00	0.22	0.04			1.00	1.00
Incremental Delay, d2				6.3		0.8	1.4	0.9			2.0	0.0
Delay (s)				50.5		43.4	6.9	1.2			18.9	10.4
Level of Service				D		D	A	A			B	B
Approach Delay (s)		0.0			46.0			1.5			18.8	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	13	20	3	12	58	1743	859	35
v/c Ratio	0.09	0.05	0.02	0.03	0.11	0.58	0.38	0.03
Control Delay	43.2	0.2	40.7	0.2	4.4	6.0	1.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	0.2	40.7	0.2	4.4	6.0	1.8	0.0
Queue Length 50th (ft)	9	0	2	0	1	0	8	0
Queue Length 95th (ft)	24	0	10	0	28	534	52	0
Internal Link Dist (ft)		347		749		490	984	
Turn Bay Length (ft)			30		200			240
Base Capacity (vph)	150	434	153	367	526	2997	2285	1243
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.02	0.03	0.11	0.58	0.38	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	18	3	0	11	53	1600	4	0	790	32
Future Volume (vph)	12	0	18	3	0	11	53	1600	4	0	790	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1583		1770	3373			3034	1583
Flt Permitted	1.00	1.00		1.00	1.00		0.30	1.00			1.00	1.00
Satd. Flow (perm)	1863	1583		1863	1583		556	3373			3034	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	0	20	3	0	12	58	1739	4	0	859	35
RTOR Reduction (vph)	0	19	0	0	12	0	0	0	0	0	0	13
Lane Group Flow (vph)	13	1	0	3	0	0	58	1743	0	0	859	22
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	2%	2%	19%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	4.4	3.0		4.4	2.8		74.2	81.7			68.3	68.3
Effective Green, g (s)	4.4	3.0		4.4	2.8		74.2	81.7			68.3	68.3
Actuated g/C Ratio	0.04	0.03		0.04	0.03		0.67	0.74			0.62	0.62
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5			7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0			4.0	4.0
Lane Grp Cap (vph)	73	43		73	40		440	2505			1883	982
v/s Ratio Prot	c0.00	0.00		0.00	0.00		0.01	c0.52			0.28	
v/s Ratio Perm	c0.00			0.00			0.08					0.01
v/c Ratio	0.18	0.01		0.04	0.01		0.13	0.70			0.46	0.02
Uniform Delay, d1	51.1	52.1		50.8	52.2		6.2	7.5			11.0	8.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			0.16	1.00
Incremental Delay, d2	1.4	0.1		0.3	0.1		0.2	1.6			0.8	0.0
Delay (s)	52.5	52.2		51.1	52.3		6.4	9.2			2.6	8.1
Level of Service	D	D		D	D		A	A			A	A
Approach Delay (s)		52.3			52.1			9.1			2.8	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

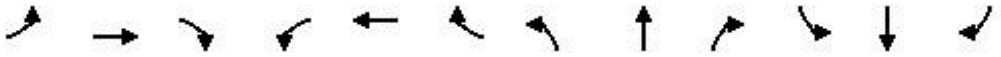
Queues

11: Old Rt MM & W Farm Road 160 & Rt MM

11/17/2021

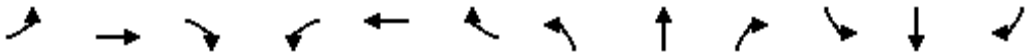
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	98	11	98	1565	11	54	772	142
v/c Ratio	0.67	0.38	0.06	0.36	0.62	0.12	0.38	0.38	0.14
Control Delay	61.6	43.4	38.0	44.6	1.6	48.7	48.2	13.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	43.4	38.0	44.6	1.6	48.7	48.2	13.5	0.3
Queue Length 50th (ft)	81	60	7	63	13	7	30	93	0
Queue Length 95th (ft)	136	105	22	107	32	25	69	141	0
Internal Link Dist (ft)		274		1320			2664		438
Turn Bay Length (ft)	150		150		250	150		250	
Base Capacity (vph)	237	340	245	354	2542	208	302	2051	1033
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.29	0.04	0.28	0.62	0.05	0.18	0.38	0.14

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	80	10	10	90	1440	10	40	10	710	20	110
Future Volume (vph)	110	80	10	10	90	1440	10	40	10	710	20	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		7.5	7.5	7.5	7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88	1.00	1.00		0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1831		1770	1863	2787	1770	1751		3433	1386	
Flt Permitted	0.69	1.00		0.69	1.00	1.00	0.67	1.00		0.95	1.00	
Satd. Flow (perm)	1292	1831		1292	1863	2787	1241	1751		3433	1386	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	87	11	11	98	1565	11	43	11	772	22	120
RTOR Reduction (vph)	0	4	0	0	0	374	0	9	0	0	34	0
Lane Group Flow (vph)	120	94	0	11	98	1191	11	45	0	772	108	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	6%	2%	2%	18%	20%
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		Prot	NA	
Protected Phases		8			4	1		2		1	6	
Permitted Phases	8			4		4	2					
Actuated Green, G (s)	15.4	15.4		16.1	16.1	80.3	7.2	7.2		64.2	78.9	
Effective Green, g (s)	15.4	15.4		16.1	16.1	80.3	7.2	7.2		64.2	78.9	
Actuated g/C Ratio	0.14	0.14		0.15	0.15	0.73	0.07	0.07		0.58	0.72	
Clearance Time (s)	8.2	8.2		7.5	7.5	7.5	7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	256		189	272	2224	81	114		2003	994	
v/s Ratio Prot		0.05			0.05	c0.31		c0.03		0.22	0.08	
v/s Ratio Perm	0.09			0.01		0.11	0.01					
v/c Ratio	0.67	0.37		0.06	0.36	0.54	0.14	0.39		0.39	0.11	
Uniform Delay, d1	44.9	42.9		40.4	42.3	6.6	48.5	49.3		12.3	4.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	0.01	
Incremental Delay, d2	9.0	0.9		0.1	0.8	0.2	0.8	2.2		0.5	0.0	
Delay (s)	53.8	43.8		40.6	43.1	6.8	49.2	51.5		12.4	0.1	
Level of Service	D	D		D	D	A	D	D		B	A	
Approach Delay (s)		49.3			9.2			51.1			10.5	
Approach LOS		D			A			D			B	

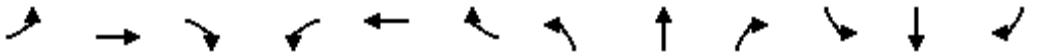
Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	86	2620	370	11	1228	58	261	59	33	86	59	58
v/c Ratio	0.61	0.81	0.35	0.13	0.45	0.06	0.74	0.27	0.10	0.32	0.50	0.19
Control Delay	96.5	6.4	1.1	101.2	10.5	0.1	77.4	62.2	0.6	51.5	83.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.5	6.4	1.1	101.2	10.5	0.1	77.4	62.2	0.6	51.5	83.0	1.4
Queue Length 50th (ft)	84	9	0	12	87	0	128	52	0	69	57	0
Queue Length 95th (ft)	m95	464	m17	m20	250	m0	177	100	0	120	109	0
Internal Link Dist (ft)		2582			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	171	3229	1068	82	2711	934	394	249	361	271	118	304
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.81	0.35	0.13	0.45	0.06	0.66	0.24	0.09	0.32	0.50	0.19

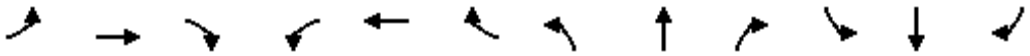
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	2410	340	10	1130	53	240	54	30	79	54	53
Future Volume (vph)	79	2410	340	10	1130	53	240	54	30	79	54	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	5036	1538	1770	4893	1495	3273	1863	1583	1719	1845	1369
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1719	5036	1538	1770	4893	1495	3273	1863	1583	1300	1845	1369
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	2620	370	11	1228	58	261	59	33	86	59	58
RTOR Reduction (vph)	0	0	90	0	0	26	0	0	30	0	0	54
Lane Group Flow (vph)	86	2620	280	11	1228	32	261	59	3	86	59	4
Heavy Vehicles (%)	5%	3%	5%	2%	6%	8%	7%	2%	2%	5%	3%	18%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2	2		6
Actuated Green, G (s)	12.3	91.0	91.0	2.8	81.5	81.5	16.3	15.7	15.7	27.5	11.2	11.2
Effective Green, g (s)	12.3	91.0	91.0	2.8	81.5	81.5	16.3	15.7	15.7	27.5	11.2	11.2
Actuated g/C Ratio	0.08	0.61	0.61	0.02	0.54	0.54	0.11	0.10	0.10	0.18	0.07	0.07
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	140	3055	933	33	2658	812	355	194	165	271	137	102
v/s Ratio Prot	c0.05	c0.52		0.01	0.25		c0.08	0.03		0.02	c0.03	
v/s Ratio Perm			0.18			0.02			0.00	c0.03		0.00
v/c Ratio	0.61	0.86	0.30	0.33	0.46	0.04	0.74	0.30	0.02	0.32	0.43	0.04
Uniform Delay, d1	66.6	24.2	14.2	72.7	20.9	16.0	64.8	62.1	60.3	52.7	66.4	64.4
Progression Factor	1.31	0.24	0.13	1.43	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.8	0.4	6.5	0.5	0.1	7.7	1.2	0.1	0.8	2.9	0.2
Delay (s)	91.0	7.5	2.2	110.1	10.7	16.1	72.5	63.3	60.3	53.5	69.3	64.7
Level of Service	F	A	A	F	B	B	E	E	E	D	E	E
Approach Delay (s)		9.2			11.8			69.8			61.3	
Approach LOS		A			B			E			E	

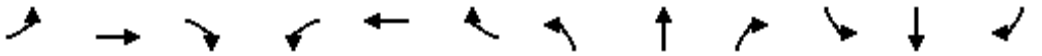
Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.7
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	804	1880	87	185	837	424	22	576	239	457	315	457
v/c Ratio	0.93	0.91	0.12	0.87	0.70	0.76	0.07	0.92	0.51	0.89	0.36	0.56
Control Delay	57.6	31.1	0.7	94.1	85.8	62.7	30.0	80.7	10.8	82.7	41.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	31.1	0.7	94.1	85.8	62.7	30.0	80.7	10.8	82.7	41.8	6.3
Queue Length 50th (ft)	362	683	0	127	315	273	13	294	5	228	166	0
Queue Length 95th (ft)	#497	666	m0	#220	365	383	34	#398	85	#316	226	89
Internal Link Dist (ft)		2846			3068			693			603	
Turn Bay Length (ft)	400		410	385		410	500		500	500		500
Base Capacity (vph)	892	2064	750	213	1193	558	331	637	476	526	887	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.91	0.12	0.87	0.70	0.76	0.07	0.90	0.50	0.87	0.36	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	740	1730	80	170	770	390	20	530	220	420	290	420
Future Volume (vph)	740	1730	80	170	770	390	20	530	220	420	290	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	*0.75	0.91	1.00	1.00	0.95	1.00	0.97	*0.75	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	2654	5085	1583	1770	3539	1583	3433	2794	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.45	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	2654	5085	1583	831	3539	1583	3433	2794	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	804	1880	87	185	837	424	22	576	239	457	315	457
RTOR Reduction (vph)	0	0	53	0	0	191	0	0	187	0	0	312
Lane Group Flow (vph)	804	1880	34	185	837	233	22	576	52	457	315	145
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2			6
Actuated Green, G (s)	37.7	58.1	58.1	12.0	32.4	32.4	51.9	29.5	29.5	22.4	47.7	47.7
Effective Green, g (s)	37.7	58.1	58.1	12.0	32.4	32.4	51.9	29.5	29.5	22.4	47.7	47.7
Actuated g/C Ratio	0.25	0.39	0.39	0.08	0.22	0.22	0.35	0.20	0.20	0.15	0.32	0.32
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	862	1969	613	212	1098	341	313	696	311	512	888	503
v/s Ratio Prot	c0.23	c0.37		0.07	0.16		0.00	c0.16		c0.13	0.11	
v/s Ratio Perm			0.02			0.15	0.02		0.03			0.09
v/c Ratio	0.93	0.95	0.05	0.87	0.76	0.68	0.07	0.83	0.17	0.89	0.35	0.29
Uniform Delay, d1	54.9	44.7	28.8	68.2	55.2	54.1	32.6	57.8	50.0	62.6	39.3	38.4
Progression Factor	0.82	0.61	1.00	0.89	1.55	2.37	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.6	8.5	0.1	28.7	4.7	9.9	0.1	8.0	0.3	17.6	0.2	0.3
Delay (s)	56.6	35.7	28.9	89.3	90.1	137.8	32.7	65.8	50.3	80.3	39.6	38.7
Level of Service	E	D	C	F	F	F	C	E	D	F	D	D
Approach Delay (s)		41.6			104.0			60.5			54.4	
Approach LOS		D			F			E			D	

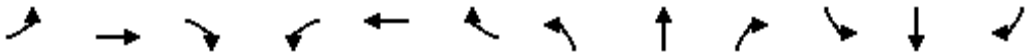
Intersection Summary			
HCM 2000 Control Delay	61.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

34: Rt ZZ/Rt M/MM Corridor & Rt M

10/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	33	380	43	228	326	185	43	609	391	185	380	11
v/c Ratio	0.11	0.96	0.09	1.02	0.64	0.12	0.11	0.93	0.52	0.91	0.50	0.01
Control Delay	22.2	75.9	0.4	94.4	40.7	0.2	13.8	54.1	8.7	65.6	26.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	75.9	0.4	94.4	40.7	0.2	13.8	54.1	8.7	65.6	26.0	0.0
Queue Length 50th (ft)	14	242	0	~110	198	0	13	364	38	63	191	0
Queue Length 95th (ft)	34	#426	0	#246	#340	0	31	#577	116	#194	287	0
Internal Link Dist (ft)		1544			1207			1360			1261	
Turn Bay Length (ft)	260		260	475		250	230		230	230		230
Base Capacity (vph)	296	397	475	224	510	1583	410	680	770	203	762	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.96	0.09	1.02	0.64	0.12	0.10	0.90	0.51	0.91	0.50	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis

34: Rt ZZ/Rt M/MM Corridor & Rt M

10/07/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	350	40	210	300	170	40	560	360	170	350	10
Future Volume (vph)	30	350	40	210	300	170	40	560	360	170	350	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	4.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1509	1752	1810	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.36	1.00	1.00	0.21	1.00	1.00	0.40	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	674	1863	1509	387	1810	1583	749	1863	1583	222	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	380	43	228	326	185	43	609	391	185	380	11
RTOR Reduction (vph)	0	0	33	0	0	0	0	0	194	0	0	7
Lane Group Flow (vph)	33	380	10	228	326	185	43	609	197	185	380	4
Heavy Vehicles (%)	2%	2%	7%	3%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Free	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8		Free	6		2	2		6
Actuated Green, G (s)	31.9	23.9	23.9	31.9	27.8	104.4	44.5	37.5	37.5	44.5	40.4	40.4
Effective Green, g (s)	31.9	23.9	23.9	31.9	27.8	104.4	44.5	37.5	37.5	44.5	40.4	40.4
Actuated g/C Ratio	0.31	0.23	0.23	0.31	0.27	1.00	0.43	0.36	0.36	0.43	0.39	0.39
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	426	345	222	481	1583	359	669	568	198	720	612
v/s Ratio Prot	0.01	0.20		c0.08	c0.18		0.00	0.33		c0.06	0.20	
v/s Ratio Perm	0.04		0.01	c0.23		c0.12	0.05		0.12	c0.34		0.00
v/c Ratio	0.13	0.89	0.03	1.03	0.68	0.12	0.12	0.91	0.35	0.93	0.53	0.01
Uniform Delay, d1	26.1	39.0	31.2	33.5	34.3	0.0	18.1	31.8	24.5	23.8	24.7	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	20.3	0.0	67.6	3.8	0.2	0.2	16.6	0.4	45.3	0.7	0.0
Delay (s)	26.4	59.3	31.3	101.1	38.1	0.2	18.3	48.4	24.9	69.1	25.4	19.7
Level of Service	C	E	C	F	D	A	B	D	C	E	C	B
Approach Delay (s)		54.3			48.0			38.3			39.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	104.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

34: Rt ZZ/Rt M/MM Corridor & Rt M

10/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	380	43	228	326	185	43	609	391	185	391
v/c Ratio	0.08	0.81	0.08	0.58	0.50	0.27	0.11	0.74	0.25	0.65	0.34
Control Delay	16.5	48.3	0.3	48.2	29.1	5.1	19.6	39.7	0.4	32.8	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	48.3	0.3	48.2	29.1	5.1	19.6	39.7	0.4	32.8	27.8
Queue Length 50th (ft)	11	217	0	68	166	0	16	181	0	74	104
Queue Length 95th (ft)	31	353	0	121	280	49	40	260	0	#136	158
Internal Link Dist (ft)		1544			1207			1360			1261
Turn Bay Length (ft)	260		260	475		250	230		230	230	
Base Capacity (vph)	401	627	627	443	713	736	396	1154	1583	290	1248
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.61	0.07	0.51	0.46	0.25	0.11	0.53	0.25	0.64	0.31

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

34: Rt ZZ/Rt M/MM Corridor & Rt M

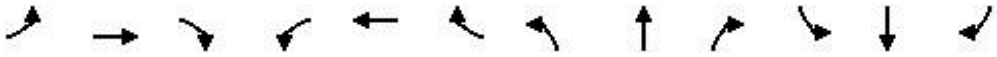
10/07/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	350	40	210	300	170	40	560	360	170	350	10
Future Volume (vph)	30	350	40	210	300	170	40	560	360	170	350	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1509	3400	1810	1583	1770	3539	1583	1770	3524	
Flt Permitted	0.44	1.00	1.00	0.95	1.00	1.00	0.49	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	816	1863	1509	3400	1810	1583	907	3539	1583	500	3524	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	380	43	228	326	185	43	609	391	185	380	11
RTOR Reduction (vph)	0	0	31	0	0	122	0	0	0	0	2	0
Lane Group Flow (vph)	33	380	12	228	326	63	43	609	391	185	389	0
Heavy Vehicles (%)	2%	2%	7%	3%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	D.P+P	NA	Perm	Prot	NA	Perm	D.P+P	NA	Free	D.P+P	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8			4	6		Free	2		
Actuated Green, G (s)	37.8	27.0	27.0	10.8	34.1	34.1	34.2	25.3	100.0	34.2	30.4	
Effective Green, g (s)	37.8	27.0	27.0	10.8	34.1	34.1	34.2	25.3	100.0	34.2	30.4	
Actuated g/C Ratio	0.38	0.27	0.27	0.11	0.34	0.34	0.34	0.25	1.00	0.34	0.30	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	503	407	367	617	539	342	895	1583	284	1071	
v/s Ratio Prot	0.00	c0.20		c0.07	c0.18		0.00	c0.17		c0.06	0.11	
v/s Ratio Perm	0.03		0.01			0.04	0.04		c0.25	0.16		
v/c Ratio	0.10	0.76	0.03	0.62	0.53	0.12	0.13	0.68	0.25	0.65	0.36	
Uniform Delay, d1	20.0	33.5	26.9	42.6	26.5	22.6	22.2	33.7	0.0	24.7	27.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	6.4	0.0	3.3	0.8	0.1	0.2	2.1	0.4	5.3	0.2	
Delay (s)	20.1	39.8	26.9	45.9	27.3	22.7	22.4	35.8	0.4	30.0	27.4	
Level of Service	C	D	C	D	C	C	C	D	A	C	C	
Approach Delay (s)		37.2			31.9			22.0			28.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Rt M/MM Corridor & W Farm Road 156

12/09/2021

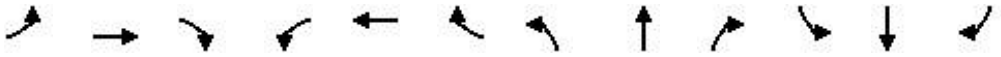


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	185	54	65	87	33	391	65	1120	87	141	1185	65
v/c Ratio	0.68	0.20	0.14	0.27	0.15	0.87	0.34	0.73	0.11	0.60	0.71	0.08
Control Delay	46.9	42.1	0.7	30.9	40.9	33.8	19.1	23.8	0.4	22.7	11.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	42.1	0.7	30.9	40.9	33.8	19.1	23.8	0.4	22.7	11.9	0.2
Queue Length 50th (ft)	105	34	0	46	21	79	16	364	1	27	233	0
Queue Length 95th (ft)	163	70	0	82	48	#205	26	111	0	#108	405	m0
Internal Link Dist (ft)		485			2182			548			2133	
Turn Bay Length (ft)	150		85	175		250	250		240	200		240
Base Capacity (vph)	274	307	485	326	297	510	192	1530	802	235	1658	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.18	0.13	0.27	0.11	0.77	0.34	0.73	0.11	0.60	0.71	0.08

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	50	60	80	30	360	60	1030	80	130	1090	60
Future Volume (vph)	170	50	60	80	30	360	60	1030	80	130	1090	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2	8.2	8.2	8.2	8.2	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1570	1652	1404	1770	1652	1583	1570	3539	1583	1770	3539	1404
Flt Permitted	0.74	1.00	1.00	0.72	1.00	1.00	0.11	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	1215	1652	1404	1345	1652	1583	189	3539	1583	229	3539	1404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	54	65	87	33	391	65	1120	87	141	1185	65
RTOR Reduction (vph)	0	0	54	0	0	234	0	0	51	0	0	36
Lane Group Flow (vph)	185	54	11	87	33	157	65	1120	36	141	1185	29
Heavy Vehicles (%)	15%	15%	15%	2%	15%	2%	15%	2%	2%	2%	2%	15%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8		4	6		2	2		6
Actuated Green, G (s)	24.2	18.0	18.0	24.2	16.4	16.4	54.4	45.9	45.9	54.4	48.4	48.4
Effective Green, g (s)	24.2	18.0	18.0	24.2	16.4	16.4	54.4	45.9	45.9	54.4	48.4	48.4
Actuated g/C Ratio	0.22	0.16	0.16	0.22	0.15	0.15	0.49	0.42	0.42	0.49	0.44	0.44
Clearance Time (s)	8.2	8.2	8.2	8.2	8.2	8.2	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	292	270	229	319	246	236	168	1476	660	232	1557	617
v/s Ratio Prot	c0.04	0.03		0.02	0.02		0.02	c0.32		0.05	c0.33	
v/s Ratio Perm	0.09		0.01	0.04		c0.10	0.17		0.02	0.25		0.02
v/c Ratio	0.63	0.20	0.05	0.27	0.13	0.67	0.39	0.76	0.06	0.61	0.76	0.05
Uniform Delay, d1	38.1	39.8	38.8	35.2	40.6	44.2	35.5	27.3	19.1	18.9	25.9	17.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.64	0.77	1.00	0.89	0.36	1.00
Incremental Delay, d2	4.6	0.4	0.1	0.5	0.3	7.2	1.6	3.5	0.1	4.0	3.1	0.1
Delay (s)	42.7	40.2	38.9	35.7	40.9	51.4	24.3	24.4	19.3	20.8	12.5	17.7
Level of Service	D	D	D	D	D	D	C	C	B	C	B	B
Approach Delay (s)		41.5			48.0			24.0			13.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	82	1098	620	511	1609
v/c Ratio	0.10	0.38	0.57	0.58	0.73	0.55
Control Delay	50.3	8.6	11.9	3.6	44.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	50.3	8.6	11.9	3.6	44.9	2.0
Queue Length 50th (ft)	7	0	221	19	201	66
Queue Length 95th (ft)	26	21	301	50	m222	m72
Internal Link Dist (ft)		1239	2133			639
Turn Bay Length (ft)	140			270	275	
Base Capacity (vph)	238	315	1937	1073	702	2950
Starvation Cap Reductn	0	0	0	0	0	769
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.26	0.57	0.58	0.73	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	75	0	0	0	0	1010	570	470	1480	0
Future Volume (vph)	10	0	75	0	0	0	0	1010	570	470	1480	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2						7.5	7.5	7.5	7.5	
Lane Util. Factor	1.00	1.00						0.95	1.00	0.97	0.95	
Frt	1.00	0.85						1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583						3539	1583	3433	3539	
Flt Permitted	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583						3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	82	0	0	0	0	1098	620	511	1609	0
RTOR Reduction (vph)	0	78	0	0	0	0	0	0	213	0	0	0
Lane Group Flow (vph)	11	4	0	0	0	0	0	1098	407	511	1609	0
Turn Type	Split	NA						NA	Perm	Prot	NA	
Protected Phases	4	4						2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	5.7	5.7						58.6	58.6	22.5	88.6	
Effective Green, g (s)	5.7	5.7						58.6	58.6	22.5	88.6	
Actuated g/C Ratio	0.05	0.05						0.53	0.53	0.20	0.81	
Clearance Time (s)	8.2	8.2						7.5	7.5	7.5	7.5	
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	91	82						1885	843	702	2850	
v/s Ratio Prot	c0.01	0.00						0.31		c0.15	c0.45	
v/s Ratio Perm									0.26			
v/c Ratio	0.12	0.05						0.58	0.48	0.73	0.56	
Uniform Delay, d1	49.8	49.6						17.4	16.2	40.9	3.8	
Progression Factor	1.00	1.00						0.64	0.46	1.02	0.32	
Incremental Delay, d2	0.6	0.3						0.9	1.3	1.6	0.3	
Delay (s)	50.4	49.8						12.0	8.8	43.3	1.6	
Level of Service	D	D						B	A	D	A	
Approach Delay (s)		49.9			0.0			10.8			11.6	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	217	391	54	1043	1902	22
v/c Ratio	0.79	0.60	0.27	0.42	0.92	0.02
Control Delay	64.6	18.1	15.3	0.5	31.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.6	18.1	15.3	0.5	31.1	0.1
Queue Length 50th (ft)	146	46	9	1	668	0
Queue Length 95th (ft)	#249	99	m33	1	#871	0
Internal Link Dist (ft)				639	1613	
Turn Bay Length (ft)	325	325	250			50
Base Capacity (vph)	302	691	204	2480	2068	977
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.26	0.42	0.92	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	0	360	50	960	0	0	1750	20
Future Volume (vph)	0	0	0	200	0	360	50	960	0	0	1750	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Lane Util. Factor				1.00		0.88	1.00	0.95			0.95	1.00
Frt				1.00		0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95		1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770		2787	1770	3539			3539	1583
Flt Permitted				0.95		1.00	0.06	1.00			1.00	1.00
Satd. Flow (perm)				1770		2787	119	3539			3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	217	0	391	54	1043	0	0	1902	22
RTOR Reduction (vph)	0	0	0	0	0	219	0	0	0	0	0	9
Lane Group Flow (vph)	0	0	0	217	0	172	54	1043	0	0	1902	13
Turn Type				Prot		Perm	D.P+P	NA			NA	Perm
Protected Phases				7			5	2			6	
Permitted Phases						7	6					6
Actuated Green, G (s)				17.2		17.2	69.6	77.1			62.8	62.8
Effective Green, g (s)				17.2		17.2	69.6	77.1			62.8	62.8
Actuated g/C Ratio				0.16		0.16	0.63	0.70			0.57	0.57
Clearance Time (s)				8.2		8.2	7.5	7.5			7.5	7.5
Vehicle Extension (s)				3.5		3.5	3.5	4.0			4.0	4.0
Lane Grp Cap (vph)				276		435	177	2480			2020	903
v/s Ratio Prot				c0.12			0.02	c0.29			c0.54	
v/s Ratio Perm						0.06	0.17					0.01
v/c Ratio				0.79		0.39	0.31	0.42			0.94	0.01
Uniform Delay, d1				44.6		41.7	41.9	7.0			21.9	10.2
Progression Factor				1.00		1.00	0.73	0.01			1.00	1.00
Incremental Delay, d2				14.1		0.7	1.0	0.4			10.3	0.0
Delay (s)				58.7		42.4	31.7	0.5			32.2	10.2
Level of Service				E		D	C	A			C	B
Approach Delay (s)		0.0			48.2			2.0			32.0	
Approach LOS		A			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	55	80	9	9	60	1173	4	1242	36
v/c Ratio	0.38	0.22	0.07	0.03	0.19	0.43	0.01	0.51	0.03
Control Delay	51.5	1.3	42.1	0.1	6.1	8.1	3.5	4.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	1.3	42.1	0.1	6.1	8.1	3.5	4.0	0.0
Queue Length 50th (ft)	38	0	6	0	8	112	0	58	0
Queue Length 95th (ft)	68	0	19	0	29	378	m1	104	m0
Internal Link Dist (ft)		347		749		490		984	
Turn Bay Length (ft)			30		200		250		240
Base Capacity (vph)	149	374	142	353	324	2737	375	2454	1161
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.06	0.03	0.19	0.43	0.01	0.51	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	0	74	8	0	8	55	1075	5	4	1143	33
Future Volume (vph)	51	0	74	8	0	8	55	1075	5	4	1143	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1380		1770	3537		1770	3539	1583
Flt Permitted	1.00	1.00		0.70	1.00		0.16	1.00		0.19	1.00	1.00
Satd. Flow (perm)	1863	1583		1313	1380		303	3537		361	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	0	80	9	0	9	60	1168	5	4	1242	36
RTOR Reduction (vph)	0	76	0	0	9	0	0	0	0	0	0	15
Lane Group Flow (vph)	55	4	0	9	0	0	60	1173	0	4	1242	21
Heavy Vehicles (%)	2%	2%	2%	2%	2%	17%	2%	2%	2%	2%	2%	2%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4			8			6			2		6
Actuated Green, G (s)	7.6	6.1		7.6	1.4		71.0	69.5		71.0	65.1	65.1
Effective Green, g (s)	7.6	6.1		7.6	1.4		71.0	69.5		71.0	65.1	65.1
Actuated g/C Ratio	0.07	0.06		0.07	0.01		0.65	0.63		0.65	0.59	0.59
Clearance Time (s)	8.2	8.2		8.2	8.2		7.5	7.5		7.5	7.5	7.5
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.5	4.0		3.5	4.0	4.0
Lane Grp Cap (vph)	123	87		96	17		274	2234		252	2094	936
v/s Ratio Prot	c0.03	0.00		0.00	0.00		0.01	c0.33		0.00	c0.35	
v/s Ratio Perm	c0.01			c0.01			0.13			0.01		0.01
v/c Ratio	0.45	0.05		0.09	0.01		0.22	0.52		0.02	0.59	0.02
Uniform Delay, d1	49.2	49.2		47.9	53.6		8.9	11.2		12.7	14.1	9.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.66	0.29	1.00
Incremental Delay, d2	3.0	0.3		0.5	0.2		0.5	0.9		0.0	0.9	0.0
Delay (s)	52.3	49.5		48.4	53.8		9.4	12.0		8.4	5.1	9.3
Level of Service	D	D		D	D		A	B		A	A	A
Approach Delay (s)		50.6			51.1			11.9			5.2	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	31.4
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

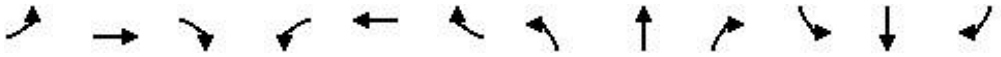
Queues

11: Old Rt MM & W Farm Road 160 & Rt MM

11/17/2021

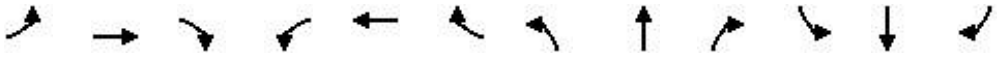
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	163	11	65	1043	11	44	1141	196
v/c Ratio	0.73	0.56	0.05	0.22	0.42	0.14	0.31	0.59	0.19
Control Delay	62.2	47.1	33.9	37.6	0.7	51.2	44.2	13.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	47.1	33.9	37.6	0.7	51.2	44.2	13.6	0.4
Queue Length 50th (ft)	102	104	6	39	0	7	23	97	0
Queue Length 95th (ft)	161	159	21	73	13	26	57	166	0
Internal Link Dist (ft)		274		1320			2664		438
Turn Bay Length (ft)	150		150		250	150		250	
Base Capacity (vph)	298	415	302	428	2490	166	294	1943	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.39	0.04	0.15	0.42	0.07	0.15	0.59	0.19

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	140	10	10	60	960	10	30	10	1050	20	160
Future Volume (vph)	140	140	10	10	60	960	10	30	10	1050	20	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.2	8.2		7.5	7.5	7.5	7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	0.88	1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1570	1635		1770	1652	2787	1570	1793		3433	1451	
Flt Permitted	0.71	1.00		0.63	1.00	1.00	0.63	1.00		0.95	1.00	
Satd. Flow (perm)	1181	1635		1167	1652	2787	1048	1793		3433	1451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	152	11	11	65	1043	11	33	11	1141	22	174
RTOR Reduction (vph)	0	2	0	0	0	277	0	10	0	0	55	0
Lane Group Flow (vph)	152	161	0	11	65	766	11	34	0	1141	141	0
Heavy Vehicles (%)	15%	15%	15%	2%	15%	2%	15%	2%	2%	2%	2%	15%
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA		Prot	NA	
Protected Phases		8			4	1		2		1	6	
Permitted Phases	8			4		4	2					
Actuated Green, G (s)	19.3	19.3		20.0	20.0	80.8	6.7	6.7		60.8	75.0	
Effective Green, g (s)	19.3	19.3		20.0	20.0	80.8	6.7	6.7		60.8	75.0	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.73	0.06	0.06		0.55	0.68	
Clearance Time (s)	8.2	8.2		7.5	7.5	7.5	7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	286		212	300	2237	63	109		1897	989	
v/s Ratio Prot		0.10			0.04	0.19		c0.02		c0.33	0.10	
v/s Ratio Perm	c0.13			0.01		0.09	0.01					
v/c Ratio	0.73	0.56		0.05	0.22	0.34	0.17	0.31		0.60	0.14	
Uniform Delay, d1	42.9	41.5		37.2	38.3	5.2	49.0	49.4		16.5	6.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.69	0.01	
Incremental Delay, d2	12.6	2.5		0.1	0.4	0.1	1.3	1.6		1.3	0.1	
Delay (s)	55.6	44.0		37.3	38.7	5.3	50.4	51.0		12.6	0.1	
Level of Service	E	D		D	D	A	D	D		B	A	
Approach Delay (s)		49.6			7.5			50.9			10.8	
Approach LOS		D			A			D			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.2
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



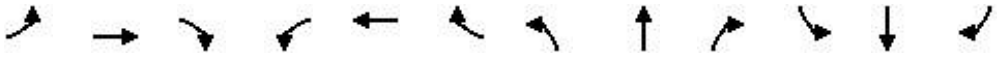
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	58	1489	217	22	2087	86	424	89	54	86	89	86
v/c Ratio	0.60	0.52	0.22	0.27	0.76	0.09	0.82	0.26	0.14	0.28	0.61	0.29
Control Delay	93.8	22.1	3.5	83.0	12.0	0.1	74.9	53.8	0.7	43.0	84.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.8	22.1	3.5	83.0	12.0	0.1	74.9	53.8	0.7	43.0	84.6	2.5
Queue Length 50th (ft)	56	360	6	23	213	0	208	74	0	62	85	0
Queue Length 95th (ft)	#114	406	49	m29	232	m0	267	128	0	109	148	0
Internal Link Dist (ft)		2582			1415			1968			217	
Turn Bay Length (ft)	330		235	250		200	275		200	100		120
Base Capacity (vph)	101	2852	984	83	2738	942	574	373	420	312	153	301
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.52	0.22	0.27	0.76	0.09	0.74	0.24	0.13	0.28	0.58	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1370	200	20	1920	79	390	82	50	79	82	79
Future Volume (vph)	53	1370	200	20	1920	79	390	82	50	79	82	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1687	5036	1583	1770	5085	1583	3433	1863	1583	1719	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1687	5036	1583	1770	5085	1583	3433	1863	1583	1265	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	1489	217	22	2087	86	424	89	54	86	89	86
RTOR Reduction (vph)	0	0	92	0	0	40	0	0	44	0	0	79
Lane Group Flow (vph)	58	1489	125	22	2087	46	424	89	10	86	89	7
Heavy Vehicles (%)	7%	3%	2%	2%	2%	2%	2%	2%	2%	5%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2	2		6
Actuated Green, G (s)	7.2	82.6	82.6	4.2	79.6	79.6	22.7	27.4	27.4	34.5	11.8	11.8
Effective Green, g (s)	7.2	82.6	82.6	4.2	79.6	79.6	22.7	27.4	27.4	34.5	11.8	11.8
Actuated g/C Ratio	0.05	0.55	0.55	0.03	0.53	0.53	0.15	0.18	0.18	0.23	0.08	0.08
Clearance Time (s)	6.0	6.9	6.9	6.0	6.9	6.9	7.9	7.9	7.9	7.9	7.9	7.9
Vehicle Extension (s)	3.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0	3.5	4.0	4.0
Lane Grp Cap (vph)	80	2773	871	49	2698	840	519	340	289	312	146	124
v/s Ratio Prot	c0.03	c0.30		0.01	c0.41		c0.12	0.05		0.01	c0.05	
v/s Ratio Perm			0.08			0.03			0.01	0.05		0.00
v/c Ratio	0.72	0.54	0.14	0.45	0.77	0.05	0.82	0.26	0.03	0.28	0.61	0.05
Uniform Delay, d1	70.4	21.5	16.4	71.8	28.0	17.0	61.6	52.6	50.4	46.8	66.9	63.9
Progression Factor	1.00	1.00	1.00	1.13	0.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6	0.8	0.3	5.4	1.4	0.1	9.6	0.6	0.1	0.6	8.1	0.3
Delay (s)	98.0	22.2	16.8	86.2	11.9	17.1	71.3	53.2	50.5	47.4	75.0	64.2
Level of Service	F	C	B	F	B	B	E	D	D	D	E	E
Approach Delay (s)		24.1			12.8			66.5			62.3	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.7
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	467	1098	43	326	1446	717	22	380	152	707	467	685
v/c Ratio	0.93	0.66	0.06	0.78	0.84	0.87	0.09	0.95	0.39	0.97	0.53	0.87
Control Delay	72.4	63.1	0.2	82.6	45.2	25.6	30.9	98.8	3.0	83.9	45.9	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.4	63.1	0.2	82.6	45.2	25.6	30.9	98.8	3.0	83.9	45.9	32.2
Queue Length 50th (ft)	237	408	0	224	293	187	14	197	0	357	264	307
Queue Length 95th (ft)	#342	462	m0	m286	421	#358	34	#301	0	#484	344	#573
Internal Link Dist (ft)		2846			3068			693			603	
Turn Bay Length (ft)	400		410	385		410	500		500	500		500
Base Capacity (vph)	503	1673	677	530	1731	825	248	401	386	732	886	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.66	0.06	0.62	0.84	0.87	0.09	0.95	0.39	0.97	0.53	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	1010	40	300	1330	660	20	350	140	650	430	630
Future Volume (vph)	430	1010	40	300	1330	660	20	350	140	650	430	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	0.97	0.91	1.00	*0.75	0.91	1.00	1.00	0.95	1.00	0.97	*0.75	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	2654	5085	1583	1770	3539	1583	3433	2794	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.30	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	2654	5085	1583	557	3539	1583	3433	2794	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	467	1098	43	326	1446	717	22	380	152	707	467	685
RTOR Reduction (vph)	0	0	30	0	0	294	0	0	132	0	0	283
Lane Group Flow (vph)	467	1098	13	326	1446	423	22	380	20	707	467	402
Turn Type	Prot	NA	Perm	Prot	NA	Perm	D.P+P	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4	6		2			6
Actuated Green, G (s)	21.9	46.6	46.6	23.6	48.3	48.3	51.8	19.8	19.8	32.0	47.6	47.6
Effective Green, g (s)	21.9	46.6	46.6	23.6	48.3	48.3	51.8	19.8	19.8	32.0	47.6	47.6
Actuated g/C Ratio	0.15	0.31	0.31	0.16	0.32	0.32	0.35	0.13	0.13	0.21	0.32	0.32
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	501	1579	491	417	1637	509	226	467	208	732	886	502
v/s Ratio Prot	c0.14	0.22		0.12	c0.28		0.00	0.11		c0.21	0.17	
v/s Ratio Perm			0.01			0.27	0.03		0.01			c0.25
v/c Ratio	0.93	0.70	0.03	0.78	0.88	0.83	0.10	0.81	0.10	0.97	0.53	0.80
Uniform Delay, d1	63.3	45.5	35.9	60.7	48.2	47.1	33.3	63.3	57.2	58.5	42.0	46.8
Progression Factor	0.75	1.39	1.00	1.22	0.91	0.96	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.7	2.3	0.1	6.1	4.9	9.9	0.2	10.4	0.2	24.9	0.6	8.9
Delay (s)	70.0	65.7	36.0	80.3	49.0	55.3	33.4	73.7	57.4	83.3	42.5	55.7
Level of Service	E	E	D	F	D	E	C	E	E	F	D	E
Approach Delay (s)		66.1			54.9			67.7			62.9	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	61.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

34: Rt ZZ/Rt M/MM Corridor & Rt M

12/09/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	285	33	391	587	250	43	391	261	120	565	11
v/c Ratio	0.06	0.81	0.06	0.91	0.79	0.16	0.26	0.61	0.36	0.40	0.90	0.02
Control Delay	20.4	64.1	0.2	53.7	40.1	0.2	22.6	36.7	4.8	24.1	56.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	64.1	0.2	53.7	40.1	0.2	22.6	36.7	4.8	24.1	56.9	0.0
Queue Length 50th (ft)	5	206	0	213	365	0	18	247	0	53	411	0
Queue Length 95th (ft)	17	#324	0	#365	#676	0	41	357	56	92	#650	0
Internal Link Dist (ft)		1544			1207			1360			1261	
Turn Bay Length (ft)	260		260	475		250	230		230	230		230
Base Capacity (vph)	187	401	552	430	747	1583	319	819	842	301	626	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.71	0.06	0.91	0.79	0.16	0.13	0.48	0.31	0.40	0.90	0.02

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	262	30	360	540	230	40	360	240	110	520	10
Future Volume (vph)	10	262	30	360	540	230	40	360	240	110	520	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	4.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1703	1863	1583	1770	1863	1583
Flt Permitted	0.16	1.00	1.00	0.36	1.00	1.00	0.10	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	304	1863	1583	666	1863	1583	183	1863	1583	605	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	285	33	391	587	250	43	391	261	120	565	11
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	175	0	0	7
Lane Group Flow (vph)	11	285	7	391	587	250	43	391	86	120	565	4
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Free	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8	8		Free	6		2	2		6
Actuated Green, G (s)	47.6	27.6	27.6	47.6	46.6	121.9	46.3	40.3	40.3	46.3	39.1	39.1
Effective Green, g (s)	47.6	27.6	27.6	47.6	46.6	121.9	46.3	40.3	40.3	46.3	39.1	39.1
Actuated g/C Ratio	0.39	0.23	0.23	0.39	0.38	1.00	0.38	0.33	0.33	0.38	0.32	0.32
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	130	421	358	441	712	1583	159	615	523	287	597	507
v/s Ratio Prot	0.00	0.15		c0.15	c0.32		0.02	0.21		c0.02	c0.30	
v/s Ratio Perm	0.03		0.00	0.20		c0.16	0.09		0.05	0.14		0.00
v/c Ratio	0.08	0.68	0.02	0.89	0.82	0.16	0.27	0.64	0.16	0.42	0.95	0.01
Uniform Delay, d1	26.4	43.1	36.6	30.3	34.0	0.0	28.2	34.6	28.9	26.3	40.4	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	4.3	0.0	18.8	7.7	0.2	0.9	2.2	0.1	1.0	24.1	0.0
Delay (s)	26.7	47.4	36.7	49.2	41.7	0.2	29.1	36.7	29.0	27.3	64.5	28.2
Level of Service	C	D	D	D	D	A	C	D	C	C	E	C
Approach Delay (s)		45.6			35.6			33.4			57.5	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	28.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues

34: Rt ZZ/Rt M/MM Corridor & Rt M

10/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	285	33	391	587	250	43	391	261	120	576
v/c Ratio	0.04	0.72	0.06	0.63	0.68	0.29	0.19	0.51	0.16	0.39	0.63
Control Delay	13.7	43.6	0.2	38.2	25.7	3.7	21.4	32.3	0.2	24.8	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	43.6	0.2	38.2	25.7	3.7	21.4	32.3	0.2	24.8	32.1
Queue Length 50th (ft)	3	147	0	104	241	0	15	99	0	44	153
Queue Length 95th (ft)	13	260	0	167	#544	50	40	156	0	90	228
Internal Link Dist (ft)		1544			1207			1360			1261
Turn Bay Length (ft)	260		260	475		250	230		230	230	
Base Capacity (vph)	284	525	642	837	923	911	228	1135	1583	304	1179
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.54	0.05	0.47	0.64	0.27	0.19	0.34	0.16	0.39	0.49

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

34: Rt ZZ/Rt M/MM Corridor & Rt M

10/07/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	262	30	360	540	230	40	360	240	110	520	10
Future Volume (vph)	10	262	30	360	540	230	40	360	240	110	520	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.0	7.0	7.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1703	3539	1583	1770	3529	
Flt Permitted	0.23	1.00	1.00	0.95	1.00	1.00	0.29	1.00	1.00	0.46	1.00	
Satd. Flow (perm)	421	1863	1583	3433	1863	1583	523	3539	1583	861	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	285	33	391	587	250	43	391	261	120	565	11
RTOR Reduction (vph)	0	0	24	0	0	146	0	0	0	0	2	0
Lane Group Flow (vph)	11	285	9	391	587	104	43	391	261	120	574	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%
Turn Type	D.P+P	NA	Perm	Prot	NA	Perm	D.P+P	NA	Free	D.P+P	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	4		8			4	6		Free	2		
Actuated Green, G (s)	38.6	23.7	23.7	14.9	37.8	37.8	23.9	19.4	90.5	23.9	21.3	
Effective Green, g (s)	38.6	23.7	23.7	14.9	37.8	37.8	23.9	19.4	90.5	23.9	21.3	
Actuated g/C Ratio	0.43	0.26	0.26	0.16	0.42	0.42	0.26	0.21	1.00	0.26	0.24	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	487	414	565	778	661	172	758	1583	272	830	
v/s Ratio Prot	0.00	0.15		c0.11	c0.32		0.01	0.11		c0.02	c0.16	
v/s Ratio Perm	0.02		0.01			0.07	0.06		c0.16	0.09		
v/c Ratio	0.06	0.59	0.02	0.69	0.75	0.16	0.25	0.52	0.16	0.44	0.69	
Uniform Delay, d1	16.9	29.1	24.8	35.6	22.4	16.4	25.4	31.4	0.0	26.5	31.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.8	0.0	3.7	4.2	0.1	0.8	0.6	0.2	1.1	2.5	
Delay (s)	17.0	30.9	24.8	39.3	26.6	16.5	26.2	32.0	0.2	27.6	34.1	
Level of Service	B	C	C	D	C	B	C	C	A	C	C	
Approach Delay (s)		29.8			28.6			19.7			33.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C

SAFETY ANALYSIS

2045 Crash Inputs

Version 2
USA_4SG_GE6
SiteUSA_4SG_GE6

Valid	Site No.	Highway	Site Description	Years of AADT Data	Class	Years of Crash Data	Year 1	Year 1 Major AADT	Year 1 Minor AADT	Year 2	Year 2 Major AADT	Year 2 Minor AADT	Year 3	Year 3 Major AADT	Year 3 Minor AADT	Observed Number of Crashes	Predicted Number of Crashes	Area Type	Intersection Category	Intersection Type	Presence of Lighting	Number of Approaches with Permissive Left-Turn Phasing	Number of Approaches with Permissive/Protected or Protected/Permissive Left-Turn Phasing	Number of Approaches with Protected Left-Turn Phasing	Number of Approaches on which Right Turn on Red is Prohibited	Presence of Red-Light Cameras	Number of Major Approaches with Right-Turn Channelization	Number of Approaches Prohibiting U-Turns	Number of Thru Lanes on Major Approaches	Number of Major Approaches with Left-Turn Lanes	Number of Thru Lanes on Minor Approaches	Pedestrian Volumes Crossing all Intersection Legs	Max. Number of Lanes Crossed by Pedestrians	Number of Bus Stops within 1000 ft of Intersection	Number of Schools within 1000 ft of Intersection	Number of Alcohol Sales Establishments within 1000 ft of Intersection	Replaced with Roundabout
valid	siteNo	highway	description	numYearsAADT	class	numYears	year1	year1MajorAADT	year1MinorAADT	year2	year2MajorAADT	year2MinorAADT	year3	year3MajorAADT	year3MinorAADT	numObservedCrashes	numPredictedCrashes	areaType	mUSAIntersectionCategory	mUSAIntersectionType	lighting	numAppPermissiveLT	numAppPermProLT	numAppProtectedLT	numAppNoRTOR	redLightCameras	numMajAwRTChannelization	numUTProhibited	numMajorThruLanes	numMajorWithLeftTurnLanes	numMinorThruLanes	pedVolume	pedMaxLanes	numBusStops	numSchools	numAlcoholEst	roundaboutRep
TRUE	1	Route 60 MM & 6-lane E/W, 5-lane N/S	60	1	Intersection											0		urban	2x2ge6	4SG		1	0	1	3	0	0	4	0	6	2	4	50	8	0	0	0	FALSE

IntersectionSiteSetAADT

Site No.	Year	AADT Major adtRateMajor	AADT Minor adtRateMinor
siteNo	adtYear		
1	2045	40,830	30,620

Version 2
Roundabout_USA_42R
SiteRoundabout_USA_42R

Valid	Site No.	Highway	Site Description	Years of AADT Data	Class	Years of Crash Data	Year 1	Year 1 Leg 1 AADT	Year 1 Leg 2 AADT	Year 1 Leg 3 AADT	Year 1 Leg 4 AADT	Year 2	Year 2 Leg 1 AADT	Year 2 Leg 2 AADT	Year 2 Leg 3 AADT	Year 2 Leg 4 AADT	Year 3	Year 3 Leg 1 AADT	Year 3 Leg 2 AADT	Year 3 Leg 3 AADT	Year 3 Leg 4 AADT	Observed Number of Crashes	Predicted Number of Crashes	Inscribed Diameter of the Circle	Number of Outbound Only Legs	Leg 1 Number of Circulating Lanes	Leg 1 Right Turn Bypass Lane	Leg 1 Entry Width of Leg	Leg 1 Number of Entering Lanes	Leg 1 Number of Driveways	Leg 1 Speed Limit	Leg 2 Number of Circulating Lanes	Leg 2 Right Turn Bypass Lane	Leg 2 Entry Width of Leg	Leg 2 Number of Entering Lanes	Leg 2 Number of Driveways	Leg 2 Speed Limit	Leg 3 Number of Circulating Lanes	Leg 3 Right Turn Bypass Lane	Leg 3 Entry Width of Leg	Leg 3 Number of Entering Lanes	Leg 3 Number of Driveways	Leg 3 Speed Limit	Leg 4 Number of Circulating Lanes	Leg 4 Right Turn Bypass Lane	Leg 4 Entry Width of Leg	Leg 4 Number of Entering Lanes	Leg 4 Number of Driveways	Leg 4 Speed Limit	Area Type	Roundabout Type
valid	siteNo	highway	description	numYearsAADT	class	numYears	year1	year1Leg1AADT	year1Leg2AADT	year1Leg3AADT	year1Leg4AADT	year2	year2Leg1AADT	year2Leg2AADT	year2Leg3AADT	year2Leg4AADT	year3	year3Leg1AADT	year3Leg2AADT	year3Leg3AADT	year3Leg4AADT	numObservedCrashes	numPredictedCrashes	circleDiameter	numOutboundOnlyLeg	leg1NumCirculatingLanes	leg1RightTurnBypassLane	leg1EntryWidthFeet	leg1NumEnteringLanes	leg1NumDriveways	leg1SpeedLimit	leg2NumCirculatingLanes	leg2RightTurnBypassLane	leg2EntryWidthFeet	leg2NumEnteringLanes	leg2NumDriveways	leg2SpeedLimit	leg3NumCirculatingLanes	leg3RightTurnBypassLane	leg3EntryWidthFeet	leg3NumEnteringLanes	leg3NumDriveways	leg3SpeedLimit	leg4NumCirculatingLanes	leg4RightTurnBypassLane	leg4EntryWidthFeet	leg4NumEnteringLanes	leg4NumDriveways	leg4SpeedLimit	areaType	roundaboutType
TRUE	1	Rt MM & FR 160	Dual SBR, Free WBR Bypass	1	Roundabout																0		220	0	1	FALSE	37	2	0	45	1	TRUE	21	1	0	45	2	FALSE	21	1	0	45	2	FALSE	21	1	0	45	urban	42R
TRUE	2	Rt MM & FR 160	Alt Config - Dual SBR, Yielding WBR Hybrid	1	Roundabout																0		220	0	1	FALSE	37	2	0	45	1	FALSE	37	2	0	45	2	FALSE	21	1	0	45	2	FALSE	21	1	0	45	urban	42R
TRUE	3	Rt MM & Rt ZZ/M	without WBR Slip	1	Roundabout																0		220	0	2	FALSE	37	2	0	45	1	FALSE	21	2	0	45	1	TRUE	21	1	0	45	2	FALSE	21	2	0	45	urban	42R
TRUE	4	Rt MM & Rt ZZ/M	Alt Config - Hybrid with WBR Slip	1	Roundabout																0		220	0	2	FALSE	37	2	0	45	1	TRUE	37	2	0	45	1	TRUE	21	1	0	45	2	FALSE	21	1	0	45	urban	42R

Roundabout4LegSiteSetAADT

Site No.	Year	Leg 1 AADT	Leg 1 adtRateLeg1	Percent Leg 1 AADT Entering Roundabout percentADTEnteringLeg1	Leg 2 AADT	Leg 2 adtRateLeg2	Percent Leg 2 AADT Entering Roundabout percentADTEnteringLeg2	Leg 3 AADT	Leg 3 adtRateLeg3	Percent Leg 3 AADT Entering Roundabout percentADTEnteringLeg3	Leg 4 AADT	Leg 4 adtRateLeg4	Percent Leg 4 AADT Entering Roundabout percentADTEnteringLeg4
siteNo	adtYear												
1	2045	24,110	43	22,720	57	630	63	4,490	52				
2	2045	24,110	43	22,720	57	630	63	4,490	52				
3	2045	12,250	48	16,340	57	15,840	51	7,780	37				
4	2045	12,250	48	16,340	57	15,840	51	7,780	37				

2045 Crash Prediction

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

October 14, 2021

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Report Overview

Report Generated: Oct 14, 2021 4:52 PM
Report Template: System: Single Page, 508 Compliant [System] (sscpm5, Sep 22, 2021 11:47 AM)

Evaluation Date: Thu Oct 14 15:51:05 CDT 2021
IHSDM Version: v16.0.0 (Sep 30, 2020)
Site Set Crash Prediction Module: v|ModuleInfo.moduleVersion| (|ModuleInfo.moduleDate|)

User Name: jaberry
Organization Name:
Phone:
E-Mail:

Project Title: Route MM/ZZ Corridor Study 021-5767
Project Comment: Created Wed Sep 08 10:35:44 CDT 2021
Project Unit System: U.S. Customary

Site Set: Rt MM @ FR 160, Rt MM & Rt 60, Rt MM/ZZ & Rt M
Site Set Comment: Created Wed Sep 08 10:41:21 CDT 2021
Site Set Version: v8

Evaluation Title: MM/ZZ Future Year 2045 Crashes
Evaluation Comment: Created Thu Oct 14 15:47:17 CDT 2021
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: HSM Configuration
Crash Distribution: HSM Configuration
Model/CMF: HSM Configuration
First Year of Analysis: 2045
Last Year of Analysis: 2045
Empirical-Bayes Analysis: None

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

Since the publication of the Highway Safety Manual - First Edition (HSM-1), in 2010 by the American Association of State Highway and Transportation Officials (AASHTO), multiple research efforts have been undertaken through the National Cooperative Highway Research Program (NCHRP) to develop safety performance models for road segment and intersection facility types that were not initially reflected in the HSM-1, in order to expand the breadth and depth of the HSM in the future.

The IHSDM Crash Prediction Module (CPM) is intended as a faithful implementation of HSM Part C predictive methods. As NCHRP projects to develop new predictive methods for the HSM are completed, FHWA works to incorporate the new methods into IHSDM, sometimes in advance of publication in the HSM. The following new crash predictive methods have been accepted by NCHRP project panels and incorporated into IHSDM, while pending AASHTO's approval for incorporation into a future edition of the HSM:

- Roundabouts: completed in 2018 under NCHRP Project 17-70, the new methods will provide improved outcomes for the safety analysis of roundabouts.
- 6+ lane and one-way urban/suburban arterials (including models for segments and intersections): completed under NCHRP Project 17-58.

However, in the absence of local calibration factors (see HSM-1 Part C, Appendix A for guidance on calibration of the predictive models), it is neither appropriate nor advisable to directly compare the results from new models (from NCHRP Projects 17-58 and 17-70) to results from HSM-1 models, as the models were not calibrated to the same base state data sets, and consequently can produce unexpected results. If local calibration factors are available and applied to both new models and HSM-1 models, then it may be appropriate to directly compare the results.*[Note: Work being performed under NCHRP Project 17-72 (Update of Crash Modification Factors for the Highway Safety Manual) is expected to re-calibrate many of the old (HSM-1) and new (e.g., NCHRP 17-70) models to data from a single (or small number of) states, that would allow results from all models to be directly compared.]*

The models produced for NCHRP Project 17-70 have independent value in terms of informing the design of a roundabout and assessing the effects of different design characteristics on the expected safety performance of a roundabout.

The HSM-1 interim method previously included in IHSDM for evaluating roundabouts on urban/suburban arterials (i.e., evaluating an existing intersection and then applying a Crash Modification Factor for replacing the existing intersection with a roundabout) has been deactivated in IHSDM, to minimize any confusion with the new roundabout methodology.

Section Types

Urban Arterial Site Set CPM Evaluation

Site Type

Type: 4SG_GE6
Calibration Factor: 1

Table 1. Evaluation and Crash Data (CSD) (if applicable) Intersection Sites

Site No.	Type	Highway	Site Description	Major AADT	Minor AADT	Presence of Lighting	Number of Approaches with Permissive Left-Turn Phasing	Number of Approaches with Permissive/Protected or Protected/Permissive Left-Turn Phasing	Number of Approaches with Protected Left-Turn Phasing	Number of Approaches on which Right Turn on Red is Prohibited	Presence of Red-Light Cameras	Pedestrian Volumes Crossing all Intersection Legs (crossings/day)	Max. Number of Lanes Crossed by Pedestrians	Number of Bus Stops within 1000 ft of Intersection	Number of Schools within 1000 ft of Intersection	Number of Alcohol Sales Establishments within 1000 ft of Intersection
1	4SG2x2ge6	Route MM & Route 60	6-lane E/W, 5-lane N/S	2045: 40830	2045: 30620	yes	0	1	3	0	no	50	8	0	0	0

Table 2. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Highway	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	4SG	Route MM & Route 60	6-lane E/W, 5-lane N/S	23.509	23.5093	12.5466	10.9628	0.90	23.5093
		Total	Total	23.509	23.5093	12.5466	10.9628	0.90	23.5093

Table 3. Predicted Crash Frequencies by Year (4SG_GE6)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2045	23.51	12.55	53.368	10.96	46.632
Total	23.51	12.55	53.368	10.96	46.632
Average	23.51	12.55	53.368	10.96	46.632

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 4. Predicted USA 4SG_GE6 Sites Crash Severity

Site No.	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)
1	0.0634	0.6109	3.0616	8.8106	10.9628
Total	0.0634	0.6109	3.0616	8.8106	10.9628

Table 5. Predicted 4SG_GE6 Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Angle Collision	9.00	38.3	6.05	25.7	15.05	64.0
Intersection	Collision with Bicycle	0.44	1.9	0.00	0.0	0.44	1.9
Intersection	Head-on Collision	1.12	4.8	0.50	2.1	1.63	6.9
Intersection	Other Multi-vehicle Collision	0.35	1.5	0.24	1.0	0.59	2.5
Intersection	Other Single-vehicle Collision	0.14	0.6	0.67	2.8	0.81	3.5
Intersection	Collision with Pedestrian	0.05	0.2	0.00	0.0	0.05	0.2
Intersection	Rear-end Collision	1.00	4.3	1.62	6.9	2.62	11.2
Intersection	Sideswipe	0.46	1.9	1.88	8.0	2.33	9.9
Intersection	Total Intersection Total Vehicle Crashes	12.56	53.4	10.96	46.6	23.52	100.0
Intersection	Total Intersection Crashes	12.56	53.4	10.96	46.6	23.52	100.0
	Total Crashes	12.56	53.4	10.96	46.6	23.52	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Roundabout Site Set CPM Evaluation

Site Type

Type: Roundabout USA 42R
Calibration Factor: USA 42R = 1.0

Table 6. Evaluation and Crash Data (CSD) (if applicable) Roundabout - Homogeneous Sites

Site No.	Type	Roundabout	Site Description	Area Type	Entering AADT
1	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & FR 160	Dual SBR, Free WBR Bypass	Urban	Leg 1:2045: 10367; Leg 2:2045: 12950; Leg 3:2045: 396; Leg 4:2045: 2334
2	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & FR 160	Alt Config - Dual SBR, Yielding WBR	Urban	Leg 1:2045: 10367; Leg 2:2045: 12950; Leg 3:2045: 396; Leg 4:2045: 2334
3	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & Rt ZZ/M	Hybrid without WBR Slip	Urban	Leg 1:2045: 5880; Leg 2:2045: 9313; Leg 3:2045: 8078; Leg 4:2045: 2878
4	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & Rt ZZ/M	Alt Config - Hybrid with WBR Slip	Urban	Leg 1:2045: 5880; Leg 2:2045: 9313; Leg 3:2045: 8078; Leg 4:2045: 2878

Table 7. Predicted Crash Frequencies and Rates by Site

Site No.	Type	Roundabout	Site Description	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Intersection Travel Crash Rate (crashes/million veh)	Intersection Crash Rate (crashes/yr)
1	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & FR 160	Dual SBR, Free WBR Bypass	9.709	9.7089	1.2225	8.4864	2.04	9.7089
2	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & FR 160	Alt Config - Dual SBR, Yielding WBR	10.326	10.3264	1.8400	8.4864	2.17	10.3264
3	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & Rt ZZ/M	Hybrid without WBR Slip	9.916	9.9160	1.4573	8.4587	2.08	9.9160
4	42R - Roundabout with 4 legs and two circulating lanes	Rt MM & Rt ZZ/M	Alt Config - Hybrid with WBR Slip	8.926	8.9261	0.9276	7.9984	1.87	8.9261
		Total	Total	38.877	38.8774	5.4474	33.4300	2.04	38.8774

Table 8. Predicted Crash Frequencies by Year (Roundabout USA 42R)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2045	38.88	5.45	14.012	33.43	85.988
Total	38.88	5.45	14.012	33.43	85.988
Average	38.88	5.45	14.012	33.43	85.988

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 9. Predicted Roundabout USA 42R Crash Severity

Site No.	Fatal (K) Crashes (crashes)	Incapacitating Injury (A) Crashes (crashes)	Non-Incapacitating Injury (B) Crashes (crashes)	Possible Injury (C) Crashes (crashes)	No Injury (O) Crashes (crashes)
1	0.0104	0.1031	0.4095	0.6996	8.4864
2	0.0156	0.1552	0.6163	1.0529	8.4864
3	0.0124	0.1229	0.4881	0.8339	8.4587
4	0.0079	0.0782	0.3107	0.5308	7.9984
Total	0.0462	0.4594	1.8246	3.1172	33.4300

Table 10. Predicted Roundabout USA 42R Crash Type Distribution

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Intersection	Collision with Animal	0.00	0.0	0.10	0.3	0.10	0.3
Intersection	Collision with Fixed Object	0.69	1.8	4.61	11.9	5.30	13.6
Intersection	Collision with Other Object	0.00	0.0	0.07	0.2	0.07	0.2
Intersection	Other Single-vehicle Collision	0.69	1.8	1.24	3.2	1.92	4.9
Intersection	Collision with Parked Vehicle	0.00	0.0	0.00	0.0	0.00	0.0
Intersection	Total Single Vehicle Crashes	1.38	3.5	6.02	15.5	7.40	19.0
Intersection	Angle Collision	0.77	2.0	5.82	14.9	6.59	16.9
Intersection	Head-on Collision	0.04	0.1	0.17	0.4	0.21	0.5
Intersection	Other Multiple-vehicle Collision	0.83	2.1	6.65	17.1	7.48	19.2
Intersection	Rear-end Collision	1.46	3.8	5.95	15.3	7.41	19.0
Intersection	Sideswipe	0.96	2.5	8.86	22.8	9.82	25.2
Intersection	Total Multiple Vehicle Crashes	4.07	10.5	27.45	70.5	31.52	81.0
Intersection	Total Intersection Crashes	5.45	14.0	33.46	86.0	38.91	100.0
	Total Crashes	5.45	14.0	33.46	86.0	38.91	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

ROUTE MM/ZZ CORRIDOR STUDY

JAMES RIVER FREEWAY TO ROUTE M

Missouri Department of Transportation

December 2021

MoDOT Project No. J8S3159

Olsson Project No. 021-05767