DIXON AREA ADVANCED TRAFFIC AND RAILROAD SAFETY STUDY

ADOPTED OCTOBER 19, 2021

PREPARED FOR:

CITY OF DIXON

DKS

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TABLE OF CONTENTS

APPENDIX CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

This study recommends a comprehensive railroad crossing improvement plan in and around Dixon to enhance safety while preserving convenience and accessibility for all travelers. This study also assesses how growth will affect traffic on City roadways and intersections adjacent to the railroad crossings as well as the traffic impact of potential grade separations or crossing closures.

Appropriate safety improvements at the seven at-grade railroad crossing locations and impacts on adjacent roadways and intersection were determined by reviewing crash data, analyzing traffic impacts/benefits of railroad crossing improvements and recommendations for safety improvements consistent with the Dixon General Plan 2040 transportation goals and UPRR policies.

SAFETY REVIEW (CHAPTER 2)

Table 1 (page 4) summarizes the crash data compiled for the study area. In general, there were a few common trends among the at-grade crossing locations when reviewing the safety data:

- Observed collisions at rail crossings are exceedingly rare, having occurred twice in the past 10 years. However, both collisions resulted in a fatality (once when a person intentionally walked in front of an oncoming train and another when a vehicle was stuck on the train tracks).
- There is limited overhead street lighting at many of the railroad crossing locations and many of the crossings do not meet current standards for signing and striping.
- There is minimal support for people walking and biking across the at-grade railroad crossings.
- At most locations, single gate arms and lack of medians make it possible for cars to cross tracks in advance of an approaching train.

More information on collision data analysis and the safety review can be found in Chapter 2 and Appendix Section B.

TRAFFIC IMPACTS OF RAIL CROSSING PROJECTS (CHAPTER 3)

Various projects around the rail crossings have been proposed that affect roadway connectivity. These projects include the Parkway Boulevard grade separation, Vaughn Road realignment, A Street Underpass and closure of the Pitt School Road at grade crossing. The traffic implications for various combinations of these projects were analyzed using the City's travel demand model and future (year 2040) land use projections. DKS worked with the City to establish three alternative future scenarios to be evaluated: Baseline Scenario (includes most planned projects; largely consistent with network assumed for the General Plan), Scenario A (removes the Vaughn Road realignment and Parkway Boulevard grade separation from the Baseline Scenario) and Scenario B (adds the A Street underpass and Pitt School Road crossing closure to Baseline Scenario).

The traffic analysis indicated limited changes relative to the Baseline project scenario under both Alternatives A and B. At the study intersections where a capacity issue was identified or a project modified the intersection control (such as the realignment of Vaughn Road), multiple intersection control alternatives were tested to determine the appropriate recommended solution. The following section summarizes the recommended intersection improvements along with the railroad crossing safety improvements. More information on the traffic analysis can be found in Chapter 3 and Appendix Section C.

RECOMMENDED IMPROVEMENTS & FUNDING SOURCES (CHAPTER 4)

Based on the safety and traffic analysis, a set of recommendations were made at each of the rail crossing locations. Recommendations are made for improving the existing at-grade crossings and a grade separation or crossing closure improvement for railroad crossings in the northeast, central and southwest areas of Dixon.

In general, the at-grade crossing improvements are lower in cost and can be implemented over the short term while grade separation is more costly and may take many years to implement. The recommended improvements were discussed at a diagnostic field visit in coordination with representatives from Union Pacific Railroad, the California Public Utilities Commission, the City of Dixon, Solano County, Caltrans, the Dixon Unified School District and consultant project staff.

The revised lists of recommendations are based on best practices for safety for at-grade crossing intersections. **Table 2** (page 29 and repeated below as Table ES-1) summarizes the recommend railroad crossing improvements near each of the five at-grade railroad crossing locations in Dixon. Priority projects with associated planning level cost estimates include:

- Pitt School Road at-grade railroad crossing closure – $27,000
- Parkway Boulevard grade separation – $25,000,000
- Vaughn Road realignment and Vaughn Road at-grade railroad crossing closure – $5,500,000
- Pedrick Road at-grade railroad crossing improvements - $960,000
- At-grade railroad crossing improvements on A Street and other central area capacity and safety improvements – $1,450,000

The recommended improvements are described in more detail in Chapter 4 and Appendix Section D. These improvements are schematically illustrated in **Figures 7-12** (pages 16-25 and repeated starting on page ES-4).

PROJECT FUNDING

The recommended projects from this study will be incorporated into the City’s Traffic Impact Fee to provide more project funding opportunities. Additionally, the Railway-Highway At-grade Crossings program (Section 130) provides funding to help eliminate hazards at-grade crossings. Funding from the Section 130 program could help fund the recommended improvements at the Vaughn Road railroad crossing and the Pitt School Road railroad crossing. Another potential source of funding for grade separation of railroad crossings is the Caltrans Railroad-Highway Grade Crossing Program (RHGCP – Section 190), which provides funding for grade separation of railroad crossings. Based on the criteria for the Section 190 program, the Parkway Boulevard grade separation has the greatest likelihood of funding, followed by the A Street underpass and the Pedrick Road grade separation.

TABLE ES-1: SUMMARY OF RECOMMENDED RAILROAD CROSSING IMPROVEMENTS

RAILROAD CROSSING	JURIS-DICTION	TYPE OF IMPROVEMENT	RECOMMENDED IMPROVEMENT	PLANNING LEVEL COST ESTIMATE
PEDRICK ROAD	City/ County	At-Grade	At-grade crossing improvements including striping, signing and enhanced pedestrian and bicycle facilities	$960K
		Grade Separation/ Crossing Closure	Grade separation of Pedrick Road is recommended as a long-term solution	$30M
VAUGHN ROAD	City/ County	At-Grade	None	-
		Grade Separation/ Crossing Closure	Vaughn Road realignment and at-grade crossing closure	$5.5M
FIRST STREET	City	At-Grade	Enhanced overhead street lighting near the railroad crossing and enhanced pedestrian crossings on First Street	$213K[a]
		Grade Separation/ Crossing Closure	None	-
A STREET	City	At-Grade	At-grade crossing improvements including enhanced pedestrian and bicycle facilities, automatic pedestrian gate arms, enhanced overhead street lighting, wayfinding signage	$1.45M
		Grade Separation/ Crossing Closure	A Street underpass has been studied previously and is preferred by the City as a long-term solution. Note that UPRR no longer allows railroad underpasses as a matter of policy and instead strongly favors overpasses	$35M
PITT SCHOOL ROAD	County	At-Grade	The County is currently pursuing at-grade crossing improvements at this location including adding a median on Pitt School Road, realigning the gate arm and restriping the intersection. Additional improvements include upgrading signing and striping to MUTCD standard.	$27K
		Grade Separation/ Crossing Closure	Closure of the at-grade crossing, construction of Parkway Boulevard grade separation	$25M

a) Cost estimate also includes minor improvements at Jackson/A Street intersection

FIGURE ES-1. PEDRICK ROAD AT-GRADE RAIL CROSSING SAFETY IMPROVEMENTS

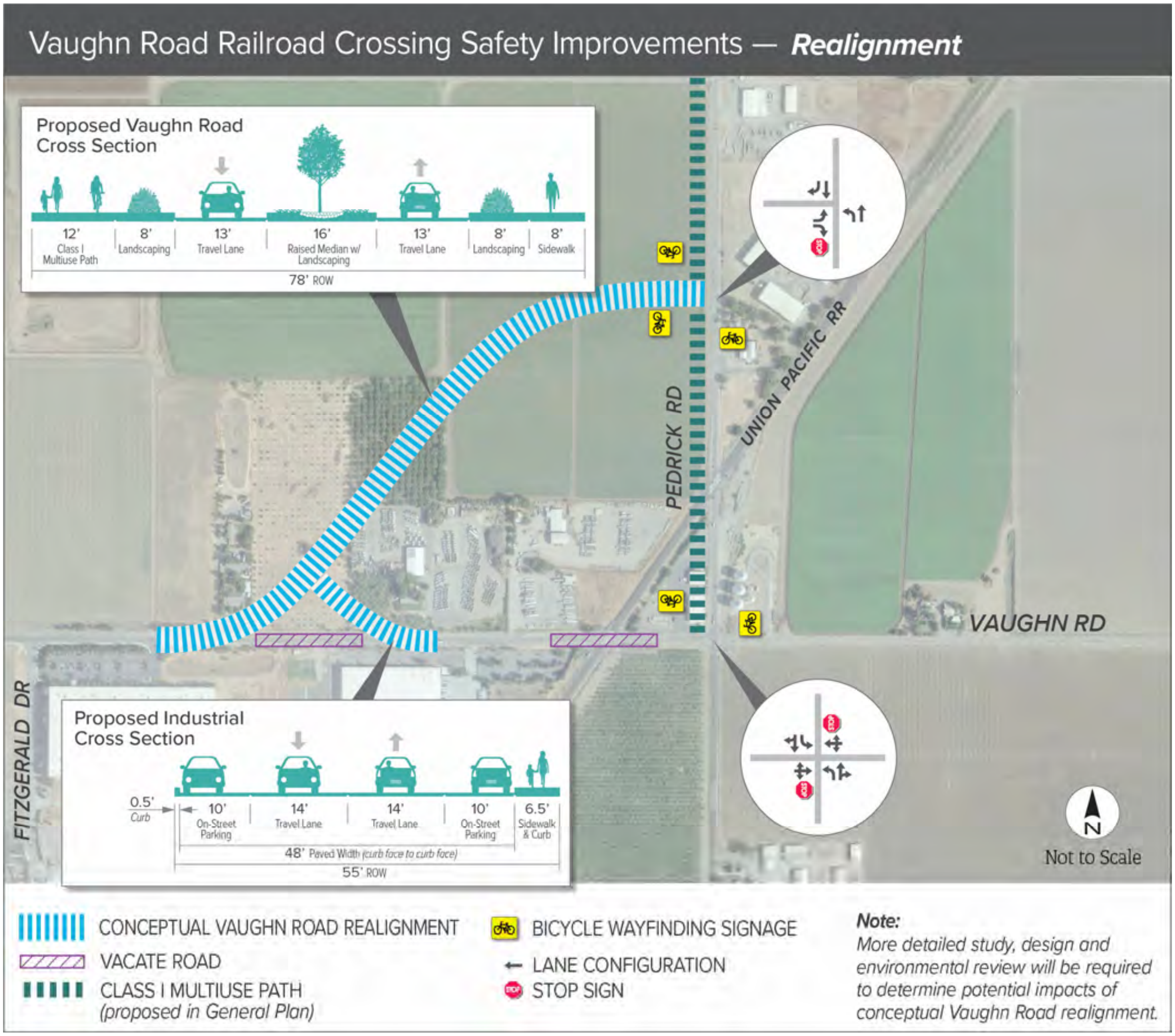

FIGURE ES-2. VAUGHN ROAD REALIGNMENT AND AT-GRADE RAILROAD CROSSING CLOSURE

FIGURE ES-3. A STREET RAILROAD CROSSING SAFETY IMPROVEMENTS

FIGURE ES-4. OPTIONAL MITIGATION FOR FIRST STREET QUEUEING

FIGURE ES-5. FIRST STREET ENHANCED PEDESTRIAN CROSSING OPPORTUNITIES

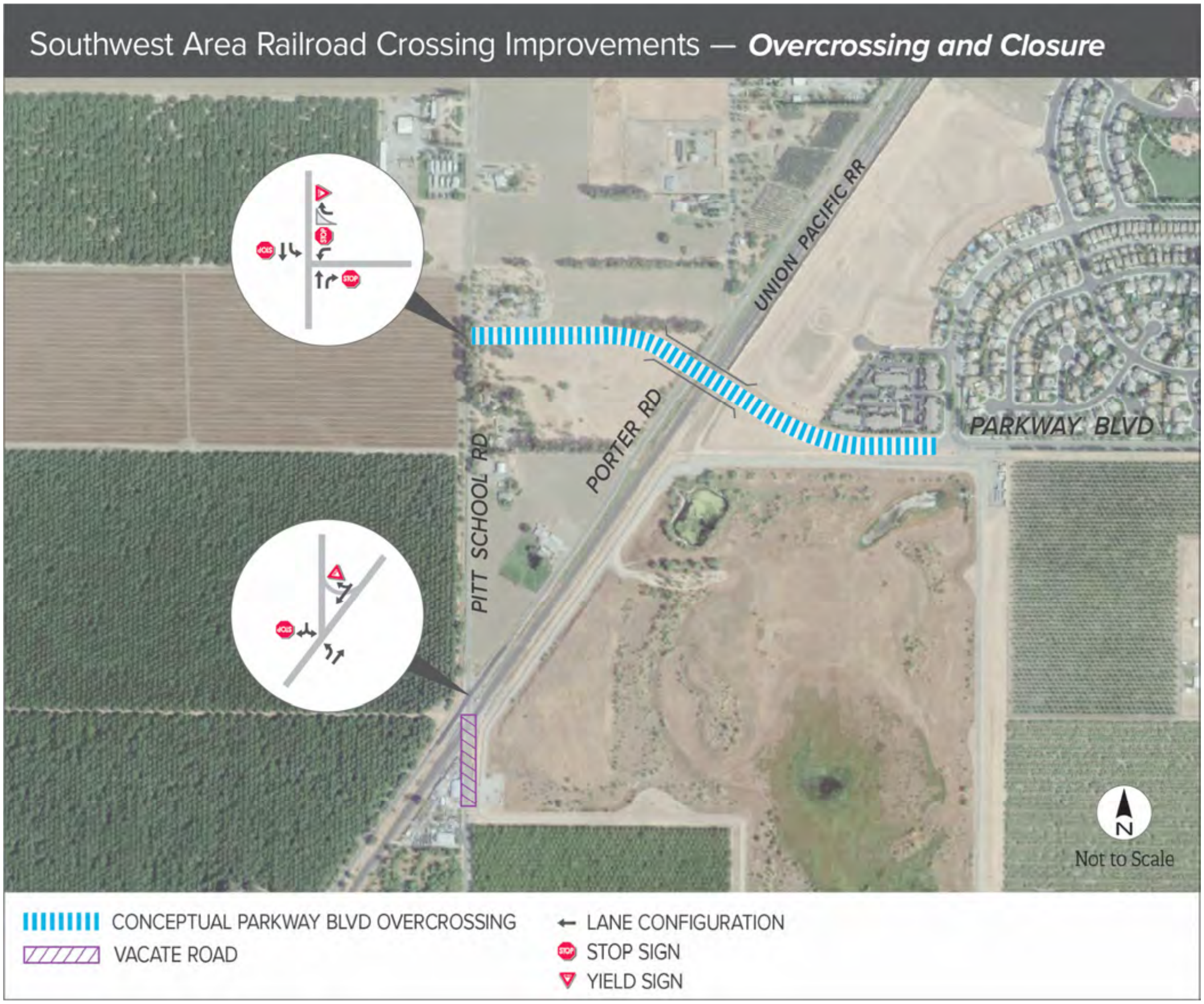

FIGURE ES-6. SOUTHWEST AREA RAILROAD CROSSING IMPROVEMENTS – OVERPASS AND CLOSURE

CHAPTER 1. STUDY PURPOSE AND INTRODUCTION

Dixon, California is a small agricultural city in northern Solano County with a population of approximately 20,000 people. Dixon is situated between Davis and Vacaville along Interstate-80. State Route-113 runs through the center of town connecting with State Route-12 between Rio Vista and Fairfield.

Additionally, there is a regional Union Pacific Railroad (UPRR) line running through the city. The rail line serves approximately 40 trains per day, including both freight and passenger service. There are five at-grade crossings in or near Dixon, as shown in **Figure 1** (page 2). Two crossings are located in downtown Dixon (central area) while three other crossing locations are located near the boundary between the City and Solano County. All the crossings are controlled by automatic gate arms.

Recent fatal crashes at the at-grade railroad crossings in Dixon have raised concerns about safety long-term, particularly as motor vehicle traffic in Dixon continues to grow over the next 20 years. In particular, the Northeast Quadrant Plan and the Southwest Area Specific Plan identify significant residential and commercial land use growth, with more vehicles traveling through the existing at-grade railroad crossings.

The purpose of this study is to recommend a comprehensive railroad crossing improvement plan in and around Dixon to enhance safety while preserving convenience and accessibility for all travelers. This study also assesses how growth will affect traffic on City roadways and intersections adjacent to the railroad crossings as well as the traffic impact of potential grade separations or crossing closures.

To help determine appropriate safety improvements at the railroad crossings and identify the impact on adjacent roadways and intersection, this study documents:

- A review of crash data to identify safety hotspots
- An analysis of the traffic impacts or benefits of railroad crossing improvements
- Recommendations for safety improvements consistent with the Dixon General Plan 2040 transportation goals and UPRR policies

The recommended projects from this study will be incorporated into the City's Traffic Impact Fee to provide additional project funding opportunities.

FIGURE 1. DIXON RAILROAD CROSSINGS AND STUDY INTERSECTIONS

CHAPTER 2. EXISTING TRAFFIC OPERATIONS AND SAFETY REVIEW

To understand how the existing at-grade rail crossings operate, a safety and traffic operations analysis was conducted. The material summarized in this section is reported in greater detail in Appendices A and B.

The previous ten years of railroad crossing crash records were reviewed to identify any potential hotspot locations. The past five years of intersection crashes were reviewed to determine any potential correlation with the at-grade railroad crossings. Traffic operations at intersections were analyzed to determine if at-grade railroad crossing safety is impacted by queues or stopped vehicles during a train crossing event. The traffic operations analysis was based on traffic counts collected between April 2019 and March 2021[1]. Operations were compared against the City's delay standard.

Table 1 (page 4) summarizes the crash data compiled for the study area. In general, there were a few common trends among the at-grade crossing locations when reviewing the safety data:

- Observed collisions at rail crossings are exceedingly rare, having occurred twice in the past 10 years. However, both collisions resulted in a fatality (once when a person intentionally walked in front of an oncoming train and another when a vehicle was stuck on the train tracks).
- There is limited overhead street lighting at many of the railroad crossing locations and many of the crossings do not meet current standards[2] for signing and striping.
- There is minimal support for people walking and biking across the at-grade railroad crossings.
- At most locations, single gate arms and lack of medians make it possible for cars to cross tracks in advance of an approaching train.

The following sections summarize the specific findings for each of the three key areas from the safety review and existing traffic operations analysis.

NORTHEAST AREA FINDINGS

There are two at-grade railroad crossings in the Northeast Area, on Pedrick Road and Vaughn Road, as shown in **Figure 2** (page 5). Both crossings are located on the edge of the Dixon city limits.

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[1] 2020 and 2021 counts were adjusted to account for travel pattern change associated with the COVID-19 pandemic as discussed in the *Data Collection and Methodology Memorandum.*

[2] California Manual on Uniform Traffic Control Devices (MUTCD) 2014 Edition Revision 5 March 27, 2020. Federal Highway Administration.

NORTHEAST AREA SAFETY SUMMARY

There were no recorded collisions at the railroad crossing over the past 10 years. Vaughn Road is part of the Solano County Dixon-Davis Bikeway and crosses the railroad at a high skew angle, creating a potential hazard for people biking.

TABLE 1: CRASH SUMMARY

ID	LOCATION	TYPE	TOTAL CRASHES	PROPERTY DAMAGE ONLY	VISIBLE OR POSSIBLE INJURY	SERIOUS INJURY OR FATALITY
1A	PEDRICK RD CROSSING	Railroad Crossing	0	0	0	0
1B	VAUGHN RD CROSSING	Railroad Crossing	0	0	0	0
1C	PEDRICK RD & VAUGHN RD	Intersection	1	1	0	0
2A	FIRST ST CROSSING	Railroad Crossing	1	0	0	1
2B	FIRST ST & C ST	Intersection	5	4	1	0
2C/ 2D	N ADAMS/PORTER ST & A ST	Intersection	6	4	2	0
2E	A ST CROSSING	Railroad Crossing	0	0	0	0
2F	JACKSON ST & A ST	Intersection	8	7	1	0
2G	FIRST ST & A ST	Intersection	11	9	2	0
3A	PITT SCHOOL RD CROSSING	Railroad Crossing	1	0	0	1
3B	PITT SCHOOL RD AND PORTER ST	Intersection	0	0	0	0

Source: SWITRS, 2020, https://www.chp.ca.gov/programs-services/services-information/switrs-internet-statewide-integrated-traffic-records-system

Federal Rail Administration Crossing Inventory & Accident Reports, 2020

NORTHEAST AREA TRAFFIC OPERATIONS SUMMARY

The crossings are located within 415 feet and 650 feet of the intersection of Pedrick Road and Vaughn Road. The intersection operates as an all-way stop-controlled intersection, with minimal delays today. Speeds are high (55 miles per hour) on Pedrick Road, which contributed to the one documented crash in the past five years at the Pedrick Road/Vaughn Road intersection.

FIGURE 2. NORTHEAST AREA RAILROAD CROSSINGS

CENTRAL AREA FINDINGS

There are two at-grade railroad crossings in the Central Area, on First Street (SR 113) and A Street, as shown in Figure 3 (page 7). When school is in session, the railroad crossing at First Street is used by school buses 16 times per day, and the railroad crossing at A Street is used by school buses 22 times per day.

CENTRAL AREA SAFETY SUMMARY

There was one recorded collision at the First Street railroad crossing over the past 10 years, where a person intentionally walked in front of an oncoming train. Limited sight distance was identified on the southeast corner of the crossing due to vegetation. On A Street, there is a steep approach to the tracks due to multiple repavings. There are limited sidewalks at the A Street railroad crossing.

CENTRAL AREA TRAFFIC OPERATIONS SUMMARY

Both crossings are located within 1,000 feet of several downtown intersections. The intersections of A Street/Porter Road and 1st Street/A Street are both controlled by traffic signals, but the remaining study intersections are two-way stop-controlled intersections. All of the study intersections currently meet the City's peak hour mobility standard of level-of-service (LOS) D[3]. However, the side street approaches at First Street/C Street and Jackson Street/A Street experience LOS C and LOS D conditions, respectively.

On First Street between C Street and A Street there are several pedestrian generators, including an elementary school, park, and public library on the east side of First Street and the pedestrian path under the railroad at B Street on the west side of First Street. There are striped pedestrian crossings at B Street and C Street with pedestrian crosswalk signs[4] installed between the through lane and center turn lane. However, both crossings require crossing a three-lane section with parking on either side and no curb bulb outs (approximately 55 feet). While the C Street crossing has a pedestrian activated flashing light and school crossing sign, the B Street crossing does not.

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[3] Level-of-service is provided on an A (low delay) to F (high delay) scale to represent the average delay experienced by a vehicle entering an intersection.

[4] Manual on Uniform Traffic Control Devices R1-6

FIGURE 3. CENTRAL AREA RAILROAD CROSSING

SOUTHWEST AREA FINDINGS

There is one at-grade railroad crossing in the Southwest Area, on Pitt School Road as shown in **Figure 4** (page 9). The crossing is located in unincorporated Solano County at the edge of Dixon city limits. When school is in session, the railroad crossing at Pitt School Road is used by school buses three times per day.

SOUTHWEST AREA SAFETY SUMMARY

There was one recorded collision at the Pitt School Road at-grade railroad crossing over the past 10 years, where an Amtrak train impacted a vehicle stopped on the tracks, resulting in a fatality. The intersection of Pitt School Road/Porter Street is located less than 100 feet to the north of the railroad crossing.

SOUTHWEST AREA TRAFFIC OPERATIONS SUMMARY

Pitt School Road/Porter Street is a skewed, all-way stop-controlled intersection. While the overall intersection delay is limited, the northbound approach has the potential spill back to the at-grade railroad crossing with only a few queued vehicles, particularly longer vehicles with trailers.

FIGURE 4. SOUTHWEST AREA RAILROAD CROSSING

CHAPTER 3. TRAFFIC IMPACTS OF RAIL CROSSING PROJECTS

Several major railroad crossing improvements have been proposed in Dixon, including:

- Pedrick Road overpass
- Vaughn Road realignment and at-grade crossing closure
- A Street underpass
- Parkway Boulevard grade separation
- Pitt School Road at-grade crossing closure
- H Street underpass[5]

To determine the impact that these railroad crossing improvements may have on the City's transportation system, three future (year 2040) scenarios were analyzed using the City's travel demand model. Each scenario included various combinations of roadway and capacity improvements as described below and summarized in **Figure 5** (page 12). The three scenarios included:

- **Baseline Scenario** - Includes land use assumptions and most transportation network projects consistent with analyses conducted for the most recent General Plan update, including the Vaughn Road realignment; the Parkway Boulevard grade separation project; and widening segments of Pedrick Road, Vaughn Road, and Parkway Boulevard to four lanes; among other projects.
- **Scenario A** – Includes all the Baseline Scenario network assumptions (including widening of Pedrick Road, Vaughn Road and Parkway Boulevard) except for the Vaughn Road realignment and Parkway Boulevard grade separation project.
- **Scenario B** – Includes all the Baseline Scenario network assumptions, including Vaughn Road realignment and Parkway Boulevard grade separation project plus the A Street underpass and a closure of the at-grade railroad crossing at Pitt School Road (closure of the south leg of Pitt School Road at Porter Road). Note that the A Street underpass would imply closure of the connection between the east leg of Porter Street and A Street and thus have only minimal impacts to traffic patterns.

EXPECTED CHANGES IN TRAFFIC PATTERNS

Overall, the traffic impact of the major rail crossing improvements is limited, with diversion focused to a few key areas in each scenario. **Figure 6A** and **Figure 6B** (page 13-14) show the approximate shift in peak hour traffic expected with Scenario A and Scenario B (relative to the Baseline Scenario). The following summarizes the major traffic shifts expected with each scenario:

- **Scenario A**: As shown in Figure 6A, motor vehicle volume shifts are relatively localized with the Vaughn Road realignment. Without the Parkway Boulevard grade separation, more traffic uses First Street and Midway Road, with fewer vehicles traveling on Pitt School Road.

[5] The H Street underpass was determined likely to be infeasible over the horizon of this plan, given funding constraints and regulatory challenges, and was not included in any of the scenarios modeled.

- **Scenario B**: As shown in Figure 6B, with the closure of the south leg of Pitt School Road at Porter Road, fewer vehicles travel along Pitt School Road, with people diverting to Midway Road to access Porter Road (approximately 25-50 vehicles) or to First Street to access the Parkway Boulevard grade separation. There is also a slight shift in motor vehicle volume due to the A Street underpass, which closes northbound right turn access at Porter Road/A Street, shifting slightly more northbound right turn traffic to Porter Road/Adams Street/A Street.

Given the limited diversion seen in the three scenarios, there were limited changes to the traffic operations at each of the study intersections between scenarios. At the study intersections where a capacity issue was identified or a project modified the intersection control (such as the realignment of Vaughn Road), multiple intersection control alternatives were tested to determine the appropriate recommended solution. The following chapter summarizes the recommended intersection improvements along with the railroad crossing safety improvements.

FIGURE 5. ROADWAY IMPROVEMENTS ASSUMED IN EACH FUTURE SCENARIO

FIGURE 6A. SCENARIO A: SHIFT IN PEAK HOUR MOTOR VEHICLE VOLUMES COMPARED TO BASELINE

FIGURE 6B. SCENARIO B: SHIFT IN PEAK HOUR MOTOR VEHICLE VOLUMES COMPARED TO BASELINE

CHAPTER 4: RECOMMENDED RAILROAD CROSSING SAFETY IMPROVEMENTS

Based on the safety and traffic analysis, a set of recommendations were made at each of the rail crossing locations. The recommended improvements were discussed on April 19th, 2021 at an on-site railroad diagnostic meeting, with representatives from UPRR, Dixon School District, California Public Utilities Commission, City of Dixon, Solano County, Caltrans and consultant project staff.

For each railroad crossing area, a recommendation was made for 1) improvements to the existing at-grade crossings and 2) a grade separation or crossing closure improvement. In general, the at-grade crossing improvements are lower in cost and can be implemented over the short term while grade separation is more costly and may take many years to implement. For more details on each of the recommended improvements, *see Appendix D: Railroad Crossing Improvements Technical Memorandum* and the meeting notes from the diagnostic meeting included in *Appendix E*. Note that cost estimates were refined for the final report and may be different than the preliminary estimates in the technical memorandums.

NORTHEAST AREA RAILROAD CROSSING IMPROVEMENTS

Figure 7 (page 16) and **Figure 8** (page 18) show the recommended rail crossing improvements in the northeast area. The recommended improvements are described in the following sections.

PEDRICK ROAD RAILROAD CROSSING RECOMMENDED IMPROVEMENTS

Figure 7 shows the recommended pedestrian and bicycle facility improvements to reduce the skew at the crossing. These improvements will become higher priority as the northeast area of Dixon continues to develop and becomes less rural in nature. The bikeway design should be consistent with the Class I multiuse path proposed on Pedrick Road in the Dixon General Plan 2040. In the interim, until the northeast area is fully developed, Class II bike lanes may be installed along Pedrick Road. Note this widening would require replacing the track structure at the crossing[6].

In addition, it is recommended that signing and striping be upgraded to meet current California *Manual on Uniform Traffic Control Device* (CA MUTCD)[7] standards. Signage warning of the railroad skew angle and associated bike issue (bicycle tires getting stuck in tracks) could be added until the multiuse path is constructed.

As a long-term solution, the at-grade crossing at Pedrick Road could be eliminated through a grade-separation project. An overcrossing would eliminate any potential conflicts between the railroad and people walking, biking, or driving. It would also improve reliability by eliminating delays associated with the rail crossings and could help accommodate demand from special event

[6] Note that UPRR policies indicate that mitigations for widening the roadway for motor vehicle traffic must include grade separations or crossing closures; however, this is not required for minor widening for pedestrian or bicycle treatments.

[7] California Manual on Uniform Traffic Control Devices (MUTCD) 2014 Edition Revision 5 March 27, 2020. Federal Highway Administration.

traffic associated with the fairground. However, grade-separation is an expensive solution and funding the Parkway Boulevard grade separation will remain a higher priority for the City prior to considering other grade-separation opportunities.

FIGURE 7. PEDRICK ROAD AT-GRADE RAIL CROSSING SAFETY IMPROVEMENTS

VAUGHN ROAD RAILROAD CROSSING RECOMMENDED IMPROVEMENTS

Consistent with the Dixon General Plan 2040, a realignment of Vaughn Road is recommended to eliminate the at-grade railroad crossing at Vaughn Road, as shown in **Figure 8** (page 18). Note that the improvements shown in Figure 8 are conceptual in nature and will be refined during a future design phase. The realignment would create a new intersection with Pedrick Road (located approximately 700 feet north of the railroad crossing to be forward compatible with a future overpass on Pedrick Road).

The new intersection would meet the City's delay standards as a two-way stop-controlled intersection with added turn lanes shown in Figure 8. However, a roundabout could also be considered at this location, provided it is designed to accommodate the heavy vehicles and farm equipment that travel through the intersection to access the nearby industrial and agricultural areas. Roundabouts reduce crashes and in particular reduce the severity of crashes (up to 82 percent reduction[8] in severe crashes compared to two-way stop-controlled intersections) but are generally more costly (increasing the cost of the realignment by approximately $2 million dollars). Given the distance between the realigned intersection and the railroad crossing (approximately 700 feet), no vehicle queues are expected to impact the railroad crossing, with northbound queues only expected to extend less than 50 feet during future peak hours. However, implementing a roundabout may require additional coordination with UPRR.

Vaughn Road is identified as an arterial roadway in the Dixon General Plan 2040. While the City standard for an arterial roadway is a five-lane cross section[9], based on the 2040 forecast motor vehicle volumes on Vaughn Road the realigned cross section could be built as a three-lane roadway with right-of-way maintained for a future five-lane cross section. Figure 8 shows the proposed cross section for the new Vaughn Road realignment as well as access to the adjacent industrial land uses (based on the City Standard Industrial Street Section). The cross section shown would be consistent with the planned Class I multi-use path[10]. Wayfinding signage could be added to help direct people biking to the new multi-use path on Pedrick Road and to continue on the Solano County Dixon-Davis Bikeway on Vaughn Road.

[8] Crash Modification Factors Clearinghouse, CMF ID 228

[9] City of Dixon Engineering Design Standard, Figure 3-4H

[10] Dixon General Plan 2040

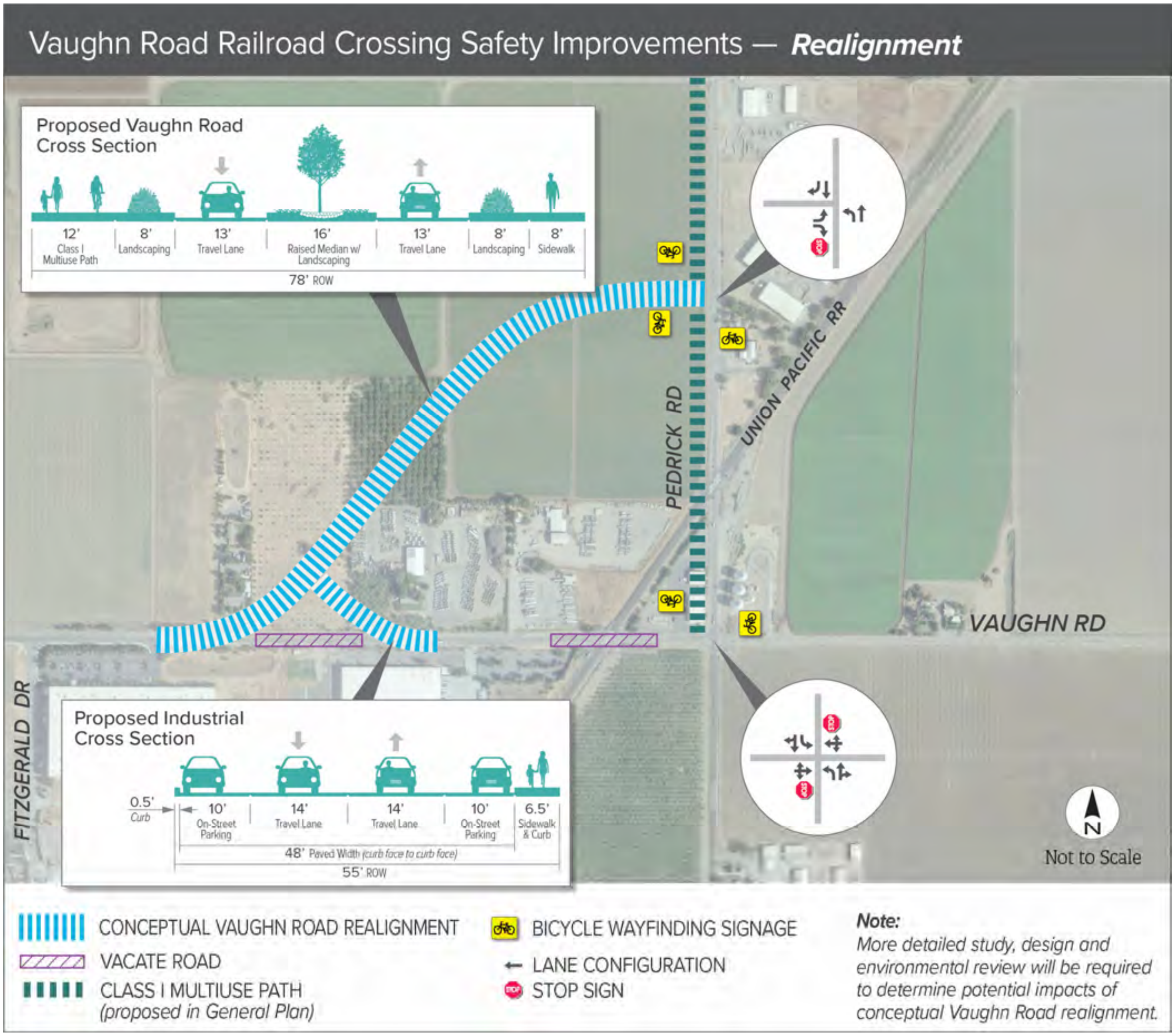

FIGURE 8. VAUGHN ROAD REALIGNMENT AND AT-GRADE RAILROAD CROSSING CLOSURE

CENTRAL AREA RAILROAD CROSSING IMPROVEMENTS

The recommended improvements at the First Street and A Street railroad crossings are described in the following sections, as well as other safety enhancements in the central area.

FIRST STREET RAILROAD CROSSING RECOMMENDED IMPROVEMENTS

Safety improvements at the First Street (SR 113) crossing were recently constructed in December 2019; accepted in the spring of 2020. Therefore, the only additional improvements recommended at this location include enhanced street lighting and simplifying signage near the railroad crossing, as detailed in *Appendix E: Diagnostic Meeting Minutes*.

Note that Federal regulations[11] specify that "all crossings of railroads and highways at grade shall be eliminated where there is full control of access on the highway (a freeway) regardless of the volume of railroad or highway traffic". While this requirement does not apply on First Street (SR 113) as the highway is not fully access controlled, grade separation could be considered at this location but would require a detailed feasibility study to understand the impacts of a grade separated structure through downtown Dixon.

A STREET RAILROAD CROSSING RECOMMENDED IMPROVEMENTS

Figure 9 (page 20) shows the recommended at-grade crossing improvements on A Street. Note that the improvements shown in Figure 9 are conceptual in nature and will be refined during a future design phase. The recommended improvements include:

- **Improved signal timing at A Street/Porter Street/Adams Street:** Implementing advanced rail preemption signal timing at the intersection can add longer track clearance times prior to the railroad gate arms coming down. This will give more time to clear any queues that may extend onto the railroad to ensure that vehicles do not block the tracks during a train crossing event.
- **Upgraded signing and striping:** It is recommended that signing and striping at the railroad be upgraded to meet current CA MUTCD standards. Signage near the railroad should be simplified where possible. Pedestrian scaled wayfinding signage could also be added near the A Street railroad crossing to direct people walking and biking to the B Street underpass during a longer rail crossing event.
- **Enhanced overhead street lighting**: There is currently limited overhead street lighting near the railroad crossing. Additional lighting is recommended to improve visibility at the railroad crossing during night.
- **Bicycle and pedestrian facility improvements**: To reduce the crossing skew and improve sidewalk conditions at the railroad crossing, it is recommended that the sidewalk and bicycle facilities be realigned as shown in Figure 9. The multiuse path alignment is currently shown outside of the existing City right-of-way to allow the path to cross the railroad tracks at a 90-degree angle and limit the impact to the railroad right-of-way. During a future design phase, the path could instead be designed to cross the railroad tracks at a skew angle but with a wider path to allow bicycles to choose a path perpendicular to the tracks. Automatic pedestrian gate arms can be added to improve safety and reduce the risk of collisions between trains and people walking. Note this widening would require replacing the track structure at the crossing.
- **Regrade railroad crossing**: The A Street approach to the railroad crossing is extremely steep and it is recommended that the roadway be regraded to reduce the slope at the crossing and reduce wear on vehicles traveling along A Street.
- **Close Porter Road access to A Street between Porter Road/Adams Road and railroad**: To reduce the number of motor vehicle conflicts near the railroad, it is recommended that the south leg access to A Street east of the substation be closed. This currently serves as a northbound right turn only.

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[11] 23 CFR 646.214(c)

In addition to the lower-cost recommendations listed above and shown in Figure 9, grade-separation was considered at the A Street railroad crossing. The feasibility of an underpass with a connection to a passenger rail station at A Street was previously studied in 2009[12]. The underpass would grade-separate rail traffic from motor vehicles and people walking and biking. However, UPRR no longer allows railroad underpasses as a matter of policy and instead strongly favors overpasses.

Given the proximity of Porter Street/Adams Street and Jackson Street to the railroad crossing, grade-separation will remain a challenge at A Street and would be a costly solution. Prior to grade-separation on A Street, the Parkway Boulevard grade separation should be constructed to provide an alternate route to A Street during any future construction requiring a full or partial closure of A Street.

FIGURE 9. A STREET RAILROAD CROSSING SAFETY IMPROVEMENTS

[12] *West A Street Grade Separation Project: Feasibility Study*, City of Dixon, July 2009

ADDITIONAL CENTRAL AREA CAPACITY AND SAFETY RECOMMENDED IMPROVEMENTS

Based on the safety review and traffic analysis, two additional improvements are recommended in the central area.

Jackson Street/A Street Intersection Improvements

Based on the traffic analysis, Jackson Street/A Street was identified as having high delay on the northbound approach, due to heavy left turn volumes. To help address the high levels of delay, a northbound left turn restriction is proposed at Jackson Street/A Street. While an all-way stop-controlled intersection may meet City mobility standards, it is likely that eastbound queues may back up towards the railroad crossing, creating a safety concern.

Signing restricting the northbound left turn at Jackson Street/A Street may be paired with traffic calming measures along Jackson Street, as well as right turn channelization (a porkchop) using a mountable curb design (traversable by emergency vehicles) to enhance compliance. In addition, the northbound left turn queue at First Street/A Street should be monitored after installing turn restrictions at Jackson Street/A Street. If left turn queues frequently extend into the through lane and block northbound through traffic, the turn lane may be restriped and lengthened to increase available storage for northbound left turning vehicles. This may be accommodated in the existing curb lines with select parking restrictions (impacting approximately five existing on-street parking spaces) on First Street between A Street and Mayes Street, as shown in **Figure 10** (page 22).

First Street Enhanced Pedestrian Crossing Improvements

Enhanced pedestrian crossings along First Street are needed to accommodate people walking to/from the B Street pedestrian tunnel on the west side of First Street and various pedestrian generators on the east side (e.g., Dixon Public Library, Women's Improvement Club Park and Linford Anderson Elementary School). The need for enhanced pedestrian crossings on First Street has been previously identified in the *Dixon Active Transportation Plan* and the *Solano County Travel Safety Plan*. As shown in **Figure 11** (page 23), pedestrian curb extensions and curb ramps may be added at B Street (all corners) to help reduce the crossing distance and make crossing pedestrians and bicyclists more visible to drivers. Pavement markings, such as sharrows, may also be installed along B Street to encourage drivers to share the road with bicycles. Given the proximity to the railroad, it is recommended that the rectangular rapid flashing beacon (RRFB) be moved from C Street to the enhanced pedestrian crossing at B Street. This would also better connect to many of the pedestrian generators in downtown Dixon and the pedestrian tunnel at B Street. The RRFB should be upgraded to include flashing beacons on both sides of the sign, in compliance with the CA MUTCD.

FIGURE 10. OPTIONAL MITIGATION FOR FIRST STREET QUEUEING

FIGURE 11. FIRST STREET ENHANCED PEDESTRIAN CROSSING OPPORTUNITIES

SOUTHWEST AREA RAILROAD CROSSING IMPROVEMENTS

Two improvements are recommended at the southwest rail crossings, including an at-grade railroad crossing closure at Pitt School Road and construction of the Parkway Boulevard grade separation. Both improvements are discussed in more detail below.

Note that the County is currently pursuing implementation of at-grade crossing safety improvements, including adding a median on Pitt School Road, realigning the gate arm and restriping the intersection. Therefore, no additional short-term at-grade safety improvements beyond upgrading signage and striping to CA MUTCD standards are recommended at the Pitt School Road railroad crossing at this time.

PITT SCHOOL ROAD RAILROAD CROSSING RECOMMENDED IMPROVEMENTS

Figure 12 (page 25) shows the recommended improvements in the southwest area. It is recommended that the at-grade railroad crossing at Pitt School Road be closed and the Parkway Boulevard grade separation be constructed. There was a fatal crash at Pitt School Road in 2017 due to a vehicle being stopped on the railroad tracks. A closure of the Pitt School Road at-grade railroad crossing would eliminate conflicts between the railroad and people walking, biking, and driving. Closure of the existing at-grade crossing would require pavement removal, removal of the culvert, extending the ditch and adding necessary barriers near the railroad to block motor vehicle, pedestrian and bicycle access. The creation of a cul-de-sac on the south side of the railroad tracks to allow vehicles to make a U-turn would also be required. In addition, the Vacaville-Dixon Bike Route (identified in the 2012 *Solano Countywide Bicycle Plan*) currently travels along Pitt School Road to Hawkins Road and it is recommended that an alternate bike route be identified with a closure at Pitt School Road.

With the closure, the intersection is recommended to be reconfigured to a three-leg intersection with two-way stop-control, as shown in Figure 12. If the intersection is converted to two-way stop-control, rumble strips or other improvements such as a flashing yellow warning light should be considered to alert drivers on Porter Road of an approaching intersection and help reduce vehicle speeds on Porter Road. As discussed in the *Traffic Impact Analysis Technical Memorandum* (Appendix C), the closure of the south leg of the Pitt School Road/Porter Road intersection would reduce overall delay at the intersection but would increase the out-of-direction travel for some drivers, who would instead divert to Midway Road or use the proposed Parkway Boulevard grade separation. Diversion onto Midway Road is expected to be minor, with only 25-50 additional peak hour trips in each direction at the intersection by 2040 (approximately 800-900 daily trips). At-grade rail crossing improvements may be considered by Solano County at Midway Road given the crash history at this location (five incidents at the rail crossing since 2007).

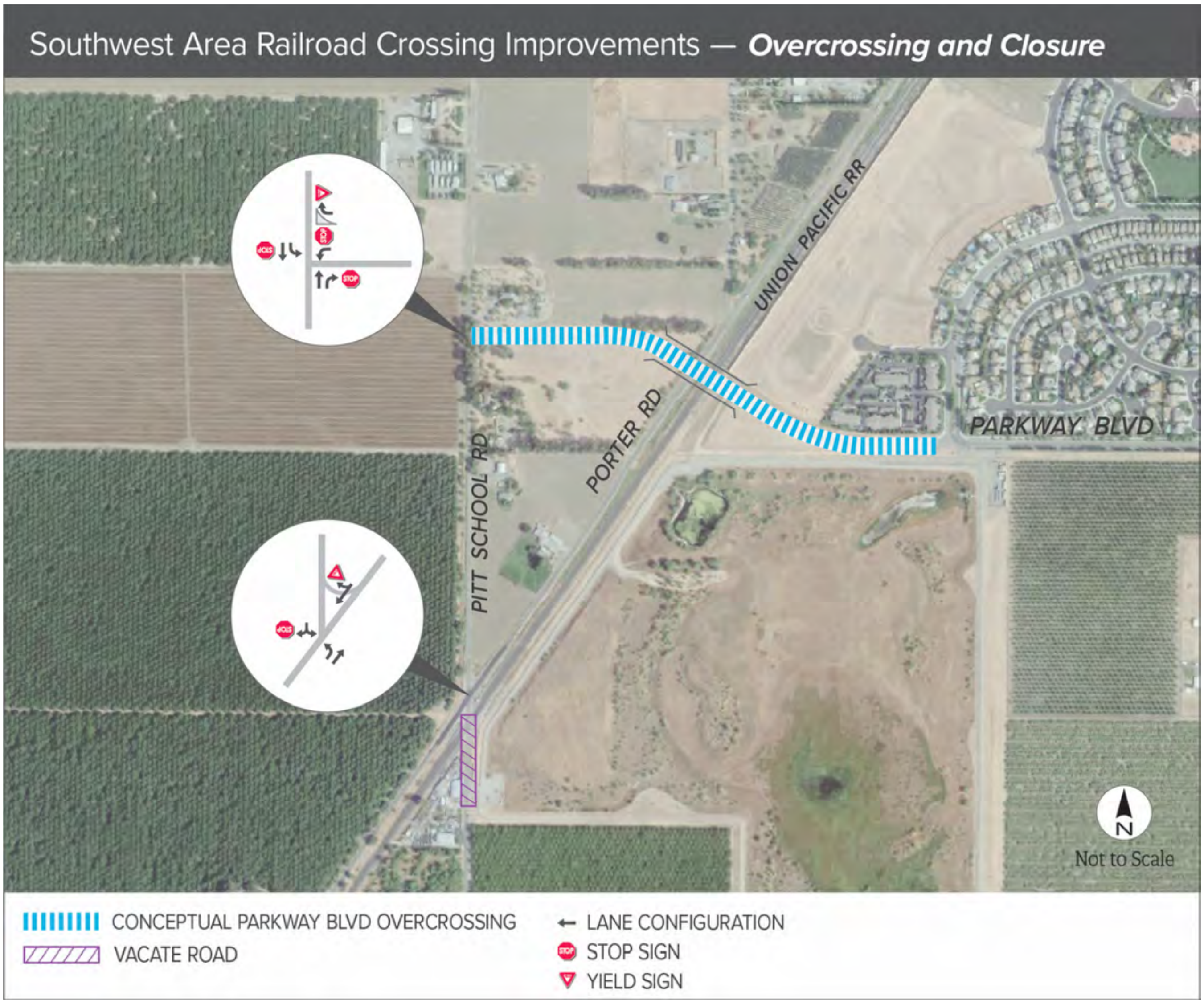

FIGURE 12. SOUTHWEST AREA RAILROAD CROSSING IMPROVEMENTS – GRADE SEPARATION AND CLOSURE

Figure 12 also shows the Parkway Boulevard grade separation, which has been a priority for the City since 1997[13]. The Parkway Boulevard grade separation will be the first grade separated motor vehicle crossing of the railroad within the City. It provides an alternative route for vehicles when longer train crossing events or incidents occur and enhances access for emergency responders. The Parkway Boulevard grade separation also provides an alternate option to the at-grade Pitt School Road crossing, which had a fatal motor vehicle/train crash in 2017. The grade separation connects the large southwest growth area to Dixon High School and provides an additional route to the

[13] https://sta.ca.gov/project/parkway-boulevard-grade-separation-project/

downtown area. With a future extension of Parkway Boulevard to Pitt School Road, this project also provides a bypass to congestion downtown and along First Street.

To accommodate the traffic shifts associated with the grade separation and Pitt School Road at-grade crossing closure, Figure 12 shows the recommended lane configuration and traffic control. Based on current traffic forecasts, the previously identified four-lane cross section is not needed on Parkway Boulevard in the 20-year planning horizon. However, to accommodate future traffic demand beyond the 20-year planning horizon, particularly as Dixon continues to grow to the south of the current City limits, a bridge structure that can accommodate a four-lane roadway is recommended (note that the bridge is designed to a 100-year design life).

Figure 13 (page 27) shows an example[14] of an interim cross section that may be implemented on Parkway Boulevard and on the bridge. The example cross sections include a Class I multiuse path as the proposed bridge helps connect the west and east side of Dixon, providing access to/from Dixon High School and I-80 while eliminating conflicts and delay associated with train crossings. The Class I multiuse path provides separation from motor vehicle traffic and is consistent with the City's "complete streets" policy. Once traffic demand beyond the 20-year planning horizon warrants expanding to two travel lanes in each direction, the roadway cross section may be reallocated to accommodate four lanes of motor vehicle traffic. It is recommended that the bridge design accommodate both an interim and long-term configuration.

Note that to enhance bicycle connectivity to the proposed Class I multiuse path on Parkway Boulevard, continuous bicycle facilities would need to be implemented along Pitt School Road. Pitt School Road is planned as a Class I multiuse path (with existing Class II bicycle facilities) from A Street to the Dixon city limits. However, Pitt School Road is a County facility from Dixon city limits to the Parkway Boulevard grade separation (approximately 1,200 feet) with no planned bicycle facilities. Installing bicycle facilities on this section of Pitt School Road to complete the bicycle network connectivity is recommended. Ideally, the bicycle facilities would be consistent with improvements elsewhere on Parkway Boulevard and Pitt School Road (i.e., a Class I multiuse path) and include a protected intersection design to connect to Parkway Boulevard. However, installing any new bicycle facilities on Pitt School Road will have right-of-way implications and additional coordination will be required with the County (or the City's acquisition of this section of Pitt School Road will be necessary).

[14] Note that design is currently on-going for the Parkway Boulevard grade separation and the bridge width or cross section is subject to change as design progresses.

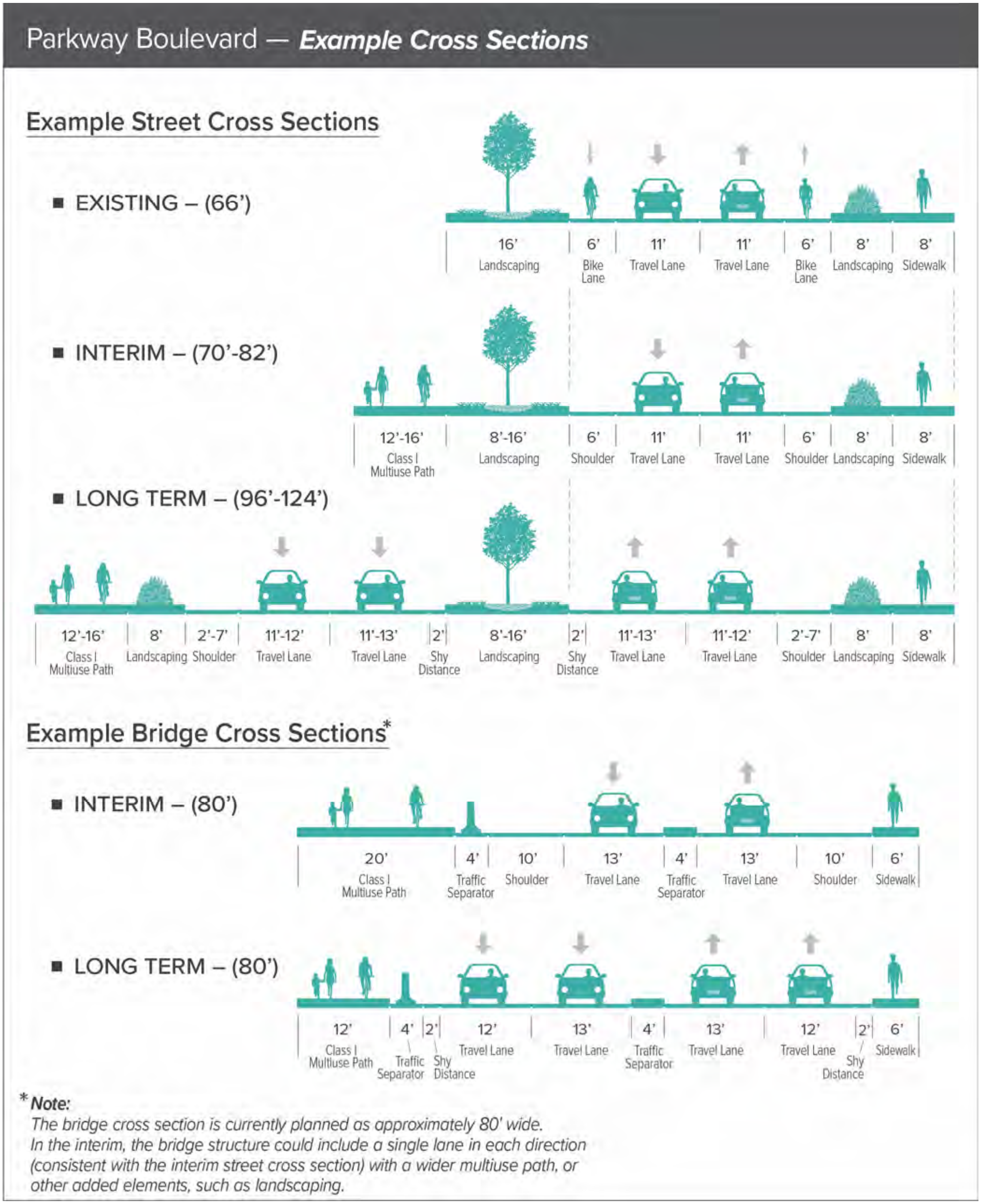

FIGURE 13. EXAMPLE PARKWAY BOULEVARD CROSS SECTION

SUMMARY OF RECOMMENDED IMPROVEMENTS

Table 2 (page 29) summarizes the recommend railroad crossing improvements near each of the five at-grade railroad crossing locations in Dixon and includes a planning level cost estimate for each project[15]. A detailed breakdown of assumptions for the planning level cost estimate can be found in the appendix. Priority projects include:

- Pitt School Road at-grade railroad crossing closure
- Parkway Boulevard grade separation
- Vaughn Road realignment and Vaughn Road at-grade railroad crossing closure
- At-grade railroad crossing improvements on A Street and other central area capacity and safety improvements

For guidance on coordinating these recommended improvements with UPRR, see the Public Projects Manual[16].

FUNDING CONSIDERATIONS

Recommended improvements at each of the five at-grade railroad crossing locations range in cost from a few thousand dollars to upwards of $35 million dollars. There are several potential funding sources for the recommended improvements, as described below.

SECTION 130 PROGRAM FUNDING

The Railway-Highway At-grade Crossings program (Section 130) provides funding to help eliminate hazards at-grade crossings, with matching funding available from the railroad for closure of crossings. To receive funding, the project must be on a public road and included on the California Public Utility Commissions' Section 130 Priority list and included in the appropriate the Federal Transportation Improvement Program (FTIP) and Federal Statewide Transportation Improvement Program (FSTIP) list. Funding from this program could help fund the recommended improvements at the Vaughn Road railroad crossing and the Pitt School Road railroad crossing.

[15] Planning level cost estimates indicate a 0-2% project definition and cost estimates may range from +100% to -50%. As the recommended solution becomes more defined through additional planning and design, the cost estimates will continue to be refined and will have less variation in range. Cost incorporates design and construction costs but do not incorporate maintenance costs.

[16] Union Pacific Railroad Public Projects Manual, Version 001, July 2021, https://www.up.com/cs/groups/public/@uprr/@corprel/documents/up_pdf_nativedocs/pdf_up_public_projects_manual.pdf

TABLE 2: SUMMARY OF RECOMMENDED RAILROAD CROSSING IMPROVEMENTS

RAILROAD CROSSING	JURIS-DICTION	TYPE OF IMPROVEMENT	RECOMMENDED IMPROVEMENT	PLANNING LEVEL COST ESTIMATE
PEDRICK ROAD	City/ County	At-Grade	At-grade crossing improvements including striping, signing and enhanced pedestrian and bicycle facilities	$960K
		Grade Separation/ Crossing Closure	Pedrick Road overpass is recommended as a long-term solution	$25M
VAUGHN ROAD	City/ County	At-Grade	None	-
		Grade Separation/ Crossing Closure	Vaughn Road realignment and at-grade crossing closure	$5.5M
FIRST STREET	City	At-Grade	Enhanced overhead street lighting near the railroad crossing and enhanced pedestrian crossings on First Street	$213K[a]
		Grade Separation/ Crossing Closure	None	-
A STREET	City	At-Grade	At-grade crossing improvements including enhanced pedestrian and bicycle facilities, automatic pedestrian gate arms, enhanced overhead street lighting, wayfinding signage	$1.45M
		Grade Separation/ Crossing Closure	A Street underpass has been studied previously and is preferred by the City as a long-term solution. Note that UPRR no longer allows railroad underpasses as a matter of policy and instead strongly favors overcrossings	$35M
PITT SCHOOL ROAD	County	At-Grade	The County is currently pursuing at-grade crossing improvements at this location including adding a median on Pitt School Road, realigning the gate arm and restriping the intersection. Additional improvements include upgrading signing and striping to MUTCD standard.	$27K
		Grade Separation/ Crossing Closure	Closure of the at-grade crossing, construction of Parkway Boulevard grade separation	$25M

a) Cost estimate also includes minor improvements at Jackson/A Street intersection

SECTION 190 PROGRAM FUNDING

Another potential source of funding for grade separation of railroad crossings is the Caltrans Railroad-Highway Grade Crossing Program (RHGCP), also known as the Section 190 program. This competitive grant program provides $15 million each year to local agencies for the construction of grade separation projects. Up to $5 million dollars per year (up to $20 million over multiple years) can be used by an individual agency once every 10 years. Projects are prioritized for funding based on criteria such as daily vehicle/train traffic, crash history, delay, and other identified funding sources. Based on the criteria for the program, the Parkway Boulevard grade separation has the greatest likelihood of funding through the Section 190 program, followed by the A Street underpass and the Pedrick Road overpass.

TRANSPORTATION IMPACT FEES

A Transportation Impact Fee (TIF) provides funding to address mobility or safety deficiencies on transportation facilities expected to be used by new development in Dixon. Both the City and County have TIF that could help pay for a portion of these recommended improvements. In particular, the Parkway Boulevard grade separation is included in the City's current TIF.

APPENDIX CONTENTS

SECTION A. DATA COLLECTION METHODOLOGY

1970 BROADWAY, SUITE 740, OAKLAND, CA 94612 • 510.763.2061 • DKSASSOCIATES.COM

MEMORANDUM

DATE: October 21, 2020

TO: Deborah Barr | City of Dixon

Joe Leach | City of Dixon

FROM: Erin Vaca | DKS Associates

Sean Carney | DKS Associates

SUBJECT: Data Collection Plan for Dixon Area Advanced Traffic and Railroad Safety Study

Project # 20172-000

This memorandum summarizes the existing data available and the data which needs to be collected for the Dixon Railroad Crossing Safety Study. Given the current situation with COVID-19, traffic is lower than typical travel conditions and is unlikely to rebound to pre-COVID-19 levels for several years. In the interest of timely completion of this study, this memorandum proposes a data collection and adjustment strategy to estimate typical traffic levels.

EXISTING DATA AVAILABLE

There are two main sources of previous count data which this study is proposing to use to establish typical traffic conditions: ADT counts from 2019 that were collected in 2019 for the travel demand model update and turning movement counts from 2019 collected for the general plan update. This data is shown in the map in Figure 1.

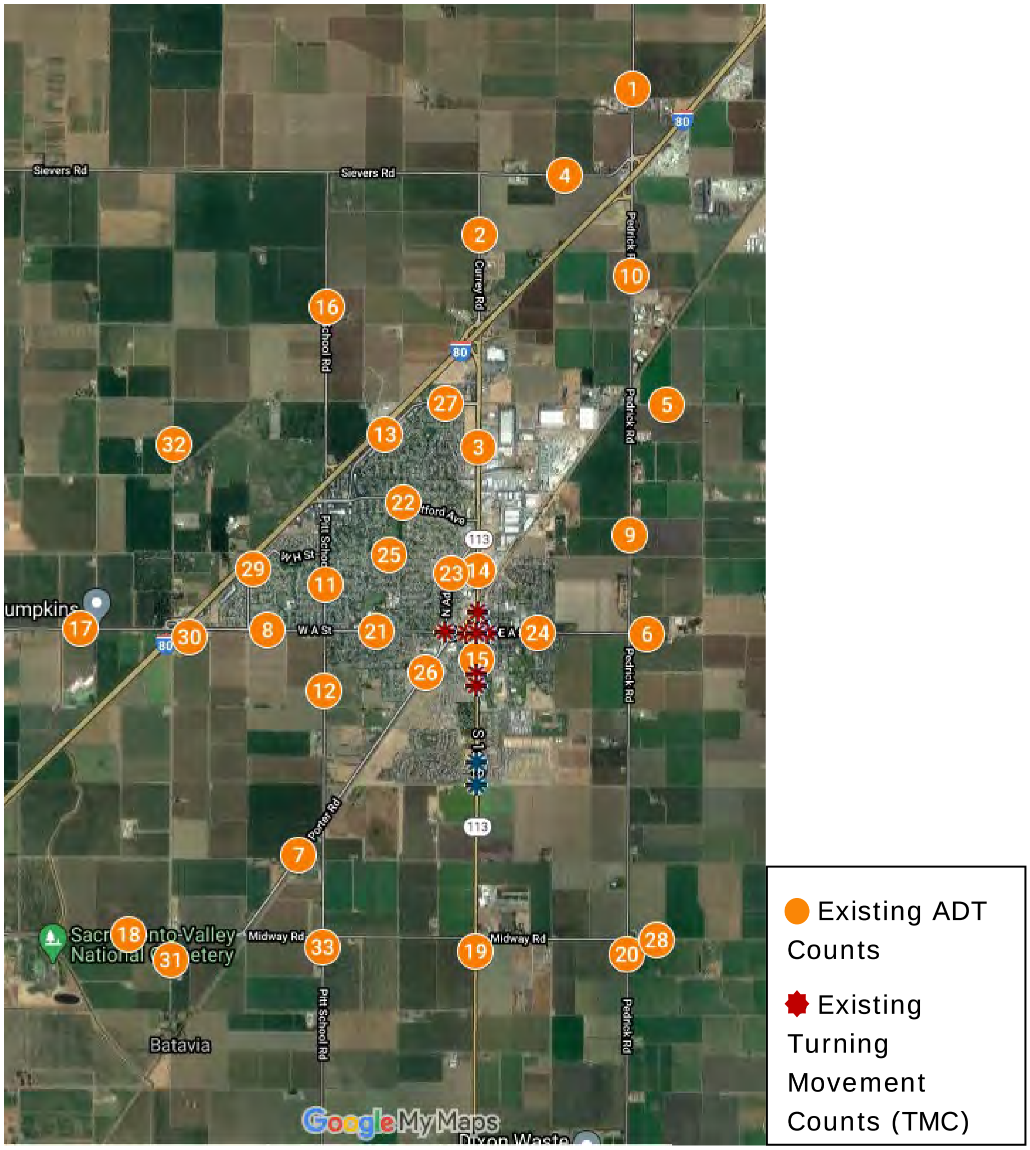

FIGURE 1: EXISTING DATA AVAILABLE

Figure 2 shows the locations of the rail crossings being studied and the intersection will be analyzed as likely impacted by changes made to the crossings. Of the seven intersections analyzed, four overlap with the previously collected turning movement counts and no new counts will need to be collected for those locations. The three remaining locations will require new turning movement counts. These are: Pedrick Road and Vaughn Road, Pitt School Road and A Street, and Pitt School Road and Porter Road. To estimate what pre-pandemic traffic levels were at these locations, recounts are recommended at the following segment locations that were collected in 2019:

- 5: Vaughn Road east of Pedrick Road
- 7: Porter Road west of Pitt School Road
- 8: A Street west of Pitt School Road
- 9: Pedrick Road south of Vaughn Road
- 10: Pedrick Road north of Vaughn Road
- 11: Pitt School Road north of A Street
- 12: Pitt School Road south of A street
- 21: A Street east of Pitt School Road

These segment counts will be compared to 2019 to determine growth factors for the study intersections to shift the 2020 counts to a 2019 baseline. Where growth factors vary greatly between legs of the intersection, a Fratar factoring process will be applied to the turning movements to balance inbound and outbound counts. If growth factors are found to be similar across all recounted locations (less than 10% difference), then a single factor will be applied across all turning movements.

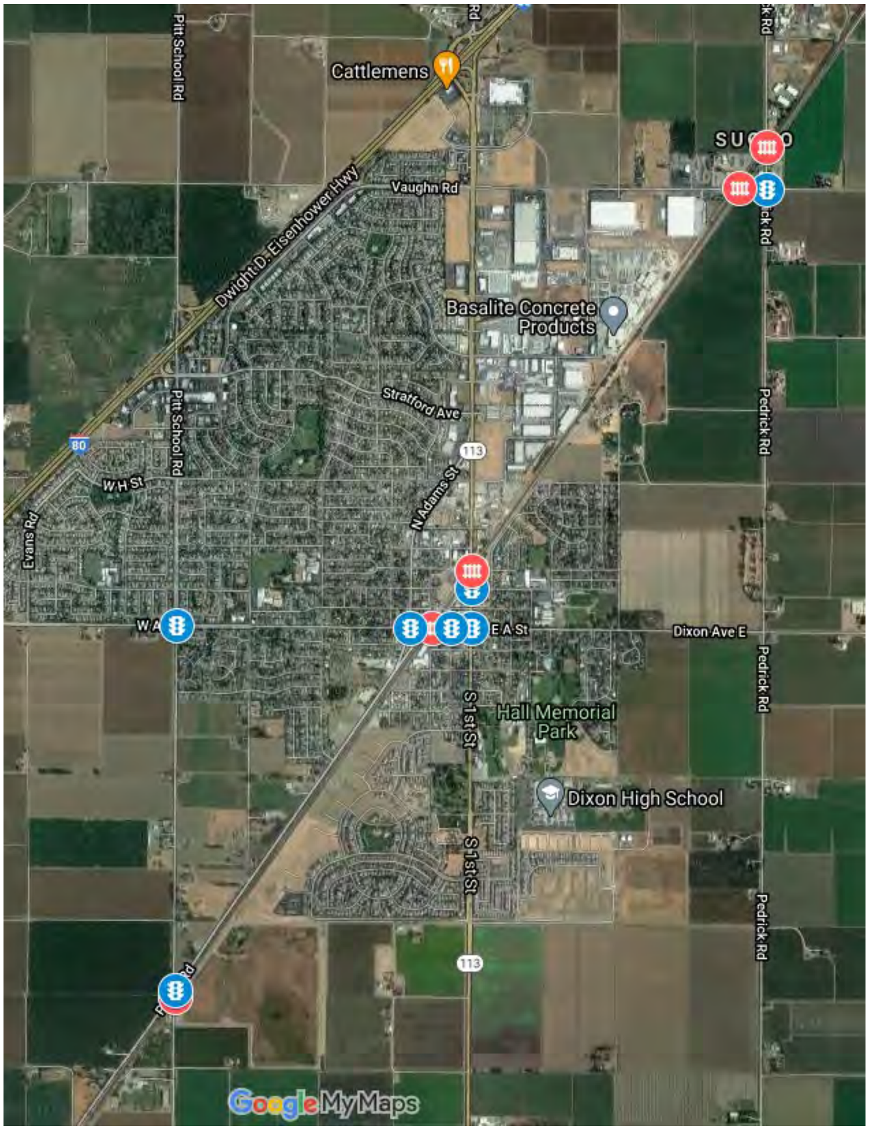

FIGURE 2: STUDY INTERSECTIONS AND RAIL CROSSINGS

- Currey Road & westbound I-80 Ramps
- N. First Street/SR-113 & eastbound I-80 Ramps
- Pitt School Road & westbound I-80 Ramps
- Stratford Avenue/Pitt School Road & eastbound I-80 Ramps
- Schroeder Road/Dixon Avenue West & westbound I-80 Ramps
- Batavia Road/West A Street & eastbound I-80 Ramps

Similar to the methodology previously described for the rail crossings study, several segments will require recounting to develop adjustment factors for the intersection turning movement counts. These include:

- 2: Currey Road north of I-80
- 3: First Street south of Vaughn Road
- 8: Dixon Road east of Evans Road
- 11: Pitt School Road south of I-80[1]
- 16: Pitt School Road north of I-80
- 17: Dixon Road west of I-80
- 30: Batavia Road south of Dixon Road

SAFETY DATA COLLECTION

DKS Associates will coordinate with the Solano Transportation Authority (STA) to obtain local crash data for all study locations. The most recent 5 years of data available for each location will be requested for analysis. Crashes will be associated with rail crossings if they occurred within 500 feet of a rail crossing location. Crashes will be associated with an intersection if they occurred within 250 feet of the intersection stop bar. Crash rates will be reported as crashes per million entering vehicles (MEV) per year. This is in line with California standards for safety studies per the California Local Road Safety Manual (LRSM).

[1] Needed as part of the rail study

SECTION B. COLLISION DATA AND SAFETY ANALYSIS MEMORANDUM

DKS 1970 BROADWAY, SUITE 740, OAKLAND, CA 94612 • 510.763.2061 • DKSASSOCIATES.COM

COLLISION DATA AND SAFETY ANALYSIS

DATE: March 08, 2021

TO: Deborah Barr, Joe Leach | City of Dixon

FROM: Erin Vaca, Josh Pilachowski, Sean Carney | DKS Associates

SUBJECT: Dixon Railroad Crossing Safety Study – Task 3 Safety Memo Project # 20172-000

This memorandum summarizes the crash history and current conditions at seven study intersections and five at-grade rail crossings in the City of Dixon. Intersections crashes and configurations are analyzed with the specific purpose of determining if safety is potentially impacted by queues or stopped vehicles occurring during a passing train event.

SUMMARY OF TRENDS AND IDENTIFIED DEFICIENCIES

The key trends and deficiencies identified from the analysis summarized in this document provide a conclusion and overall direction for potential mitigations. A summary of crashes that have occurred at each of the study locations is provided in Table 1. A summary of these trends and deficiencies for collisions involving or adjacent to rail crossings in Dixon are as follows:

- Observed collisions at rail crossings are exceedingly rare, having only occurred twice in the past 10 years. However, both collisions resulted in a fatality (one pedestrian, one driver).
- Overhead street lighting and signage/striping is minimal at all locations approaching railroad crossings
- There is minimal support for safe pedestrian and bicycle railroad crossing
- Single arms and lack of medians make it easy for cars to cross tracks in advance of a passing train event

TABLE 1: CRASH SUMMARY

ID	LOCATION	TYPE	TOTAL CRASHES	PROPERTY DAMAGE ONLY	VISIBLE OR POSSIBLE INJURY	SERIOUS INJURY OR FATALITY
1A	PEDRICK RD CROSSING	Railroad Crossing	0	0	0	0
1B	VAUGHN RD CROSSING	Railroad Crossing	0	0	0	0
1C	PEDRICK RD & VAUGHN RD	Intersection	1	1	0	0
2A	FIRST ST CROSSING	Railroad Crossing	1	0	0	1
2B	FIRST ST & C ST	Intersection	5	4	1	0
2C/ 2D	N ADAMS/PORTER ST & A ST	Intersection	6	4	2	0
2E	A ST CROSSING	Railroad Crossing	0	0	0	0
2F	JACKSON ST & A ST	Intersection	8	7	1	0
2G	FIRST ST & A ST	Intersection	11	9	2	0
3A	PITT SCHOOL RD CROSSING	Railroad Crossing	1	0	0	1
3B	PITT SCHOOL RD AND PORTER ST	Intersection	0	0	0	0

Source: SWITRS, 2020, https://www.chp.ca.gov/programs-services/services-information/switrs-internet-statewide-integrated-traffic-records-system

Federal Rail Administration Crossing Inventory & Accident Reports, 2020

DATA COLLECTION

Figure 1 shows the locations of the rail crossings being studied and the intersections that will be analyzed as part of the rail crossings study[1]. Crash data was obtained through multiple sources, including:

- The California Statewide Integrated Traffic Records System (SWITRS) – All recorded crashes from the California Highway Patrol and local police departments
- UC Berkeley Transportation Injury Mapping System (TIMS) –Processed and geolocated data for injury crashes only
- Federal Rail Administration (FRA) Crossing Inventory & Accident Reports – Rail crossing crash records from Amtrak and Union Pacific Railroad Company

Analysis includes five years of intersection crashes, and ten years of railroad crossing crash records, given the relative rarity of events. To support the analysis of crash records, a field visit of the five crossing locations and nearby study intersections was performed in November 2020 and documented with photos and observations of current operations and any safety deficiencies.

REVIEW OF SAFETY FINDINGS BY LOCATION

A summary of each study location is provided below, along with number of recent crashes and observations from the field visit. The discussion is grouped into three subareas where rail crossings are immediately adjacent to public street intersections.

1. Northeast Rail Crossings (Pedrick Road and Vaughn Road)
2. Central Rail Crossings (First Street and A Street)
3. Southwest Rail Crossings (Pitt School Road)

1. NORTHEAST RAIL CROSSINGS AND NEARBY INTERSECTIONS

Figure 2 shows each of the rail crossings and nearby study intersections in the northeast area and summarizes constraints identified during the field visit. Each crossing and intersection are discussed in more detail below.

[1] Note that crash data was not analyzed at the intersection of Pitt School Road/W A Street (3C) as it is well outside the influence area of any of the crossings and is only included as a study intersection to determine potential traffic impacts of future scenarios.

FIGURE 1: STUDY INTERSECTIONS AND RAIL CROSSINGS

FIGURE 2: NORTHEAST RAIL CROSSINGS AND NEARBY INTERSECTIONS

A. PEDRICK ROAD CROSSING

Pedrick Road runs north and south with a double rail crossing at an oblique angle as shown in Figure 2. There is minimal advance warning of the crossing with a single sign and striping located 500 feet to the north and south with no overhead street lighting. A single rail crossing arm with warning lights is installed in front of a stop bar on each approach.

There were no recorded collisions at the railroad crossing in the past 10 years.

B. VAUGHN ROAD CROSSING

Vaughn Road runs east and west with a double rail crossing at an oblique angle as shown in Figure 2. There is minimal advance warning of the crossing with a single sign and striping located 350 feet and 230 feet respectively to the east and west with no overhead street lighting. A single rail crossing arm with warning lights is installed in front of a stop bar on each approach. Vaughn Road has a signed and striped Class II bike lane running in both directions across the tracks, however there is no bicycle-specific warning signage. The skewed angle of the tracks along with parallel grooves in the road surface represent a potential hazard for bicyclists that may catch the wheel of a bicycle.

There were no recorded collisions at the railroad crossing in the past 10 years.

C. INTERSECTION OF PEDRICK ROAD AND VAUGHN ROAD

The intersection of Pedrick Road and Vaughn Road is an all-way stop-controlled intersection with a single lane of approach in all directions as shown in Figure 2. The intersection is 650 feet south of the Pedrick Road crossing and 415 feet to the east of the Vaughn Road crossing. There is a single overhead streetlight installed at the intersection.

There has been only one crash at this intersection in the past five years, however it involved a vehicle that overturned after travelling at an unsafe speed and is probably unrelated to any crossing event.

2. CENTRAL RAIL CROSSINGS AND NEARBY INTERSECTIONS

Figure 3 shows each of the rail crossings and nearby study intersections in the central area and summarizes constraints identified during the field visit. Each crossing and intersection are discussed in more detail below.

FIGURE 3: CENTRAL RAIL CROSSINGS AND NEARBY INTERSECTIONS

A. FIRST STREET CROSSING

First Street runs north and south with a double rail crossing at an oblique angle as shown in Figure 3. There is minimal advance warning of the crossing with a single sign and striping located 300 feet and 160 feet respectively to the north and south. There is a single overhead streetlight at the stop bar to the north and no overhead street lighting to the south. First Street has overhead street lighting at the two intersections north of the crossing and every 40 feet approaching C Street to the south and continuing into the downtown area. A single rail crossing arm with warning lights is installed in front of a stop bar on each approach and a second set of warning lights and crossing arms are installed on the other side of the road on each side of the tracks, creating a four-quadrant gated crossing. Sidewalks are located on both sides of the street, however there is significant brush and trees on the southeast corner which can block line of sight for northbound vehicles or pedestrians, as shown in Figure 4 below.

There was one recorded collision at the railroad crossing in the past 10 years, involving a pedestrian intentionally crossing the tracks in front of the train and being struck and killed.

FIGURE 4: SIGHT DISTANCE FROM SIDEWALK AT FIRST STREET RAIL CROSSING (LOOKING NORTHEAST)

B. INTERSECTION OF FIRST STREET AND EAST C STREET

The intersection of First Street and East C Street is a three-way minor-street (E C Street) stop-controlled intersection with a gated driveway creating a fourth approach. East C Street has a single lane of approach while First Street has a single through lane and a left-turn pocket in both directions. The intersection is located 215 feet south of the First Street crossing. There is a single overhead streetlight installed at the intersection and regular overhead street lighting along First Street.

There have been five crashes at this intersection in the past five years, four of which involved only property damage and the other one resulted in minor injuries. Two of the crashes were caused by unsafe speed and resulted in a rear-end crash, all of which resulted in minor injuries or property damage only. The majority of crashes occurred during the day in clear dry conditions.

On First Street between C Street and A Street there are several pedestrian generators, including an elementary school, park, and public library on the east side of First Street and the pedestrian undercrossing of the railroad at B Street on the west side of First Street. There are striped pedestrian crossings at B Street and C Street with pedestrian crosswalk signs[2] installed between the through lane and center turn lane. However, both crossings require crossing a three-lane section with parking on either side and no curb bulbous (approximately 55 feet). While the C Street crossing has a pedestrian activated flashing light and school crossing sign, the B Street crossing does not.

C. INTERSECTION OF NORTH ADAMS STREET/PORTER STREET AND WEST A STREET

The intersection of North Adams Street/Porter Street and West A Street is a signalized intersection with a through lane and left-turn pocket for all four approaches. The intersection is located 280 feet west of the West A Street crossing. There is full overhead street lighting installed at the intersection and sidewalks along both roads.

There have been six crashes at this or the previously described[3] intersection in the past five years, four of which only involved property damage only with the other two only resulting in minor injuries. The causes have a range of causes, only one of which was a rear-end crash and caused by following too closely. The majority of crashes occurred during the day in clear dry conditions.

D. INTERSECTION OF PORTER STREET AND WEST A STREET

The intersection of Porter Street and West A Street is a three-way minor-street (Porter Street) stop-controlled intersection with a single lane of approach in all directions and a two-way center turn lane. Porter Street has one-way travel at this location. The intersection is located just over 50

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[2] Manual on Uniform Traffic Control Devices R1-6

[3] The crash records do not distinguish between the two adjacent Porter Street intersections.

feet west of the East A Street crossing. There is one streetlight at the intersection, located halfway between Porter Street and the crossing, and sidewalks along West A Street.

E. RAILROAD CROSSING AT WEST A STREET

A Street runs east and west with a double rail crossing at an oblique angle as shown in Figure 3. There is minimal advance warning of the crossing with a single sign and striping located 200 feet and 140 feet respectively to the east and west. Streetlights are located at each stop bar along with signing and striping telling drivers not to stop on the tracks and to keep the area around the tracks clear. A single rail crossing arm with warning lights is installed in front of a stop bar on each approach and a second set of warning lights is installed on the other side of the road on each side of the tracks. The approach on both sides of the track is very steep from multiple repavings, as shown in Figure 5 below, and the sidewalk is limited near the crossing.

There were no recorded collisions at the railroad crossing in the past 10 years.

FIGURE 5: STEEP APPROACH AT EAST A STREET CROSSING

F. INTERSECTION OF JACKSON STREET AND WEST A STREET

The intersection of Jackson Street and East A Street is a minor-street (Jackson Street) stop-controlled intersection with a single lane of approach in all directions. The intersection is located 250 feet east of the E A Street crossing. There is full overhead street lighting installed at the intersection and sidewalks along both roads.

There have been eight crashes at this intersection in the past five years, seven of which involved property damage only with the other one only resulting in minor injuries. Most of the crashes were caused by improper turning, automobile right-of-way, or following too closely. The majority of crashes occurred in clear dry conditions. It is unlikely any of the crashes were related to rail crossing events.

G. INTERSECTION OF FIRST STREET AND EAST A STREET

The intersection of First Street and East A Street is a signalized intersection with a through lane and left-turn pocket for all four approaches. The intersection is located 925 feet south of the First Street crossing and 600 feet east of the E A Street crossing. There is full overhead street lighting installed at the intersection and sidewalks along both roads.

There have been eleven crashes at this intersection in the past five years, nine of which only involved property damage only with the other two only resulting in minor injuries. Three of the crashes were caused by unsafe speed or following too closely and resulted in a rear-end crash, all of which resulted in property damage only. The rear end crashes occurred during the day in clear dry conditions.

3. SOUTHWEST CROSSINGS AND NEARBY INTERSECTIONS

Figure 6 shows each of the rail crossings and nearby study intersections in the central area and summarizes constraints identified during the field visit. Each crossing and intersection are discussed in more detail below.

A. RAILROAD CROSSING AT PITT SCHOOL ROAD:

Pitt School Road runs north and south with a double rail crossing at an oblique angle as shown in Figure 6. There is minimal advance warning of the crossing with a single sign and striping located 650 feet and 440 feet respectively to the north and south with no overhead street lighting. A single rail crossing arm with warning lights is installed in front of a stop bar on each approach with an out of use arm installed from when the parallel Porter Road was previously striped to provide a direct approach across the tracks. The adjacent intersection of Pitt School Road and Porter Road is located less than 100 feet north of the crossing.

There was a single collision at the railroad crossing in the past 10 years, where an Amtrak train impacted a vehicle stopped on the tracks resulting in a fatality.

B. INTERSECTION OF PITT SCHOOL ROAD AND PORTER ROAD

The intersection of Pitt School Road and Porter Road is a skewed all-way stop-controlled intersection with a single lane of approach in all directions. The intersection is located 40 to 70 feet north of the Porter Road crossing. There is a single nearby overhead light installed along Porter, 50 feet west of the intersection. There has been significant striping installed recently the reduce the width of the travel lanes along all approaches, and to provide a channelized right-turn for northbound Porter Road vehicles turning onto Pitt School Road to cross the tracks. There were no recorded collisions at this intersection in the past 5 years.

FIGURE 6: SOUTHWEST RAIL CROSSINGS AND NEARBY INTERSECTIONS

SECTION C. TRAFFIC ANALYSIS MEMORANDUM

8950 CAL CENTER DRIVE, SUITE 340, SACRAMENTO, CA 95826 • 916.368.2000 • DKSASSOCIATES.COM

TECHNICAL MEMORANDUM

DATE: May 29, 2021

TO: Deborah Barr | City of Dixon

FROM: Erin Vaca, Kayla Fleskes, Bobby Sidhu | DKS Associates

SUBJECT: Dixon Rail Safety Traffic Study: Traffic Analysis Memorandum Project #20156

This memorandum summarizes the traffic operations and analysis of the existing and future conditions at seven study intersections and five at-grade rail crossings in the City of Dixon (illustrated in Figure 1). The findings from the following traffic analysis will help support the recommended solutions at each of the rail crossings and any potential intersection or roadway mitigations necessary to address operational and safety concerns at the surrounding study intersections.

EXISTING (YEAR 2019-2020) CONDITIONS ANALYSIS

Intersection turning movements for the study intersections were collected in April 2019, December 2020, and March 2021. Where 2019 turning movements were not available, daily roadway segment traffic counts from 2019 were used to factor the 2020 and 2021 turning movement counts to pre-COVID conditions due to travel pattern changes associated with the COVID-19 pandemic, as discussed in the *Data Collection and Methodology Memorandum*[1]. The factored traffic volumes used for analysis are shown in Figure 2. The traffic counts and spreadsheet showing adjustments to the traffic volumes are located in Appendix A.

[1] Data Collection and Methodology Memo – October 21, 2020

FIGURE 1. STUDY INTERSECTIONS AND RAILROAD CROSSING LOCATIONS

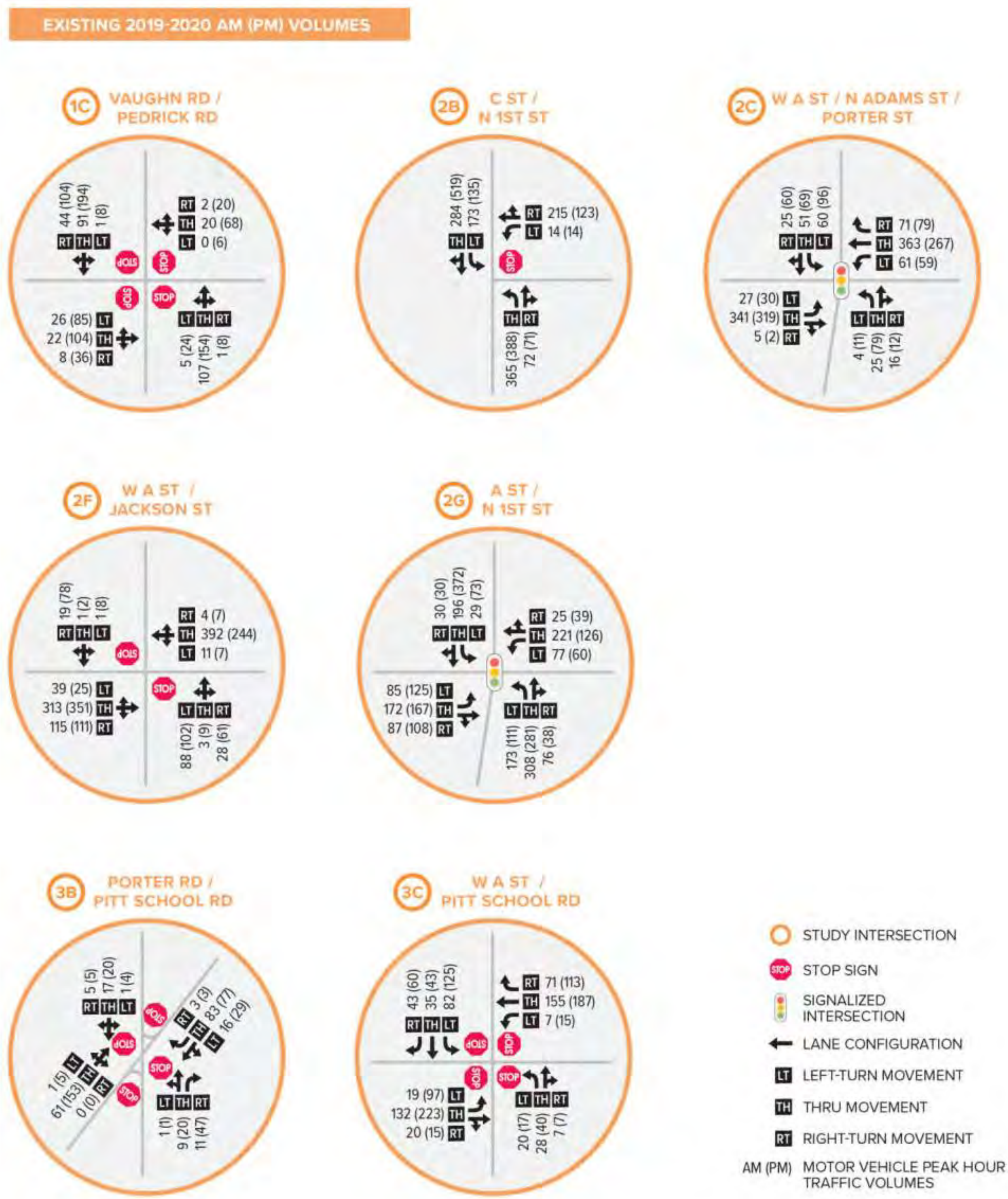


FIGURE 2. EXISTING (YEAR 2019-2020) INTERSECTION VOLUMES

Intersection operations were analyzed using Synchro software and the Highway Capacity Manual 6th Edition (HCM 6) methodologies. Performance measures used for this analysis include seconds of control delay and level of service (LOS). The City's mobility standard is LOS D. Table 1 lists the existing intersection operations results. The Synchro reports are located in Appendix B.

TABLE 1: EXISTING (YEAR 2019/2020) INTERSECTION OPERATIONS RESULTS

ID	INTERSECTION	TYPE	AM PEAK HOUR		PM PEAK HOUR	
			DELAY (S)	LOS	DELAY (S)	LOS
1C	PEDERICK RD / VAUGHN RD	AWSC	8	A	12	B
2B	FIRST ST / C ST	TWSC	5/18	A/C	3/17	A/C
2C	ADAMS ST / PORTER ST / A ST	Signal	13	B	14	B
2F	JACKSON ST / A ST	TWSC	5/32	A/D	7/32	A/D
2G	FIRST ST / A ST	Signal	18	B	19	B
3B	PITT SCHOOL RD / PORTER ST	AWSC	8	A	8	A
3C	PITT SCHOOL RD / A ST	Signal	10	A	13	B

Note: AWSC: All-way stop controlled intersection (average delay of intersection)
TWSC: Two-way stop-controlled intersection
LOS and delay for unsignalized intersection is reported for the (average delay/worst movement)
LOS and delay for signalized and all-way stop intersections are reported for the entire intersection

As shown in the table above, all study intersections operate within the City's LOS threshold. In the downtown area, the two-way stop controlled (TWSC) intersections of First Street/C Street and Jackson Street/A Street operate at or near the City standard, with the side street approaches experiencing LOS C and D conditions, respectively.

At First Street/C Street, there are minimal westbound left vehicles (approximately 14 vehicles during both the existing AM and PM peak hours) that experience LOS C conditions. The majority of traffic through the intersection experiences minimal delays.

The northbound approach at Jackson Street/A Street is approaching the LOS standard, operating at LOS D in the AM and PM peak hours. Jackson Street can serve as a bypass for First Street traffic with vehicles making a northbound left at Jackson Street/A Street (approximately 88 and 102 vehicles in AM and PM peak hours, respectively) to avoid traffic on First Street.

FUTURE (YEAR 2040) SCENARIO ANALYSIS

Three scenarios were analyzed to determine the traffic impacts of various combinations of rail crossing grade separation and roadway capacity improvements. Figure 3 summarizes the three scenarios, which include the following projects:

- **Baseline Scenario** - Includes network and land use assumptions consistent with analyses conducted for the most recent General Plan update, including the Vaughn Road realignment; the Parkway Boulevard overcrossing project; and widening segments of Pedrick Road, Vaughn Road, and Parkway Boulevard to four lanes; among other projects.

- **Scenario A** – Includes all the Baseline Scenario network assumptions (including widening of Pedrick Road, Vaughn Road and Parkway Boulevard) except for the Vaughn Road realignment and Parkway Boulevard overcrossing project.

- **Scenario B** – Includes all the Baseline Scenario network assumptions, including Vaughn Road realignment and Parkway Boulevard overcrossing project plus the A Street undercrossing and a closure of the at-grade railroad crossing at Pitt School Road (closure of the south leg of Pitt School Road at Porter Road). Note that the A Street undercrossing would imply closure of the connection between the east leg of Porter Street and A Street and thus have only minimal impacts to traffic patterns.

The following section discusses the traffic impacts of each of the three scenarios.

FIGURE 3. ROADWAY IMPROVEMENTS ASSUMED IN EACH FUTURE SCENARIO

FUTURE (YEAR 2040) TRAFFIC VOLUMES AND INTERSECTION OPERATIONS

Future (year 2040) motor vehicle volumes were forecast at the study intersections using the Dixon travel demand model, as developed for the General Plan 2040. The transportation network included the assumptions noted above for each of the three scenarios. In general, each of the three scenarios show peak hour traffic growth compared to the base year (year 2019). In the Baseline Scenario, peak hour growth ranges from approximately 13% on A Street to 15% on First Street between 2019 and 2040.

Figures 4A and 4B show the approximate shift in peak hour traffic expected with Scenario A and Scenario B (relative to the Baseline Scenario). The following summarizes the major traffic shifts expected with each scenario:

- **Scenario A**: As shown in Figure 4A, motor vehicle volume shifts are relatively localized with the Vaughn Road realignment. Without the Parkway Boulevard overcrossing, more traffic uses First Street and Midway Road, with fewer vehicles traveling on Pitt School Road.
- **Scenario B**: As shown in Figure 4B, with the closure of the south leg of Pitt School Road at Porter Road, fewer vehicles travel along Pitt School Road, with people diverting to Midway Road to access Porter Road (approximately 25-50 vehicles) or to First Street to access the Parkway Boulevard overcrossing. There is also a slight shift in motor vehicle volume due to the A Street undercrossing, which closes northbound right turn access at Porter Road/A Street, shifting slightly more northbound right turn traffic to Porter Road/Adams Street/A Street.

Based on these three scenarios, future (year 2040) peak hour traffic volumes were forecast at the study intersections using the Dixon travel demand model. Traffic volumes at each study intersection were forecast and post-processed using industry standard[2] procedures for each of the three future scenarios. Future intersection operations were analyzed for each scenario using the post-processed future traffic volumes and HCM 6 methodologies. Appendix C includes a table summarizing the intersection operations results for each scenario.

The following section discusses the key results for each railroad crossing study area, including the Northeast area, Central area and Southwest area of Dixon.

[2] National Cooperative Highway Research Program (NCHRP) Report 765: *Analytical Forecasting Approaches for Project-Level Planning and Design.*

FIGURE 4A. SCENARIO A: SHIFT IN PEAK HOUR MOTOR VEHICLE VOLUMES COMPARED TO BASELINE

FIGURE 4B. SCENARIO B: SHIFT IN PEAK HOUR MOTOR VEHICLE VOLUMES COMPARED TO BASELINE

KEY TRAFFIC FINDINGS BY AREA

The following sections summarize the impacts of each project on adjacent study intersections.

NORTHEAST AREA TRAFFIC FINDINGS

The northeast area of the study intersections includes Vaughn Road and Pedrick Road.

VAUGHN ROAD REALIGNMENT

With the realignment of Vaughn Road, a new three-legged intersection of Vaughn Road (proposed) / Pedrick Road is created to the north of the existing intersection. While Pedrick Road has been previously planned as a future four-lane roadway, a three-lane configuration was tested for this analysis (single lane in each direction with left turn bays). With this configuration, two-way stop-controlled intersections operate well within the City's mobility thresholds, as shown below in Table 2. A roundabout intersection design was also tested as an option for the new Vaughn Road (proposed) / Pedrick Road intersection associated with the realignment.

TABLE 2: FUTURE (2040) INTERSECTION OPERATIONS IN THE NORTHEAST AREA

ID	INTERSECTION	CONFIGURATION/ SCENARIO	TYPE	2040 AM PEAK HOUR		2040 PM PEAK HOUR	
				DELAY (S)	LOS	DELAY (S)	LOS
1C	VAUHGN RD (EXISTING) / PEDRICK RD*	Without realignment (Scenario A)	AWSC	9	A	15	C
		With realignment (Scenario B)	TWSC	1/10	A/A	3/12	A/B
1D	VAUHGN RD (PROPOSED) / PEDRICK RD	With realignment (Baseline Scenario)	TWSC, with NBL and SBR turn lanes	2/11	A/B	4/18	A/C
			Roundabout	4	A	5	A

Note: AWSC: All-way stop controlled intersection (average delay of intersection)
TWSC: Two-way stop-controlled intersection
Roundabout (average delay of intersection)
LOS and delay for TWSC intersection reported for the (average delay/worst movement)
LOS and delay for signalized and AWSC intersections reported for the entire intersection
* Vaughn Rd (existing) / Pedrick Rd: Westbound approach reported as worst movement.
Minimal volumes were assumed for the eastbound leg at Vaughn Road (existing)/Pedrick Road to provide driveway access to the property in the northwest corner of the intersection.

Vaughn Road (existing) / Pedrick Road and Vaughn Road (proposed) / Pedrick Road are expected to operate at acceptable conditions in all future scenarios. Due to safety concerns and high speeds along Pedrick Road, turn pockets are recommended for the southbound right movement and northbound left movement at Vaughn Road (proposed) / Pedrick Road. In addition, as the area becomes more developed and urban in nature, a reduction in the posted speed limit should be considered on Pedrick Road.

Based on the volume distribution when Vaughn Road is realigned, the intersection may be converted to two-way stop-controlled to reduce delays along Pedrick Road. However, given that Vaughn Road / Pedrick Road is an all-way stop-controlled intersection today, and it likely meets the minimum volume threshold for multi-way stop warrant with the future realignment, AWSC could be considered a potential solution. All-way stop-control at Vaughn Road (existing) / Pedrick Road and Vaughn Road (proposed) / Pedrick Road are expected to operate within the City's standards.

Additionally, converting Vaughn Road (proposed) / Pedrick Road to a roundabout may improve safety. This alternative would require higher capital costs to construct a large single lane roundabout. The roundabout would need to be designed to accommodate multi axle truck, trailer and farm equipment which routinely utilize Pedrick Road and Vaughn Road. The roundabout alternative is also expected to operate within the City's standards.

CENTRAL AREA TRAFFIC FINDINGS

There are limited traffic impacts anticipated within the central area study intersections associated with the major projects included in the three scenarios. With the A Street Undercrossing, the intersection of Porter Street / A Street (northbound right turn only) would be closed. While this would slightly increase northbound right turns at A Street / Porter Street / Adams Street, it is anticipated that the intersection would continue to operate well in the future (delay less than 16 seconds for all three scenarios).

With or without the major projects identified in the three scenarios, the TWSC intersection at Jackson Street / A Street is expected to operate poorly in the future, with side-street delays at LOS F. Potential solutions are discussed below.

JACKSON STREET / A STREET

With the increase in traffic volumes due to future growth and major projects in Dixon, the northbound approach at Jackson Street / A Street is expected to operate at LOS F regardless of scenario. To address the future operational deficiencies at this location, the following potential solutions were evaluated:

- Restrict northbound left turns (adding signage to close the northbound left turn except for emergency vehicles). To improve compliance with turn restrictions, a mountable median (traversable by emergency vehicles) could also be installed at the northbound approach. To travel west on A Street, motorists would instead make a northbound left turn at the signal at the First Street / A Street intersection.
- Convert the intersection to all-way stop-control.
- Convert the intersection to a traffic signal.

Table 3 lists the intersection operations results for each of these options. Given that restricting northbound left turns at Jackson Street / A Street would increase northbound left turns at First Street / A Street, intersection operations are also reported in Table 3 for First Street / A Street, both with and without a northbound left turn restriction at Jackson Street / A Street.

TABLE 3: FUTURE (2040) INTERSECTION OPERATIONS IN THE CENTRAL AREA

ID	INTERSECTION	TYPE	2040 AM PEAK HOUR		2040 PM PEAK HOUR	
			DELAY (S)	LOS	DELAY (S)	LOS
2F	JACKSON ST / A ST	TWSC	12/**103**	B/**F**	20/**122**	A/**F**
		TWSC (with NBL turn restriction)	1/12	A/B	3/16	A/C
		AWSC	31	D	**49**	**E**
		Signal	32	C	14	B
2G	FIRST ST / A ST*	Signal	21	C	23	C
		Signal (with NBL turn restriction at Jackson St/A St)	26	C	29	C

Note: **Bold and red** indicates exceeding City mobility standards
AWSC: All-way stop controlled intersection (average delay of intersection)
TWSC: Two-way stop-controlled intersection
LOS and delay for unsignalized intersection is reported for the (average delay/worst movement)
LOS and delay for signalized and all-way stop intersections are reported for the entire intersection
Scenario A reported due to worst/highest delay for both intersections

Based on the intersection operation results, restricting northbound left turns would improve side street delay at Jackson Street / A Street without significantly increasing delay at First Street / A Street (LOS C regardless of turn restrictions at Jackson Street / A Street). However, additional left turn storage may be required at First Street / A Street to ensure the northbound left turn queue does not spillback into the through lane. This could be accomplished without roadway widening by adding parking restrictions on one side of First Street between A Street and Mayes Street, south of the existing left turn lane (approximately 5 existing on-street parking spaces). In addition, signage restricting northbound left turns could be paired with traffic calming measures on Jackson Street to make it a less attractive cut-through alternative to First Street.

Given the relatively high volumes at Jackson Street / A Street, an all-way stop-controlled intersection would exceed City LOS standards as shown in Table 3 above. With the Parkway Boulevard overcrossing in place, an all-way stop-controlled intersection at Jackson Street / A Street would operate slightly better (LOS D in the PM peak hour under the Baseline Scenario) but given the proximity to the A Street railroad crossing, an all-way stop-controlled intersection could potentially cause eastbound queues on A Street to spill back to the railroad crossing, presenting a safety concern. While a signalized intersection may improve intersection delay, it is unlikely that a traffic signal would be feasible at this location given the close spacing with the traffic signal at First Street / A Street and the possibility of queue spillback between the two signals. Therefore, it is recommended that northbound left turn restrictions be placed at Jackson Street / A Street with signage. To enhance compliance with the left turn restrictions at the intersection, right turn channelization could be added using a mountable curb design (traversable by emergency vehicles).

SOUTHEAST AREA TRAFFIC FINDINGS

The southeast area of the project includes Pitt School Road / Porter Road, Pitt School Road / Parkway Boulevard (future intersection), Parkway Boulevard / First Street and Valley Glen Drive / First Street intersections.

PITT SCHOOL ROAD CLOSURE

Pitt School Road / Porter Road is currently an all-way stop-controlled intersection, with an at-grade railroad crossing located approximately 100 feet south of the intersection. Closing the south leg of Pitt School Road would remove the at-grade railroad crossing at Pitt School Road. There is limited traffic utilizing the south leg of Pitt School Road today (fewer than 70 northbound and 50 southbound vehicles during the PM peak hour) and as discussed above, limited diversion is expected from the closure. With the closure of the south leg of Pitt School Road at Porter Road, the intersection is expected to continue to operate well with the existing intersection control, experiencing limited delays. With the closure, two-way stop-control on the north leg of Pitt School Road could also be considered and would operate similarly to the all-way stop control intersection, as shown below in Table 5.

TABLE 4: FUTURE (2040) INTERSECTION OPERATIONS AT PITT SCHOOL ROAD / PORTER ROAD

ID	INTERSECTION	SCENARIO	TYPE	2040 AM PEAK HOUR		2040 PM PEAK HOUR	
				DELAY (S)	LOS	DELAY (S)	LOS
3B	PITT SCHOOL RD / PORTER RD	Without Pitt School Rd Railroad Crossing Closure (Baseline Scenario)	AWSC	8	A	9	A
		With Pitt School Rd Railroad Crossing Closure (Scenario B)	AWSC	8	A	8	A
			TWSC with EBL turn lane	3/9	A/A	2/9	A/A

Note: AWSC: All-way stop controlled intersection (average delay of intersection)
TWSC: Two-way stop-controlled intersection
LOS and delay for unsignalized intersection is reported for the (average delay/worst movement)
LOS and delay for signalized and all-way stop intersections are reported for the entire intersection

If conversion to two-way stop-controlled was considered at the intersection with a closure of the Pitt School Road railroad crossing, a turn pocket is recommended for the eastbound left movement due to the high speeds along Porter Road. Given the width of the existing pavement on the eastbound leg of the intersection (approximately 50 feet), there is likely enough space to re-stripe the lanes to accommodate a short eastbound left turn pocket. Conversion to TWSC is expected to avoid unnecessary delays along Porter Road. Two-way stop-control will operate within the City's standards.

This intersection is unlikely to meet the minimum volume threshold for multi-way stop warrant with the future realignment; however, given that Pitt School Road / Porter Road is an AWSC intersection today, AWSC could be the potential solution. AWSC is expected to operate within the City's standards as well.

PARKWAY BOULEVARD OVERCROSSING

The Parkway Boulevard overcrossing is expected to draw approximately 5,000 vehicles per day (approximately 475 total vehicles during both the AM and PM peak hours). While more vehicles will travel on Pitt School Road and fewer on A Street with the overcrossing in place, the impact at A Street / Pitt School Road is relatively minor and similar levels of delay (average delay less than 24 seconds in PM peak hour) are experienced at this intersection with or without the Parkway Boulevard overcrossing. Similarly, the intersection of Pitt School Road / Porter Road will operate well regardless of whether the Parkway Boulevard overcrossing project is in place.

To help understand the localized impacts of the Parkway Boulevard overcrossing, three additional intersections were analyzed under 2040 conditions:

- Pitt School Road / Parkway Boulevard (4A)

- Parkway Boulevard / First Street (4B)
- Valley Glen Drive / First Street (4C)

The additional study intersections are illustrated in Figure 5.

FIGURE 5. PARKWAY BLVD STUDY INTERSECTIONS

Regardless of whether the south leg of Pitt School Road is closed (which results in fewer vehicles on Pitt School Road and more vehicles using the overcrossing), the intersection of Pitt School Road / Parkway Boulevard is expected to operate well as an all-way stop-controlled intersection with single lane approaches with a southbound left, westbound left, and northbound right turn pocket. Table 6 below lists the recommended traffic control and shows the intersection operation results at the three additional study intersections.

TABLE 5: FUTURE (2040) INTERSECTION OPERATIONS IN THE SOUTHWEST AREA

ID	INTERSECTION	INTERSECTION CONTROL / SCENARIO	2040 AM PEAK HOUR		2040 PM PEAK HOUR	
			DELAY (S)	LOS	DELAY (S)	LOS
4A	PITT SCHOOL RD / PARKWAY BLVD	AWSC	10	A	10	A
4B	PARKWAY BLVD / FIRST STREET	Signal	15	B	15	B
4C	VALLEY GLEN DR / FIRST STREET	Signal	22	C	13	B

Note: AWSC: All-way stop controlled intersection (average delay of intersection)
TWSC: Two-way stop-controlled intersection
LOS and delay for unsignalized intersection is reported for the (average delay/worst movement)
LOS and delay for signalized and all-way stop intersections are reported for the entire intersection
Scenario B reported due to worst/highest delay for all three intersections
The above intersections were added to determine the impact of the Parkway Blvd overcrossing project

Limited levels of delay (average delay less than 20 seconds for the eastbound left movement in the PM peak hour) are experienced at Pitt School Road/Parkway Boulevard. The impact of the overcrossing at Parkway Boulevard / First Street is relatively minor, with the traffic signal operating at LOS B. In addition, the intersection of Valley Glen Drive / First Street will operate well regardless of whether the Parkway Boulevard overcrossing project is in place. Additional analysis is currently underway as part of the redesign of the Parkway Boulevard overcrossing to help determine an appropriate cross section for the overcrossing.

ANALYSIS OF PLANNED ROADWAY GEOMETRY

Two areas of significant growth in the future in Dixon are the Northeast Quadrant Specific Plan and Southwest Dixon Specific Plan areas. Given the growth in volume and the proximity to the railroad crossings, the future street network was screened using the methodology developed for the Streets Master Plan Update[3]. Appendix E shows the LOS screening maps for each of the three scenarios and the base year traffic model.

Based on the high-level LOS screening, all roadway segments in the Northeast Quadrant and Southwest areas operate at the City standard (LOS D) or better. As discussed in more detail in the Streets Master Plan update, while specific roadway segments are operating well (indicating that roadway widening is not necessary), specific intersections may need to be widened to add turn lanes or modified with other capacity improvements in the future. Based on the future traffic demand shown in the model, the following locations are areas where additional improvements may be warranted. To determine which specific intersection improvements may be needed in the future

[4] Dixon Streets Master Plan: Proposed LOS Methodology Memo – January 21, 2021

(if any), it is recommended that intersection-level analysis be conducted at the locations listed below, particularly as development progresses in each of the areas.

In addition to motor vehicle capacity improvements, the Dixon General Plan 2040 designates a "complete streets" approach to roadway improvements to safely accommodate all modes of travel for users of all ages and abilities. To help create "complete streets" in Dixon, the General Plan identifies an extensive network of proposed pedestrian and bicycle facilities. In the Northwest Quadrant and Southwest Area, streets and intersections should be designed in a way that is consistent with "complete streets" principles and with the proposed multiuse facilities identified in the General Plan. In particular, where collector and arterial roadways intersect, specific safety considerations should be made to maintain low-stress facilities for people walking and biking, consistent with the bicycle facility designation in the General Plan.

NORTHWEST QUADRANT

New roadways assumed in the Northwest Quadrant Area (from the Northwest Quadrant Specific Plan) are shown below in Figure 6.

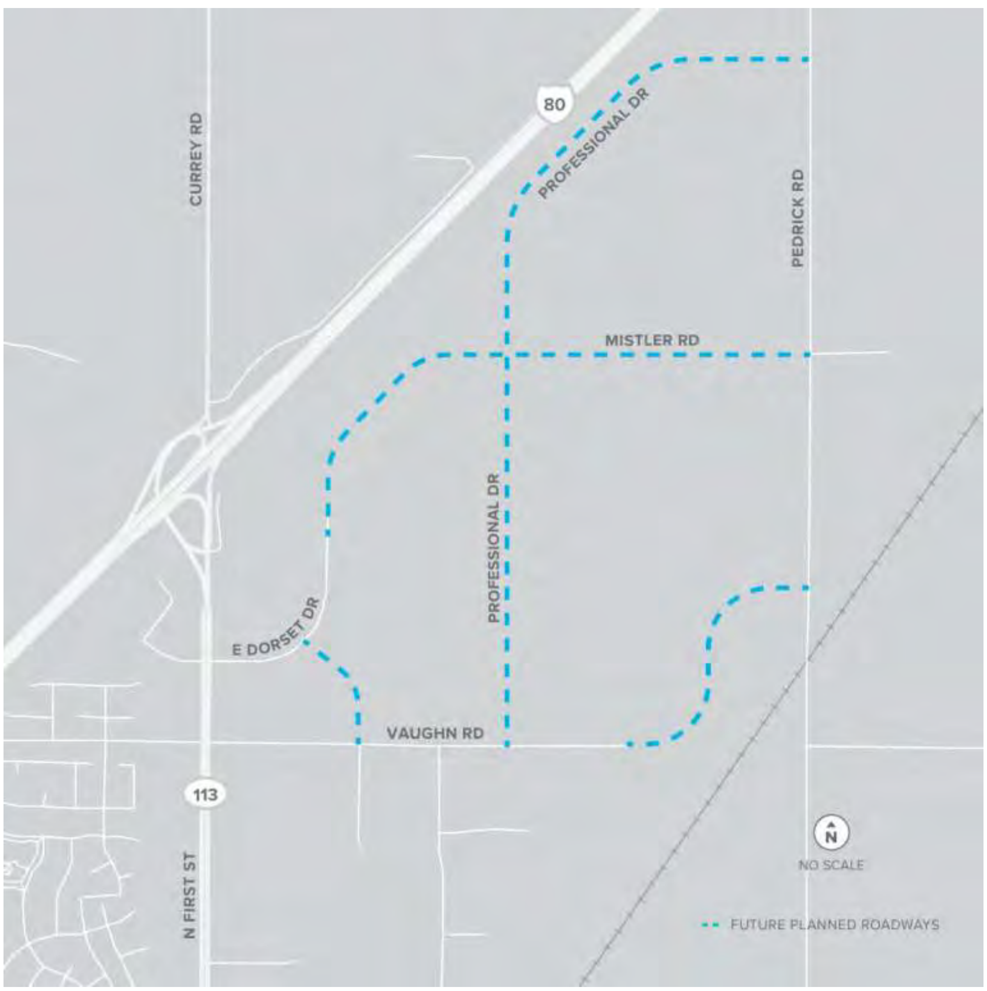


FIGURE 6. NORTHWEST QUADRANT ROADWAYS

The following lists considerations that should be taken at certain intersections:

- Mistler Road / Pedrick Road
  - Given the higher speeds on Pedrick Road and the traffic demand forecast on Mistler Road, additional improvements (including northbound left turn lanes on Pedrick Road) may be warranted at this intersection. Similar to the intersection of Vaughn Road and Pedrick Road, an all-way stop controlled intersection, two-way stop-controlled intersection or roundabout could be considered at this location. As the area becomes more developed and less rural in nature, a reduction in the posted speed limit on Pedrick Road should also be considered to reduce the risk of severe and fatal injury crashes.
- Professional Drive and Mistler Road
  - Based on the model, it is likely that single lane approaches could accommodate the anticipated traffic demand on Professional Drive and Mistler Road (particularly east of Professional Drive and north of Mistler Road) but right-of-way should be maintained for a three-lane cross section. At key intersections, such as Professional Drive / Mistler Road, traffic volumes should be monitored as development occurs to determine if additional turn lanes may be needed at intersections.
- Dorset Drive
  - Dorset Drive is currently a five-lane roadway that narrows to three-lanes at the terminus. Depending on the scale of development that occurs between Dorset Drive and Professional Drive, Dorset Drive should be extended as a three-lane section with right-of-way reserved for a five-lane roadway if needed.

SOUTHWEST AREA

New roadways assumed in the Southwest Area (from the Southwest Dixon Plan) are shown below in Figure 7 (see page 18 below). The following lists considerations that should be taken for roadways in the Southwest Area:

- A Street
  - While A Street was not flagged for additional roadway widening, as development occurs south of A Street, it is likely that additional intersection control (i.e., traffic signals) may be warranted at some of the major intersections (such as Pitt School Road, Evans Road or Gateway Drive) and would be added by developers in the future.
  - In particular, while A Street/Pitt School Road operates at LOS C as an all-way stop controlled intersection, given the large cross section (multiple approaches with three lanes), signalization should be considered to help improve safety overall and safety and accessibility for people walking and biking, consistent with the City's "complete streets" policy.
  - Additionally, access management techniques (e.g., consolidating driveways, restricting driveway access to right-in, right-out access only, etc.) should be considered on A Street to reduce vehicular conflicts from driveways and ensure more efficient flow along A Street.

- I-80/A Street Interchange
  - The Southwest Dixon Specific Plan identifies an interchange improvement at eastbound I-80 ramps/A Street/Batavia Road and shows North Parkway Boulevard connecting directly to the interchange. It is likely that the configuration shown in the Southwest Dixon Specific Plan would require rebuilding the interchange to ensure that the new intersection with North Parkway Boulevard would not cause motor vehicle queues to spillback onto the I-80 mainline. In addition, access at North Parkway Blvd (or Batavia Road) would need to be well managed to ensure safe and efficient I-80 ramp, intersection, and roadway operations.
  - A new signal has been planned by Caltrans at the eastbound I-80 off ramp/A Street. Given the close spacing of the I-80 northbound ramps and Gateway Drive on A Street, future traffic signals at the two intersections should be coordinated to maintain safe and efficient operations of the ramp and intersection and access along A Street should be well managed. Pedestrian and bicycle upgrades should also be considered in the interchange area to ensure A Street is consistent with the City's "complete streets" policy in the General Plan 2040.
- Parkway Boulevard
  - Parkway Boulevard is planned to extend over the railroad and through the Southwest Area of Dixon. As discussed in the Southeast Area Traffic Findings above, intersection widening is not needed over the 20-year planning horizon. However, "complete streets" principles should be incorporated into the design of the overcrossing and the street cross section, particularly as the overcrossing will serve as a key route between the expanding households in the Southwest Area and the high school east of First Street.

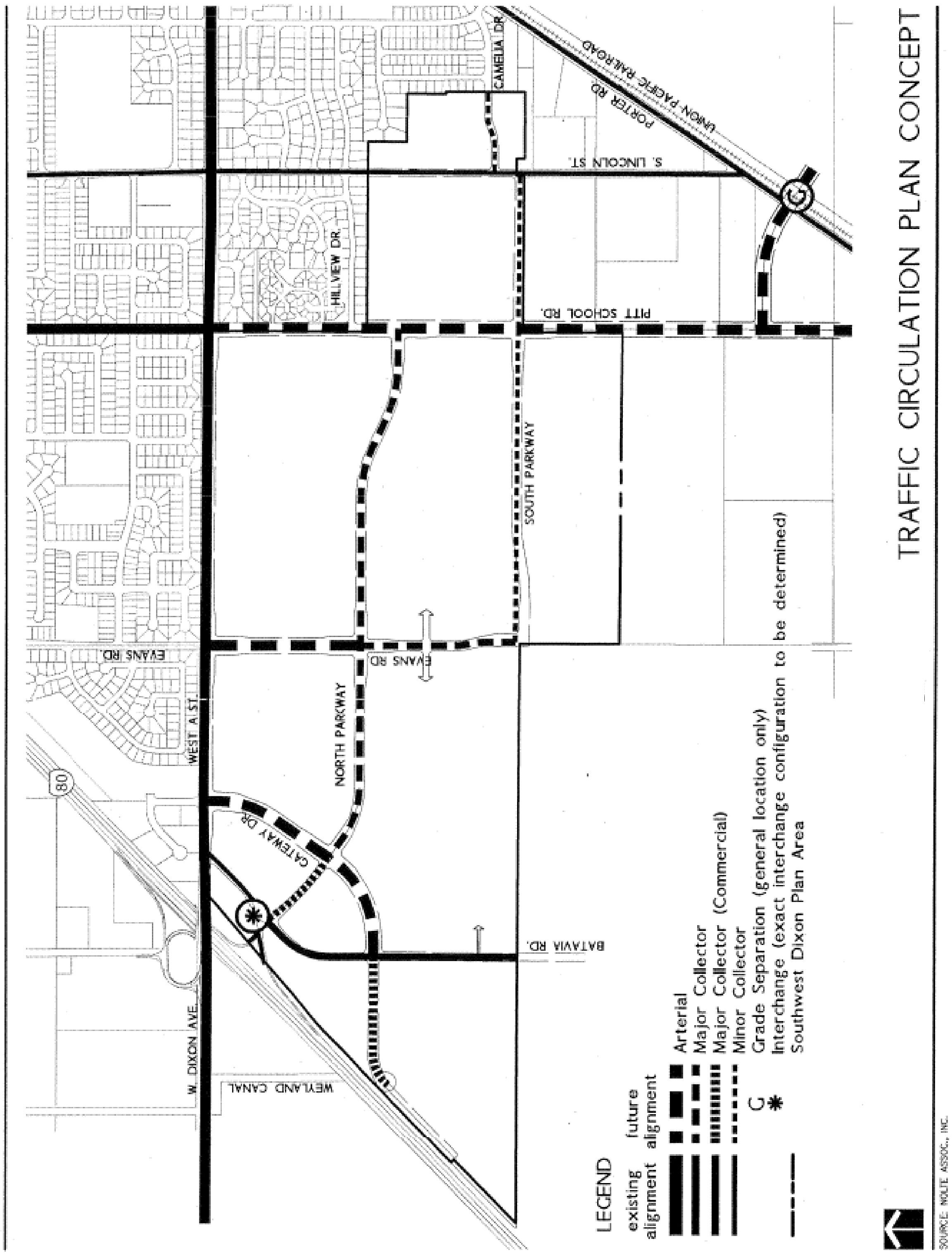


FIGURE 7. SOUTHWEST DIXON ROADWAYS

Source: Southwest Dixon Specific Plan, August 2005, Figure 6.1

APPENDIX A – TRAFFIC COUNTS & SPREADSHEET TO SCALE COVID VOLUMES

Prepared by National Data & Surveying Services

Pitt School Rd & W A St

Peak Hour Turning Movement Count

ID: 21-070024-001
City: Dixon

Day: Tuesday
Date: 03/02/2021

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

CONTROL: 4-Way Stop

	AM	NOON	PM
TEV	534	0	850
PHF	0.91		0.92

Pitt School Rd — SOUTHBOUND

	Right	Through	Left	U-Turn	Outbound
AM	33	34	62	0	104
NOON	0	0	0	0	0
PM	54	39	113	0	226
Bikes	0	0	0	0	

Pitt School Rd — NORTHBOUND

	Outbound	U-Turn	Left	Through	Right
PM	66	0	16	38	7
NOON	0	0	0	0	0
AM	59	0	15	27	5
Bikes		0	0	0	0

W A St — EASTBOUND

	AM	NOON	PM	Bikes
Outbound	176	0	230	
U-Turn	0	0	0	0
Left	18	0	91	0
Through	128	0	208	0
Right	19	0	14	0

W A St — WESTBOUND

	Bikes	PM	NOON	AM
Right	0	97	0	59
Through	0	160	0	128
Left	0	13	0	6
U-Turn	0	0	0	0
Outbound		328	0	195

Total Vehicles (AM)

Southbound: 33 (right), 34 (through), 62 (left)
Eastbound: 18 (left), 128 (through), 19 (right)
Westbound: 59 (right), 128 (through), 6 (left)
Northbound: 15 (left), 27 (through), 5 (right)

Total Vehicles (Noon)

All movements: N/A

Total Vehicles (PM)

Southbound: 54 (right), 39 (through), 113 (left)
Eastbound: 91 (left), 208 (through), 14 (right)
Westbound: 97 (right), 160 (through), 13 (left)
Northbound: 16 (left), 38 (through), 7 (right)

Bikes (AM)

Southbound: 0, 0, 0
Eastbound: 1 (left), 0 (through), 0 (right)
Westbound: 0 (right), 0 (through), 0 (left)
Northbound: 0, 0, 0

Bikes (NOON)

All movements: N/A

Bikes (PM)

Southbound: 1 (right), 3 (through), 0 (left)
Eastbound: 0 (left), 0 (through), 0 (right)
Westbound: 0 (right), 1 (through), 1 (left)
Northbound: 0 (left), 1 (through), 0 (right)

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	→	3	0	1
North	←	2	0	2
South	→	0	0	0
South	←	1	0	1
West	↓	0	0	1
West	↑	0	0	0
East	↓	2	0	0
East	↑	0	0	2
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Prepared by National Data & Surveying Services

1st St & C St

Peak Hour Turning Movement Count

ID: 19-07141-004
City: Dixon

Day: Tuesday
Date: 04/16/2019

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

1st St — SOUTHBOUND

AM	3	284	173	0	580
NOON	0	0	0	0	0
PM	0	519	135	0	512
	0	0	0	0	

C St — EASTBOUND

AM	NOON	PM	
3	0	0	
0	0	0	0
0	0	1	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

C St — WESTBOUND

	PM	NOON	AM
0	123	0	215
0	0	0	0
0	14	0	14
0	0	0	0
	206	0	245
	PM	NOON	AM

CONTROL

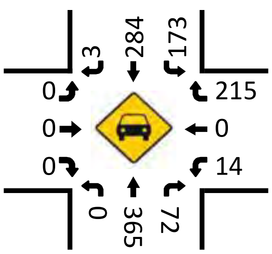
0

	AM	NOON	PM
TEV	1126	0	1251
PHF	0.75		0.95

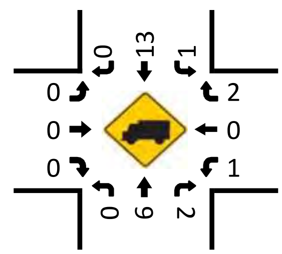
1st St — NORTHBOUND

		0	0	0	0
PM	533	0	0	388	71
NOON	0	0	0	0	0
AM	298	0	0	365	72

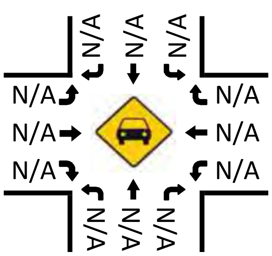
Total Vehicles (AM)



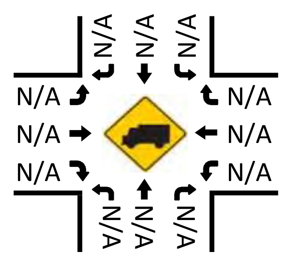
HT (AM)



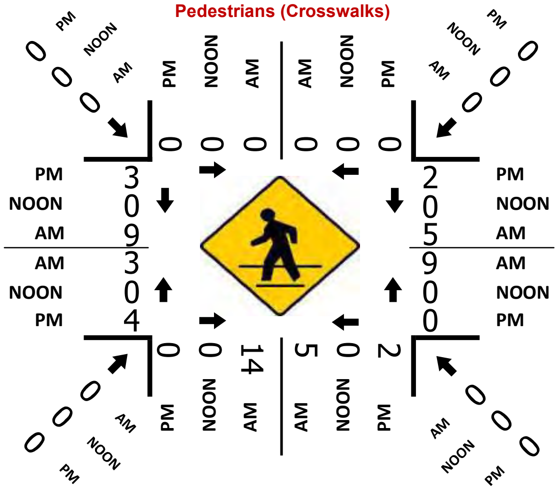
Total Vehicles (Noon)



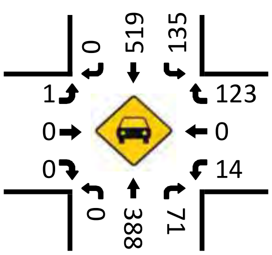
HT (NOON)



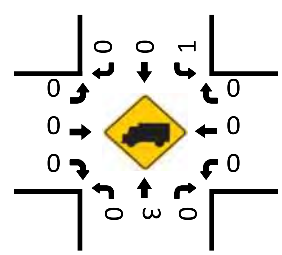
Pedestrians (Crosswalks)



Total Vehicles (PM)



HT (PM)



Prepared by National Data & Surveying Services

1st St & A St

Peak Hour Turning Movement Count

ID: 19-07141-007
City: Dixon

Day: Tuesday
Date: 04/16/2019

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM

1st St — SOUTHBOUND

	Right	Thru	Left	U-Turn	Total (NB departing)
AM	30	196	29	0	418
NOON	0	0	0	0	0
PM	30	372	73	0	445
	0	0	0	0	

A St — EASTBOUND

	AM	NOON	PM	
Departing (WB)	424	0	267	
U-Turn	0	0	0	0
Left	85	0	125	0
Thru	172	0	167	0
Right	87	0	108	0

A St — WESTBOUND

	PM	NOON	AM
0 Right	39	0	25
0 Thru	126	0	221
0 Left	60	0	77
0 U-Turn	0	0	0
Departing (EB)	278	0	277

1st St — NORTHBOUND

	Departing (SB)	U-Turn	Left	Thru	Right
		0	0	0	0
PM	540	0	111	281	38
NOON	0	0	0	0	0
AM	360	0	173	308	76

CONTROL

0

	AM	NOON	PM
TEV	1479	0	1530
PHF	0.83		0.98

Total Vehicles (AM)

SB: 30 / 196 / 29; WB: 25 / 221 / 77; NB: 173 / 308 / 76; EB: 85 / 172 / 87

HT (AM)

SB: 1 / 12 / 1; WB: 0 / 2 / 1; NB: 2 / 10 / 0; EB: 1 / 2 / 2

Total Vehicles (Noon)

All movements: N/A

HT (NOON)

All movements: N/A

Total Vehicles (PM)

SB: 30 / 372 / 73; WB: 39 / 126 / 60; NB: 111 / 281 / 38; EB: 125 / 167 / 108

HT (PM)

SB: 0 / 0 / 0; WB: 0 / 1 / 0; NB: 0 / 3 / 1; EB: 0 / 1 / 0

Pedestrians (Crosswalks)

Crosswalk		AM	NOON	PM
North	left	0	0	0
North	right	3	0	3
West	upper	0	0	16
West	lower	2	0	8
East	upper	0	0	2
East	lower	0	0	2
South	left	1	0	8
South	right	3	0	28
Corners (each)		0	0	0

Prepared by National Data & Surveying Services

SR 113 & Valley Glen Dr/Heritage Ln

Peak Hour Turning Movement Count

ID: 19-07141-009
City: Dixon

Day: Tuesday
Date: 04/16/2019

PEAK HOURS	COUNT PERIODS
AM: 07:15 AM - 08:15 AM	AM: 07:00 AM - 09:00 AM
NOON: NONE	NOON: NONE
PM: 04:30 PM - 05:30 PM	PM: 04:00 PM - 06:00 PM

SR 113 — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	28	236	13	0	352
NOON	0	0	0	0	0
PM	103	179	26	0	342
Crosswalk/Other	0	0	0	0	

Valley Glen Dr/Heritage Ln — EASTBOUND

	AM	NOON	PM	
Departing	48	0	182	
U-Turn	0	0	1	0
Left	104	0	71	0
Through	0	0	1	0
Right	88	0	37	0

Valley Glen Dr/Heritage Ln — WESTBOUND

		PM	NOON	AM
Right	0	14	0	37
Through	0	0	0	2
Left	0	6	0	10
U-Turn	0	0	0	0
Departing		45	0	19

CONTROL

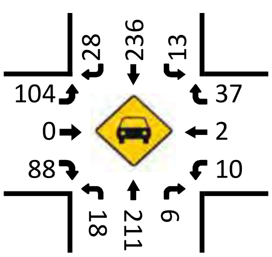
0

	AM	NOON	PM
TEV	753	0	791
PHF	0.80		0.96

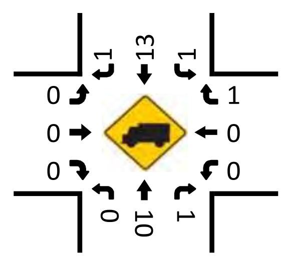
SR 113 — NORTHBOUND

	Departing	U-Turn	Left	Through	Right
		0	0	0	0
PM	222	0	78	257	18
NOON	0	0	0	0	0
AM	334	0	18	211	6

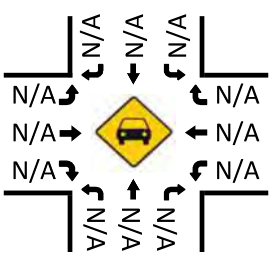
Total Vehicles (AM)



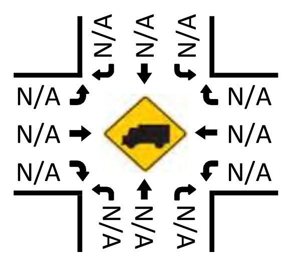
HT (AM)



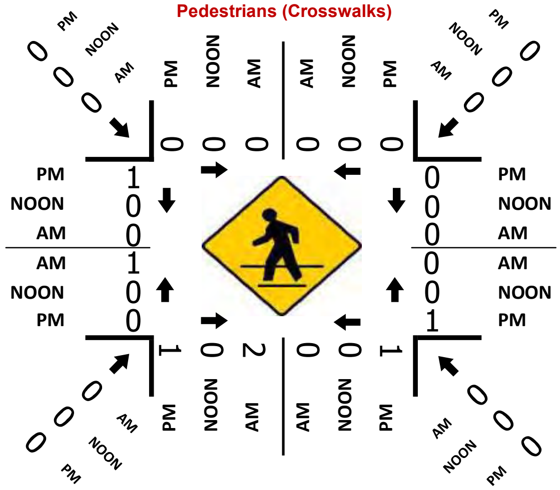
Total Vehicles (Noon)



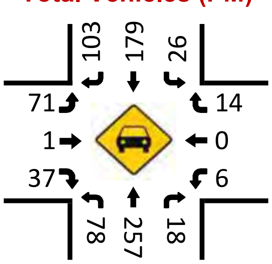
HT (NOON)



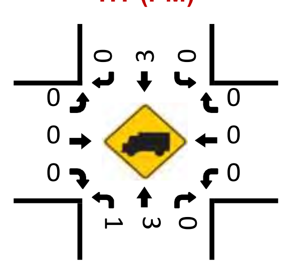
Pedestrians (Crosswalks)



Total Vehicles (PM)



HT (PM)



Prepared by National Data & Surveying Services

SR 113 & Parkway Blvd

Peak Hour Turning Movement Count

ID: 19-07141-010
City: Dixon

Day: Tuesday
Date: 04/16/2019

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

SR 113 – SOUTHBOUND

	Right	Thru	Left	U-Turn	Exit
AM	12	178	147	0	240
NOON	0	0	0	0	0
PM	19	139	65	0	356
Bikes	0	0	0	0	

Parkway Blvd – EASTBOUND

	AM	NOON	PM	Bikes
Exit	19	0	34	
U-Turn	0	0	0	0
Left	31	0	20	0
Thru	5	0	0	0
Right	25	0	12	0

Parkway Blvd – WESTBOUND

	PM	NOON	AM	Bikes
Right	82	0	84	0
Thru	0	0	3	0
Left	26	0	40	0
U-Turn	0	0	0	0
Exit	98	0	208	

SR 113 – NORTHBOUND

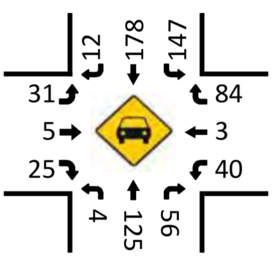
	Exit	U-Turn	Left	Thru	Right
Bikes		0	0	0	0
PM	177	0	15	254	33
NOON	0	0	0	0	0
AM	243	0	4	125	56

CONTROL

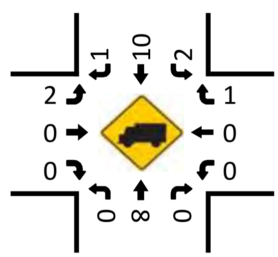
0

	AM	NOON	PM
TEV	710	0	665
PHF	0.71		0.96

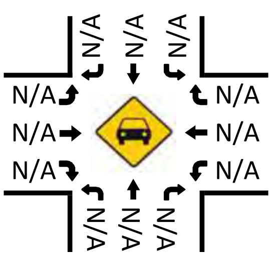
Total Vehicles (AM)



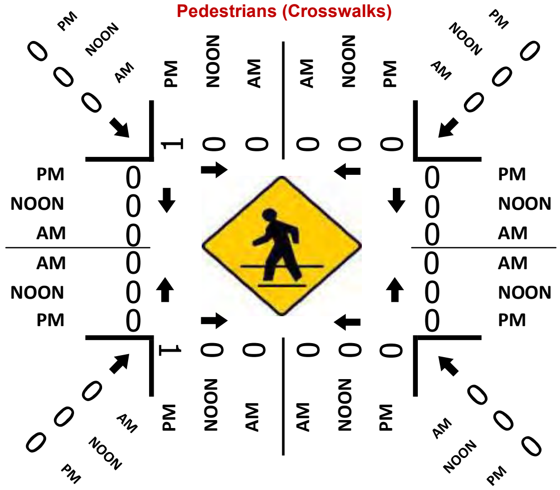
HT (AM)



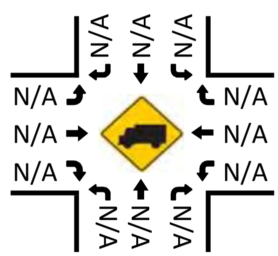
Total Vehicles (Noon)



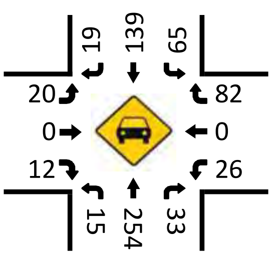
Pedestrians (Crosswalks)



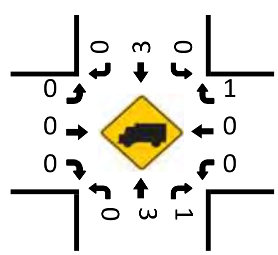
HT (NOON)



Total Vehicles (PM)



HT (PM)



Prepared by National Data & Surveying Services

Porter St & A St

Peak Hour Turning Movement Count

ID: 19-07141-008
City: Dixon

Day: Tuesday
Date: 04/16/2019

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

Porter St — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing (NB)
AM	25	51	60	0	123
NOON	0	0	0	0	0
PM	60	69	96	0	188
Peds/Bikes	0	0	0	0	

A St — EASTBOUND

	AM	NOON	PM
Departing (WB)	392	0	338
U-Turn	0	0	0
Left	27	0	30
Through	341	0	319
Right	5	0	2

Red values beside eastbound movements: 0, 0, 0, 0

A St — WESTBOUND

	PM	NOON	AM
Right	79	0	71
Through	267	0	363
Left	59	0	61
U-Turn	0	0	0
Departing (EB)	427	0	417

Red values beside westbound movements: 0, 0, 0, 0

Porter St — NORTHBOUND

	Departing (SB)	U-Turn	Left	Through	Right
PM	130	0	11	79	12
NOON	0	0	0	0	0
AM	117	0	4	25	16
Peds/Bikes		0	0	0	0

CONTROL

0

	AM	NOON	PM
TEV	1049	0	1083
PHF	0.85		0.89

Total Vehicles (AM)

Approach	Left	Through	Right
Southbound	60	51	25
Eastbound	27	341	5
Westbound	61	363	71
Northbound	4	25	16

HT (AM)

Approach	Left	Through	Right
Southbound	0	4	1
Eastbound	1	4	0
Westbound	1	5	0
Northbound	0	1	0

Total Vehicles (Noon)

Approach	Left	Through	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

HT (NOON)

Approach	Left	Through	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Left	Through	Right
Southbound	96	69	60
Eastbound	30	319	2
Westbound	59	267	79
Northbound	11	79	12

HT (PM)

Approach	Left	Through	Right
Southbound	0	3	0
Eastbound	0	1	0
Westbound	0	1	0
Northbound	0	5	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound	0	0	2
North	Westbound	8	0	0
West	Southbound	1	0	0
West	Northbound	2	0	1
East	Southbound	0	0	0
East	Northbound	1	0	0
South	Eastbound	0	0	0
South	Westbound	1	0	0
NW corner (diagonal)		0	0	0
NE corner (diagonal)		0	0	0
SW corner (diagonal)		0	0	0
SE corner (diagonal)		0	0	0

Prepared by National Data & Surveying Services

Jackson St & A St

Peak Hour Turning Movement Count

ID: 19-07141-002
City: Dixon

Day: Tuesday
Date: 04/16/2019

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Jackson St — SOUTHBOUND

AM	19	1	1	0	47
NOON	0	0	0	0	0
PM	78	2	8	0	41
	0	0	0	0	

A St — EASTBOUND

	AM	NOON	PM	
	504	0	424	
	0	0	0	0
	39	0	25	0
	317	0	354	0
	115	0	111	0

A St — WESTBOUND

	PM	NOON	AM
0	7	0	4
0	244	0	397
0	7	0	11
0	0	0	0
	423	0	347

CONTROL

0

	AM	NOON	PM
TEV	1025	0	1008
PHF	0.83		0.94

Jackson St — NORTHBOUND

		0	0	0	0
PM	120	0	102	9	61
NOON	0	0	0	0	0
AM	127	0	88	4	29

Total Vehicles (AM)

Southbound	19	1	1
Eastbound	39	317	115
Westbound	4	397	11
Northbound	88	4	29

HT (AM)

Southbound	0	0	0
Eastbound	0	4	0
Westbound	0	5	0
Northbound	0	1	1

Total Vehicles (Noon)

Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

HT (NOON)

Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Southbound	78	2	8
Eastbound	25	354	111
Westbound	7	244	7
Northbound	102	9	61

HT (PM)

Southbound	0	0	0
Eastbound	0	1	0
Westbound	0	0	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North (west side)	1	0	5
North (east side)	9	0	7
West (north side)	0	0	1
West (south side)	0	0	0
East (north side)	1	0	2
East (south side)	5	0	5
South (west side)	2	0	0
South (east side)	0	0	2
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

Prepared by National Data & Surveying Services

Pitt School Rd & Porter Rd/Lincoln Hwy

Peak Hour Turning Movement Count

ID: 21-070024-002
City: Dixon

Day: Tuesday
Date: 03/02/2021

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Pitt School Rd — SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing (NB)
AM	4	14	1	0	13
NOON	0	0	0	0	0
PM	5	20	4	0	27
	0	0	0	0	

Porter Rd/Lincoln Hwy — EASTBOUND

	AM	NOON	PM	
Departing (WB)	71	0	79	
U-Turn	0	0	0	0
Left	1	0	4	0
Thru	60	0	130	0
Right	0	0	0	0

Porter Rd/Lincoln Hwy — WESTBOUND

		PM	NOON	AM
Right	0	3	0	3
Thru	0	73	0	66
Left	0	29	0	16
U-Turn	0	0	0	0
Departing (EB)		179	0	72

Pitt School Rd — NORTHBOUND

	Departing (SB)	U-Turn	Left	Thru	Right
		0	0	0	0
PM	49	0	1	20	45
NOON	0	0	0	0	0
AM	30	0	1	9	11

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	186	0	334
PHF	0.88		0.88

Total Vehicles (AM)

SB: 4 (right), 14 (thru), 1 (left); EB: 1 (left), 60 (thru), 0 (right); WB: 3 (right), 66 (thru), 16 (left); NB: 1 (left), 9 (thru), 11 (right)

Total Vehicles (Noon)

All movements: N/A

Total Vehicles (PM)

SB: 5 (right), 20 (thru), 4 (left); EB: 4 (left), 130 (thru), 0 (right); WB: 3 (right), 73 (thru), 29 (left); NB: 1 (left), 20 (thru), 45 (right)

Bikes (AM)

SB: 0, 0, 0; EB: 0, 0, 0; WB: 0, 0, 0; NB: 0, 0, 0

Bikes (NOON)

All movements: N/A

Bikes (PM)

SB: 0, 0, 1; EB: 0, 0, 0; WB: 0, 0, 0; NB: 0, 1, 0

Pedestrians (Crosswalks)

All crosswalks, all directions (AM, NOON, PM): 0

Prepared by National Data & Surveying Services

Valley Glen Dr & Parkway Blvd

Peak Hour Turning Movement Count

ID: 21-070024-003
City: Dixon

Day: Tuesday
Date: 03/02/2021

	PEAK HOURS	COUNT PERIODS
AM	07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Valley Glen Dr — SOUTHBOUND

	Right	Through	Left	U-Turn	Exit
AM	0	3	29	1	10
NOON	0	0	0	0	0
PM	0	1	20	1	30
	0	0	0	0	

Parkway Blvd — EASTBOUND

	AM	NOON	PM	
Exit	0	0	0	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

Parkway Blvd — WESTBOUND

		PM	NOON	AM
Right	0	29	0	7
Through	0	0	0	0
Left	0	3	0	1
U-Turn	0	0	0	0
Exit		27	0	30

Valley Glen Dr — NORTHBOUND

	Exit	U-Turn	Left	Through	Right
		0	0	0	0
PM	4	0	0	0	7
NOON	0	0	0	0	0
AM	4	0	0	2	1

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	44	0	61
PHF	0.92		0.80

Total Vehicles (AM)

Approach	Left	Through	Right	U-Turn
Southbound	29	3	0	
Westbound	1	0	7	
Northbound	0	2	1	
Eastbound	0	0	0	

Total Vehicles (Noon)

All movements: N/A

Total Vehicles (PM)

Approach	Left	Through	Right
Southbound	20	1	0
Westbound	3	0	29
Northbound	0	0	7
Eastbound	0	0	0

Bikes (AM)

All movements: 0

Bikes (NOON)

All movements: N/A

Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Westbound	0	0	6
Northbound	0	0	0
Eastbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (westward)	0	0	0
North leg (eastward)	0	0	0
West leg (southward)	0	0	4
West leg (northward)	0	0	2
East leg (southward)	0	0	1
East leg (northward)	2	0	4
South leg (eastward)	0	0	4
South leg (westward)	0	0	3
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

Prepared by National Data & Surveying Services

Pedrick Rd & Vaughn Rd

Peak Hour Turning Movement Count

ID: 20-070204-001
City: Dixon

Day: Wednesday
Date: 12/2/2020

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	4:00 PM - 06:00 PM

Pedrick Rd — SOUTHBOUND

	Right	Through	Left	U-Turn	Departing
AM	35	72	1	0	112
NOON	0	0	0	0	0
PM	55	93	4	0	151
Lanes	0	1	0	0	

Vaughn Rd — EASTBOUND

	AM	NOON	PM	Lanes
Departing	58	0	101	
U-Turn	0	0	0	0
Left	24	0	45	0
Through	20	0	53	1
Right	7	0	15	0

Vaughn Rd — WESTBOUND

	Lanes	PM	NOON	AM
Right	0	10	0	2
Through	1	32	0	19
Left	0	4	0	0
U-Turn	0	0	0	0
Departing		62	0	22

Pedrick Rd — NORTHBOUND

	Departing	U-Turn	Left	Through	Right
Lanes		0	0	1	0
PM	112	0	14	96	5
NOON	0	0	0	0	0
AM	79	0	4	86	1

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	271	0	426
PHF	0.87		0.93

Totals (AM)

Approach	Left	Through	Right
Southbound	1	72	35
Eastbound	24	20	7
Westbound	0	19	2
Northbound	4	86	1

Totals (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Totals (PM)

Approach	Left	Through	Right
Southbound	4	93	55
Eastbound	45	53	15
Westbound	4	32	10
Northbound	14	96	5

Total Bikes (AM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	1	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North leg	Eastbound	0	0	0
North leg	Westbound	0	0	0
South leg	Eastbound	0	0	0
South leg	Westbound	0	0	0
West leg	Southbound	0	0	0
West leg	Northbound	0	0	0
East leg	Southbound	0	0	0
East leg	Northbound	0	0	0
NW corner (diagonal)		0	0	0
NE corner (diagonal)		0	0	0
SW corner (diagonal)		0	0	0
SE corner (diagonal)		0	0	0

Peak Hour Volumes used for scaling from Dixon General Plan (2019-2020 Counts)

AM

		2019 Volumes				2020 Volumes (Covid)				Change			
Count #	Intersection	NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
10	Pedrick Rd N/O Vaughn Rd	155	181	-	-	136	134	-	-	12%	26%		
9	Pedrick Rd S/O Vaughn Rd	108	83	-	-	82	77	-	-	24%	7%		
5	Vaugn Rd E/O Pedrick Rd	-	-	40	44	-	-	37	41			8%	7%
11	Pitt School Rd S/O F St/Fairbanks	295	197	-	-	210	200	-	-	29%	-2%		
12	Pitt School S/O A St/Hillview	46	60	-	-	86	64	-	-	-87%	-7%		
8	A St E/O Evans Rd	-	-	221	304	-	-	214	209			3%	31%
21	A St E/O Pitt School	-	-	377	332	-	-	257	263			32%	21%
7	Porter Rd W/O Pitt School	86	103	-	-	84	77	-	-	2%	25%		
33	Pitt School S/O Midway	40	73	-	-			-	-	100%	100%		
26	Porter W/O Almond	88	107			98	87			-11%	19%		
	Total	818	804	638	680	696	639	508	513	15%	21%	20%	25%

PM

		2019 Volumes				2020 Volumes (Covid)				Change			
Count #	Intersection	NB	SB	EB	WB	NB	SB	EB	WB	NB	SB	EB	WB
10	Pedrick Rd N/O Vaughn Rd	181	206	-	-	227	190	-	-	-25%	8%		
9	Pedrick Rd S/O Vaughn Rd	109	157	-	-	130	118	-	-	-19%	25%		
5	Vaugn Rd E/O Pedrick Rd	-	-	68	59	-	-	53	44			22%	25%
11	Pitt School Rd S/O F St/Fairbanks	369	270	-	-	242	239	-	-	34%	11%		
12	Pitt School S/O A St/Hillview	83	48	-	-	94	80	-	-	-13%	-67%		
8	A St E/O Evans Rd	-	-	335	259	-	-	311	245			7%	5%
21	A St E/O Pitt School	-	-	323	349	-	-	339	291			-5%	17%
7	Porter Rd W/O Pitt School	168	83	-	-	137	78	-	-	18%	6%		
33	Pitt School S/O Midway	103	67	-	-			-	-	100%	100%		
26	Porter W/O Almond	165	112			157	112		-	5%	0%		
	Total	1178	943	726	667	987	817	703	580	16%	13%	3%	13%

+ means 2020 is lower
Large increase, no scaling factor
Large NB decrease but low volume means greater variability
Wherever we see growth, don't adjust; just use 2020 approach volume
Large NB decrease possibly due to closure s/o A Street, Pitt School closed

2020 TMC Scaled AM Counts														
Count ID	Intersection	**PHF**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
1	Pedrick Rd & Vaughn Rd	0.92	5	107	1	1	91	44	26	22	8	0	20	2
2	Pitt School Rd & A St	0.92	20	28	7	82	35	43	19	132	20	7	155	71
3	Pitt School Rd & Porter Rd	0.92	1	9	11	1	17	5	1	61	0	16	83	3
2020 TMC Scaled PM Counts														
1	Pedrick Rd & Vaughn Rd	0.92	24	154	8	8	194	104	85	104	36	6	68	20
2	Pitt School Rd & A St	0.92	17	40	7	125	43	60	97	223	15	15	187	113
3	Pitt School Rd & Porter Rd	0.92	1	20	47	4	20	5	5	153	0	29	77	3

2020/2021 Turning Movement Counts (Covid) AM														
Count ID	Intersection	**PHF**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
1	Pedrick Rd & Vaughn Rd	0.87	4	86	1	1	72	35	24	20	7	0	19	2
2	Pitt School Rd & A St	0.91	15	27	5	62	34	33	18	128	19	6	128	59
3	Pitt School Rd & Porter Rd	0.88	1	9	11	1	14	4	1	60	0	16	66	3
2020/2021 Turning Movement Counts (Covid) PM														
1	Pedrick Rd & Vaughn Rd	0.92	24	154	8	7	180	96	85	85	29	5	54	16
2	Pitt School Rd & A St	0.92	16	38	7	113	39	54	91	208	14	13	160	97
3	Pitt School Rd & Porter Rd	0.88	1	20	45	4	20	5	4	130	0	29	73	3

TMC Scale Factor (Peak Hour) AM														
Count ID	Intersection	**PHF**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
1	Pedrick Rd & Vaughn Rd	-	1.24	1.24	1.24	1.26	1.26	1.26	1.08	1.08	1.08	1.07	1.07	1.07
2	Pitt School Rd & A St	-	1.31	1.03	1.32	1.32	1.03	1.31	1.03	1.03	1.03	1.21	1.21	1.21
3	Pitt School Rd & Porter Rd	-	1.00	1.00	1.00	1.19	1.19	1.25	1.02	1.02	1.02	1.00	1.25	1.00
TMC Scale Factor (Peak Hour) PM														
1	Pedrick Rd & Vaughn Rd	-	1.00	1.00	1.00	1.08	1.08	1.08	1.00	1.22	1.25	1.25	1.25	1.25
2	Pitt School Rd & A St	-	1.05	1.05	1.05	1.11	1.11	1.11	1.07	1.07	1.07	1.17	1.17	1.17
3	Pitt School Rd & Porter Rd	-	1.00	1.00	1.05	1.00	1.00	1.00	1.18	1.18	1.18	1.00	1.06	1.00

2020/2021 Turning Movement Counts (Covid) scaled up using the TMC Scale Factor (based on peak hour volume differences from 2019) for 2020 TMC Scaled Counts used for Existing Conditions

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APPENDIX B – EXISTING SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	14	0	215	0	365	72	173	284	3
Future Vol, veh/h	0	0	0	14	0	215	0	365	72	173	284	3
Conflicting Peds, #/hr	0	0	0	12	0	0	0	0	12	12	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	90	-	-	105	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	5	2
Mvmt Flow	0	0	0	15	0	234	0	397	78	188	309	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1240	1174	323	1147	1136	448	312	0	0	487	0	0
Stage 1	687	687	-	448	448	-	-	-	-	-	-	-
Stage 2	553	487	-	699	688	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	152	192	718	176	202	611	1248	-	-	1076	-	-
Stage 1	437	447	-	590	573	-	-	-	-	-	-	-
Stage 2	517	550	-	430	447	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	81	156	710	149	164	604	1248	-	-	1064	-	-
Mov Cap-2 Maneuver	81	156	-	149	164	-	-	-	-	-	-	-
Stage 1	437	368	-	584	567	-	-	-	-	-	-	-
Stage 2	317	544	-	350	368	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.8	0	3.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	-	149	604	1064	-	-
HCM Lane V/C Ratio	-	-	-	-	0.102	0.387	0.177	-	-
HCM Control Delay (s)	0	-	-	0	31.9	14.7	9.1	-	-
HCM Lane LOS	A	-	-	A	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	1.8	0.6	-	-

HCM 6th Signalized Intersection Summary
2: First St & W A St/E A St

03/17/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	172	87	77	221	25	173	308	76	29	196	30
Future Volume (veh/h)	85	172	87	77	221	25	173	308	76	29	196	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	92	187	95	84	240	27	188	335	83	32	213	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	132	280	142	125	391	44	241	456	113	65	334	52
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.14	0.32	0.32	0.04	0.22	0.22
Sat Flow, veh/h	1781	1160	589	1781	1647	185	1781	1443	357	1781	1539	238
Grp Volume(v), veh/h	92	0	282	84	0	267	188	0	418	32	0	246
Grp Sat Flow(s),veh/h/ln	1781	0	1750	1781	0	1832	1781	0	1800	1781	0	1777
Q Serve(g_s), s	2.4	0.0	6.9	2.2	0.0	6.2	4.9	0.0	9.8	0.8	0.0	6.0
Cycle Q Clear(g_c), s	2.4	0.0	6.9	2.2	0.0	6.2	4.9	0.0	9.8	0.8	0.0	6.0
Prop In Lane	1.00		0.34	1.00		0.10	1.00		0.20	1.00		0.13
Lane Grp Cap(c), veh/h	132	0	422	125	0	435	241	0	569	65	0	386
V/C Ratio(X)	0.70	0.00	0.67	0.67	0.00	0.61	0.78	0.00	0.73	0.50	0.00	0.64
Avail Cap(c_a), veh/h	599	0	955	599	0	1000	599	0	983	599	0	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	16.4	21.6	0.0	16.2	19.9	0.0	14.5	22.5	0.0	16.9
Incr Delay (d2), s/veh	2.5	0.0	0.7	2.3	0.0	0.5	2.1	0.0	0.7	2.2	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.5	0.9	0.0	2.3	1.9	0.0	3.5	0.4	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	0.0	17.0	23.9	0.0	16.7	22.0	0.0	15.2	24.7	0.0	17.6
LnGrp LOS	C	A	B	C	A	B	C	A	B	C	A	B
Approach Vol, veh/h		374			351			606			278	
Approach Delay, s/veh		18.8			18.4			17.3			18.4	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.7	19.1	7.4	15.5	10.4	14.3	7.5	15.3				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	2.8	11.8	4.2	8.9	6.9	8.0	4.4	8.2				
Green Ext Time (p_c), s	0.0	1.5	0.1	1.0	0.2	0.8	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	313	115	11	392	4	88	3	28	1	1	19
Future Vol, veh/h	39	313	115	11	392	4	88	3	28	1	1	19
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	340	125	12	426	4	96	3	30	1	1	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	436	0	0	467	0	0	962	949	412	968	1009	444
Stage 1	-	-	-	-	-	-	489	489	-	458	458	-
Stage 2	-	-	-	-	-	-	473	460	-	510	551	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1124	-	-	1094	-	-	235	260	640	233	240	614
Stage 1	-	-	-	-	-	-	561	549	-	583	567	-
Stage 2	-	-	-	-	-	-	572	566	-	546	515	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1118	-	-	1092	-	-	212	241	635	206	222	605
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	241	-	206	222	-
Stage 1	-	-	-	-	-	-	531	519	-	550	556	-
Stage 2	-	-	-	-	-	-	538	555	-	486	487	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	33.4	12.3
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	252	1118	-	-	1092	-	-	515
HCM Lane V/C Ratio	0.513	0.038	-	-	0.011	-	-	0.044
HCM Control Delay (s)	33.4	8.3	0	-	8.3	0	-	12.3
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.7	0.1	-	-	0	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	341	5	61	363	71	4	25	16	60	51	25
Future Volume (veh/h)	27	341	5	61	363	71	4	25	16	60	51	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	29	371	5	66	395	77	4	27	17	65	55	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	62	515	7	118	582	492	10	168	106	117	255	125
Arrive On Green	0.03	0.28	0.28	0.07	0.31	0.31	0.01	0.16	0.16	0.07	0.22	0.22
Sat Flow, veh/h	1781	1841	25	1781	1870	1580	1781	1041	655	1781	1151	565
Grp Volume(v), veh/h	29	0	376	66	395	77	4	0	44	65	0	82
Grp Sat Flow(s),veh/h/ln	1781	0	1866	1781	1870	1580	1781	0	1696	1781	0	1717
Q Serve(g_s), s	0.6	0.0	6.8	1.3	6.9	1.3	0.1	0.0	0.8	1.3	0.0	1.5
Cycle Q Clear(g_c), s	0.6	0.0	6.8	1.3	6.9	1.3	0.1	0.0	0.8	1.3	0.0	1.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.39	1.00		0.33
Lane Grp Cap(c), veh/h	62	0	522	118	582	492	10	0	273	117	0	380
V/C Ratio(X)	0.47	0.00	0.72	0.56	0.68	0.16	0.41	0.00	0.16	0.56	0.00	0.22
Avail Cap(c_a), veh/h	761	0	1295	761	1298	1097	761	0	1177	761	0	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	12.2	17.0	11.3	9.3	18.6	0.0	13.5	17.0	0.0	11.9
Incr Delay (d2), s/veh	2.0	0.0	0.7	1.5	0.5	0.1	10.1	0.0	0.1	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.3	0.5	2.2	0.4	0.1	0.0	0.3	0.5	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	12.9	18.5	11.8	9.4	28.7	0.0	13.6	18.5	0.0	12.0
LnGrp LOS	B	A	B	B	B	A	C	A	B	B	A	B
Approach Vol, veh/h		405			538			48			147	
Approach Delay, s/veh		13.4			12.3			14.9			14.9	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	14.5	6.5	10.0	5.3	15.7	4.2	12.3				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	3.3	8.8	3.3	2.8	2.6	8.9	2.1	3.5				
Green Ext Time (p_c), s	0.0	1.4	0.0	0.1	0.0	1.6	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	132	20	7	155	71	20	28	7	82	35	43
Future Vol, veh/h	19	132	20	7	155	71	20	28	7	82	35	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	143	22	8	168	77	22	30	8	89	38	47
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	10.4	9.9	9.5	9.6
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	80%	0%	87%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	20%	0%	13%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	35	19	152	7	155	71	82	35	43
LT Vol	20	0	19	0	7	0	0	82	0	0
Through Vol	0	28	0	132	0	155	0	0	35	0
RT Vol	0	7	0	20	0	0	71	0	0	43
Lane Flow Rate	22	38	21	165	8	168	77	89	38	47
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.065	0.036	0.264	0.013	0.27	0.109	0.161	0.063	0.069
Departure Headway (Hd)	6.762	6.117	6.35	5.755	6.268	5.766	5.063	6.495	5.992	5.289
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	586	565	625	574	627	712	553	598	678
Service Time	4.495	3.85	4.079	3.484	3.968	3.466	2.763	4.225	3.722	3.018
HCM Lane V/C Ratio	0.042	0.065	0.037	0.264	0.014	0.268	0.108	0.161	0.064	0.069
HCM Control Delay	9.8	9.3	9.3	10.5	9.1	10.6	8.4	10.5	9.1	8.4
HCM Lane LOS	A	A	A	B	A	B	A	B	A	A
HCM 95th-tile Q	0.1	0.2	0.1	1.1	0	1.1	0.4	0.6	0.2	0.2

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	61	0	16	83	3	1	9	11	1	17	5
Future Vol, veh/h	1	61	0	16	83	3	1	9	11	1	17	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	66	0	17	90	3	1	10	12	1	18	5
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	7.5	7.7	7.4	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	0%	2%	16%	4%
Vol Thru, %	90%	0%	98%	81%	74%
Vol Right, %	0%	100%	0%	3%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	11	62	102	23
LT Vol	1	0	1	16	1
Through Vol	9	0	61	83	17
RT Vol	0	11	0	3	5
Lane Flow Rate	11	12	67	111	25
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.015	0.014	0.077	0.126	0.029
Departure Headway (Hd)	4.908	4.156	4.104	4.082	4.241
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	721	848	867	875	831
Service Time	2.697	1.945	2.157	2.125	2.333
HCM Lane V/C Ratio	0.015	0.014	0.077	0.127	0.03
HCM Control Delay	7.8	7	7.5	7.7	7.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0	0.2	0.4	0.1

7: Pedrick Rd & Vaughn Rd

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	22	8	0	20	2	5	107	1	1	91	44
Future Vol, veh/h	26	22	8	0	20	2	5	107	1	1	91	44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	28	24	9	0	22	2	5	116	1	1	99	48
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.7	8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	46%	0%	1%
Vol Thru, %	95%	39%	91%	67%
Vol Right, %	1%	14%	9%	32%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	113	56	22	136
LT Vol	5	26	0	1
Through Vol	107	22	20	91
RT Vol	1	8	2	44
Lane Flow Rate	123	61	24	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.143	0.077	0.03	0.164
Departure Headway (Hd)	4.197	4.556	4.539	3.982
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	841	791	793	885
Service Time	2.29	2.557	2.541	2.075
HCM Lane V/C Ratio	0.146	0.077	0.03	0.167
HCM Control Delay	8	7.9	7.7	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.2	0.1	0.6

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	0	88	10	2	37	18	211	6	13	236	28
Future Vol, veh/h	104	0	88	10	2	37	18	211	6	13	236	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	120	180	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	113	0	96	11	2	40	20	229	7	14	257	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	456	576	144	430	588	118	287	0	0	236	0	0
Stage 1	300	300	-	273	273	-	-	-	-	-	-	-
Stage 2	156	276	-	157	315	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	488	426	877	509	420	912	1272	-	-	1328	-	-
Stage 1	684	664	-	710	683	-	-	-	-	-	-	-
Stage 2	831	680	-	829	654	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	455	414	877	444	409	912	1272	-	-	1328	-	-
Mov Cap-2 Maneuver	455	414	-	444	409	-	-	-	-	-	-	-
Stage 1	673	657	-	699	672	-	-	-	-	-	-	-
Stage 2	779	669	-	731	647	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	10.2	0.6	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1272	-	-	455	877	438	912	1328	-	-
HCM Lane V/C Ratio	0.015	-	-	0.248	0.109	0.03	0.044	0.011	-	-
HCM Control Delay (s)	7.9	-	-	15.5	9.6	13.5	9.1	7.7	-	-
HCM Lane LOS	A	-	-	C	A	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0.4	0.1	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	5	25	40	3	84	4	125	56	147	178	12
Future Volume (veh/h)	31	5	25	40	3	84	4	125	56	147	178	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	5	27	43	3	91	4	136	61	160	193	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	30	164	89	241	395	10	243	109	415	586	497
Arrive On Green	0.04	0.12	0.12	0.05	0.13	0.13	0.01	0.20	0.20	0.12	0.31	0.31
Sat Flow, veh/h	1781	254	1370	1781	1870	1585	1781	1223	549	3456	1870	1585
Grp Volume(v), veh/h	34	0	32	43	3	91	4	0	197	160	193	13
Grp Sat Flow(s),veh/h/ln	1781	0	1624	1781	1870	1585	1781	0	1772	1728	1870	1585
Q Serve(g_s), s	0.6	0.0	0.6	0.7	0.0	1.4	0.1	0.0	3.1	1.3	2.5	0.2
Cycle Q Clear(g_c), s	0.6	0.0	0.6	0.7	0.0	1.4	0.1	0.0	3.1	1.3	2.5	0.2
Prop In Lane	1.00		0.84	1.00		1.00	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	73	0	195	89	241	395	10	0	352	415	586	497
V/C Ratio(X)	0.47	0.00	0.16	0.48	0.01	0.23	0.41	0.00	0.56	0.39	0.33	0.03
Avail Cap(c_a), veh/h	285	0	1609	683	2272	2115	285	0	1982	663	2152	1824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	0.0	12.4	14.5	11.9	9.4	15.5	0.0	11.3	12.7	8.2	7.4
Incr Delay (d2), s/veh	4.6	0.0	0.4	4.0	0.0	0.3	25.5	0.0	1.4	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	0.3	0.0	0.4	0.1	0.0	0.9	0.4	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	0.0	12.7	18.5	11.9	9.7	41.0	0.0	12.7	13.3	8.6	7.5
LnGrp LOS	B	A	B	B	B	A	D	A	B	B	A	A
Approach Vol, veh/h		66			137			201			366	
Approach Delay, s/veh		16.1			12.5			13.3			10.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	10.2	5.6	7.8	4.2	13.8	5.3	8.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	3.3	5.1	2.7	2.6	2.1	4.5	2.6	3.4
Green Ext Time (p_c), s	0.1	1.1	0.0	0.1	0.0	1.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	14	0	123	0	388	71	135	519	0
Future Vol, veh/h	1	0	0	14	0	123	0	388	71	135	519	0
Conflicting Peds, #/hr	0	0	0	12	0	0	0	0	12	12	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	90	-	-	105	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	15	0	134	0	422	77	147	564	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1386	1369	576	1343	1331	473	564	0	0	511	0	0
Stage 1	858	858	-	473	473	-	-	-	-	-	-	-
Stage 2	528	511	-	870	858	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	146	517	129	154	591	1008	-	-	1054	-	-
Stage 1	352	374	-	572	558	-	-	-	-	-	-	-
Stage 2	534	537	-	346	374	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	83	124	511	112	131	584	1008	-	-	1042	-	-
Mov Cap-2 Maneuver	83	124	-	112	131	-	-	-	-	-	-	-
Stage 1	352	321	-	566	552	-	-	-	-	-	-	-
Stage 2	412	531	-	294	321	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	48.9	16	0	1.9
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1008	-	-	83	112	584	1042	-	-
HCM Lane V/C Ratio	-	-	-	0.013	0.136	0.229	0.141	-	-
HCM Control Delay (s)	0	-	-	48.9	42.1	13	9	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0.9	0.5	-	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	299	65	179	121	346	79	437
v/c Ratio	0.49	0.68	0.32	0.47	0.46	0.52	0.36	0.69
Control Delay	38.7	32.9	39.1	31.2	38.8	24.4	39.1	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	32.9	39.1	31.2	38.8	24.4	39.1	31.4
Queue Length 50th (ft)	59	116	29	69	53	120	35	171
Queue Length 95th (ft)	133	227	76	149	121	266	88	#413
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	482	780	482	799	482	836	482	816
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	0.28	0.38	0.13	0.22	0.25	0.41	0.16	0.54

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 (veh/h)	125	167	108	60	126	39	111	281	38	73	372	30
Future Volume (veh/h)	125	167	108	60	126	39	111	281	38	73	372	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	182	117	65	137	42	121	305	41	79	404	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	176	258	166	104	279	85	157	522	70	116	513	42
Arrive On Green	0.10	0.24	0.24	0.06	0.20	0.20	0.09	0.32	0.32	0.07	0.30	0.30
Sat Flow, veh/h	1781	1054	678	1781	1364	418	1781	1611	217	1781	1704	139
Grp Volume(v), veh/h	136	0	299	65	0	179	121	0	346	79	0	437
Grp Sat Flow(s),veh/h/ln	1781	0	1732	1781	0	1783	1781	0	1828	1781	0	1843
Q Serve(g_s), s	3.9	0.0	8.2	1.9	0.0	4.6	3.5	0.0	8.2	2.3	0.0	11.3
Cycle Q Clear(g_c), s	3.9	0.0	8.2	1.9	0.0	4.6	3.5	0.0	8.2	2.3	0.0	11.3
Prop In Lane	1.00		0.39	1.00		0.23	1.00		0.12	1.00		0.08
Lane Grp Cap(c), veh/h	176	0	424	104	0	364	157	0	592	116	0	555
V/C Ratio(X)	0.77	0.00	0.71	0.62	0.00	0.49	0.77	0.00	0.58	0.68	0.00	0.79
Avail Cap(c_a), veh/h	547	0	864	547	0	890	547	0	912	547	0	920
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.9	0.0	18.0	24.0	0.0	18.3	23.2	0.0	14.7	23.8	0.0	16.7
Incr Delay (d2), s/veh	2.7	0.0	0.8	2.3	0.0	0.4	3.0	0.0	0.3	2.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.0	0.8	0.0	1.8	1.5	0.0	3.0	1.0	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	0.0	18.8	26.2	0.0	18.7	26.2	0.0	15.0	26.4	0.0	17.6
LnGrp LOS	C	A	B	C	A	B	C	A	B	C	A	B
Approach Vol, veh/h		435			244			467			516	
Approach Delay, s/veh		20.9			20.7			17.9			19.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	20.9	7.0	16.7	8.6	19.7	9.2	14.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	4.3	10.2	3.9	10.2	5.5	13.3	5.9	6.6
Green Ext Time (p_c), s	0.1	1.2	0.0	1.1	0.1	1.5	0.1	0.6

Intersection Summary			
HCM 6th Ctrl Delay			19.4
HCM 6th LOS			B

Intersection												
Int Delay, s/veh	6.8											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	25	351	111	7	244	7	102	9	61	8	2	78
Future Vol, veh/h	25	351	111	7	244	7	102	9	61	8	2	78
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	382	121	8	265	8	111	10	66	9	2	85

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	279	0	0	505	0	0	838	794	452	833	850	285
Stage 1	-	-	-	-	-	-	499	499	-	291	291	-
Stage 2	-	-	-	-	-	-	339	295	-	542	559	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1284	-	-	1060	-	-	286	321	608	288	298	754
Stage 1	-	-	-	-	-	-	554	544	-	717	672	-
Stage 2	-	-	-	-	-	-	676	669	-	525	511	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1277	-	-	1058	-	-	242	306	603	240	284	743
Mov Cap-2 Maneuver	-	-	-	-	-	-	242	306	-	240	284	-
Stage 1	-	-	-	-	-	-	536	527	-	691	662	-
Stage 2	-	-	-	-	-	-	586	659	-	442	495	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	32.4	12.1
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	312	1277	-	-	1058	-	-	605
HCM Lane V/C Ratio	0.599	0.021	-	-	0.007	-	-	0.158
HCM Control Delay (s)	32.4	7.9	0	-	8.4	0	-	12.1
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	3.6	0.1	-	-	0	-	-	0.6

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	349	64	290	86	12	99	104	140
v/c Ratio	0.13	0.60	0.23	0.43	0.14	0.05	0.31	0.32	0.23
Control Delay	28.2	21.8	27.3	16.2	4.0	28.9	25.4	26.6	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	21.8	27.3	16.2	4.0	28.9	25.4	26.6	13.5
Queue Length 50th (ft)	10	96	19	51	0	4	27	30	20
Queue Length 95th (ft)	39	210	62	164	23	21	81	87	83
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	719	1105	719	1110	962	719	1086	719	1031
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	0.05	0.32	0.09	0.26	0.09	0.02	0.09	0.14	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	319	2	59	267	79	11	79	12	96	69	60
Future Volume (veh/h)	30	319	2	59	267	79	11	79	12	96	69	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	347	2	64	290	86	12	86	13	104	75	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	483	3	116	535	452	28	255	38	157	214	186
Arrive On Green	0.04	0.26	0.26	0.06	0.29	0.29	0.02	0.16	0.16	0.09	0.23	0.23
Sat Flow, veh/h	1781	1858	11	1781	1870	1580	1781	1583	239	1781	920	797
Grp Volume(v), veh/h	33	0	349	64	290	86	12	0	99	104	0	140
Grp Sat Flow(s),veh/h/ln	1781	0	1868	1781	1870	1580	1781	0	1823	1781	0	1717
Q Serve(g_s), s	0.7	0.0	6.4	1.3	4.9	1.5	0.3	0.0	1.8	2.1	0.0	2.6
Cycle Q Clear(g_c), s	0.7	0.0	6.4	1.3	4.9	1.5	0.3	0.0	1.8	2.1	0.0	2.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.13	1.00		0.46
Lane Grp Cap(c), veh/h	69	0	486	116	535	452	28	0	293	157	0	400
V/C Ratio(X)	0.48	0.00	0.72	0.55	0.54	0.19	0.43	0.00	0.34	0.66	0.00	0.35
Avail Cap(c_a), veh/h	759	0	1244	759	1295	1094	759	0	1262	759	0	1189
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	12.6	17.0	11.3	10.1	18.3	0.0	14.0	16.6	0.0	12.0
Incr Delay (d2), s/veh	1.9	0.0	0.8	1.5	0.3	0.1	3.8	0.0	0.3	1.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.2	0.5	1.6	0.4	0.1	0.0	0.6	0.8	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.6	0.0	13.4	18.6	11.6	10.2	22.2	0.0	14.2	18.4	0.0	12.2
LnGrp LOS	B	A	B	B	B	B	C	A	B	B	A	B
Approach Vol, veh/h		382			440			111			244	
Approach Delay, s/veh		13.9			12.4			15.1			14.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	13.8	7.3	10.0	5.5	14.7	4.6	12.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	25.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.3	8.4	4.1	3.8	2.7	6.9	2.3	4.6
Green Ext Time (p_c), s	0.0	1.2	0.1	0.3	0.0	1.2	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	223	15	15	187	113	17	40	7	125	43	60
Future Vol, veh/h	97	223	15	15	187	113	17	40	7	125	43	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	242	16	16	203	123	18	43	8	136	47	65
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	13.8	12	11	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	85%	0%	94%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	15%	0%	6%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	47	97	238	15	187	113	125	43	60
LT Vol	17	0	97	0	15	0	0	125	0	0
Through Vol	0	40	0	223	0	187	0	0	43	0
RT Vol	0	7	0	15	0	0	113	0	0	60
Lane Flow Rate	18	51	105	259	16	203	123	136	47	65
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.104	0.205	0.463	0.032	0.373	0.201	0.281	0.09	0.113
Departure Headway (Hd)	7.914	7.301	6.998	6.449	7.116	6.611	5.904	7.438	6.933	6.225
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	450	487	510	556	501	541	604	481	514	572
Service Time	5.71	5.096	4.77	4.221	4.892	4.387	3.679	5.218	4.713	4.004
HCM Lane V/C Ratio	0.04	0.105	0.206	0.466	0.032	0.375	0.204	0.283	0.091	0.114
HCM Control Delay	11.1	11	11.6	14.7	10.1	13.3	10.2	13.1	10.4	9.8
HCM Lane LOS	B	B	B	B	B	B	B	B	B	A
HCM 95th-tile Q	0.1	0.3	0.8	2.4	0.1	1.7	0.7	1.1	0.3	0.4

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	153	0	29	77	3	1	20	47	4	20	5
Future Vol, veh/h	5	153	0	29	77	3	1	20	47	4	20	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	166	0	32	84	3	1	22	51	4	22	5
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	8.5	8.2	7.7	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	0%	3%	27%	14%
Vol Thru, %	95%	0%	97%	71%	69%
Vol Right, %	0%	100%	0%	3%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	47	158	109	29
LT Vol	1	0	5	29	4
Through Vol	20	0	153	77	20
RT Vol	0	47	0	3	5
Lane Flow Rate	23	51	172	118	32
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.033	0.064	0.206	0.145	0.041
Departure Headway (Hd)	5.244	4.516	4.32	4.404	4.706
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	685	795	833	817	762
Service Time	2.962	2.233	2.331	2.416	2.726
HCM Lane V/C Ratio	0.034	0.064	0.206	0.144	0.042
HCM Control Delay	8.1	7.5	8.5	8.2	7.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.8	0.5	0.1

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	104	36	6	68	20	24	154	8	8	194	104
Future Vol, veh/h	85	104	36	6	68	20	24	154	8	8	194	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	92	113	39	7	74	22	26	167	9	9	211	113
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.8	9.8	10.8	12.4
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	38%	6%	3%
Vol Thru, %	83%	46%	72%	63%
Vol Right, %	4%	16%	21%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	186	225	94	306
LT Vol	24	85	6	8
Through Vol	154	104	68	194
RT Vol	8	36	20	104
Lane Flow Rate	202	245	102	333
Geometry Grp	1	1	1	1
Degree of Util (X)	0.304	0.373	0.161	0.466
Departure Headway (Hd)	5.421	5.496	5.668	5.044
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	653	631	715
Service Time	3.463	3.535	3.716	3.08
HCM Lane V/C Ratio	0.306	0.375	0.162	0.466
HCM Control Delay	10.8	11.8	9.8	12.4
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	1.3	1.7	0.6	2.5

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	71	1	37	6	0	14	78	257	18	26	179	103
Future Vol, veh/h	71	1	37	6	0	14	78	257	18	26	179	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	120	180	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	77	1	40	7	0	15	85	279	20	28	195	112

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	617	776	154	613	822	150	307	0	0	299	0	0
Stage 1	307	307	-	459	459	-	-	-	-	-	-	-
Stage 2	310	469	-	154	363	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	374	327	864	377	307	870	1250	-	-	1259	-	-
Stage 1	678	660	-	551	565	-	-	-	-	-	-	-
Stage 2	675	559	-	833	623	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	298	864	334	280	870	1250	-	-	1259	-	-
Mov Cap-2 Maneuver	343	298	-	334	280	-	-	-	-	-	-	-
Stage 1	632	645	-	514	527	-	-	-	-	-	-	-
Stage 2	618	521	-	775	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	11.2	1.8	0.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1250	-	-	342	864	334	870	1259	-	-
HCM Lane V/C Ratio	0.068	-	-	0.229	0.047	0.02	0.017	0.022	-	-
HCM Control Delay (s)	8.1	-	-	18.6	9.4	16	9.2	7.9	-	-
HCM Lane LOS	A	-	-	C	A	C	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	0.1	0.1	0.1	0.1	-	-

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	22	13	28	89	16	312	71	151	21
v/c Ratio	0.08	0.01	0.08	0.12	0.05	0.31	0.11	0.09	0.02
Control Delay	24.9	0.0	22.2	0.3	24.9	12.8	21.6	9.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	0.0	22.2	0.3	24.9	12.8	21.6	9.2	0.0
Queue Length 50th (ft)	2	0	2	0	1	21	3	0	0
Queue Length 95th (ft)	37	0	41	0	30	237	42	116	0
Internal Link Dist (ft)		724				533		637	
Turn Bay Length (ft)	80				350		320		
Base Capacity (vph)	291	1472	697	756	291	1605	677	1636	1407
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	0.08	0.01	0.04	0.12	0.05	0.19	0.10	0.09	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	12	26	0	82	15	254	33	65	139	19
Future Volume (veh/h)	20	0	12	26	0	82	15	254	33	65	139	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	0	13	28	0	89	16	276	36	71	151	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	0	168	62	210	295	37	440	57	255	607	514
Arrive On Green	0.03	0.00	0.11	0.03	0.00	0.11	0.02	0.27	0.27	0.07	0.32	0.32
Sat Flow, veh/h	1781	0	1585	1781	1870	1585	1781	1621	211	3456	1870	1585
Grp Volume(v), veh/h	22	0	13	28	0	89	16	0	312	71	151	21
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	1585	1781	0	1832	1728	1870	1585
Q Serve(g_s), s	0.4	0.0	0.2	0.5	0.0	1.5	0.3	0.0	4.6	0.6	1.8	0.3
Cycle Q Clear(g_c), s	0.4	0.0	0.2	0.5	0.0	1.5	0.3	0.0	4.6	0.6	1.8	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	50	0	168	62	210	295	37	0	497	255	607	514
V/C Ratio(X)	0.44	0.00	0.08	0.46	0.00	0.30	0.43	0.00	0.63	0.28	0.25	0.04
Avail Cap(c_a), veh/h	287	0	1581	688	2286	2054	287	0	2063	667	2166	1836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	12.5	14.7	0.0	10.9	15.0	0.0	9.9	13.6	7.7	7.2
Incr Delay (d2), s/veh	6.1	0.0	0.2	5.2	0.0	0.6	7.8	0.0	1.3	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	0.2	0.0	0.4	0.2	0.0	1.3	0.2	0.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	12.7	19.9	0.0	11.5	22.8	0.0	11.3	14.2	7.9	7.2
LnGrp LOS	C	A	B	B	A	B	C	A	B	B	A	A
Approach Vol, veh/h		35			117			328			243	
Approach Delay, s/veh		17.9			13.5			11.8			9.7	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	12.4	5.1	7.3	4.6	14.1	4.9	7.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	2.6	6.6	2.5	2.2	2.3	3.8	2.4	3.5
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	0.8	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

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APPENDIX C – LOS SUMMARY TABLE AND SYNCHRO REPORTS FOR FUTURE SCENARIOS

TABLE 1: FUTURE (2040) INTERSECTION OPERATIONS

INTERSECTION		BASELINE SCENARIO		SCENARIO A		SCENARIO B	
		DELAY (S)	LOS	DELAY (S)	LOS	DELAY (S)	LOS
AM PEAK HOUR							
1C	PEDERICK RD/ VAUGHN RD	1 / 11	A / B	9	A	1 / 11	A / B
2B	FIRST ST/ C ST	5 / 39	A / E	5 / 40	A / E	5 / 40	A / E
2C	ADAMS ST/ PORTER ST/ A ST	14	B	14	B	14	B
2F	JACKSON ST/ A ST	8 / 63	A / F	12 / 103	B / F	6 / 48	A / E
2G	FIRST ST/ A ST	19	B	21	C	19	B
3B	PITT SCHOOL RD/ PORTER ST	8	A	8	A	8	A
3C	PITT SCHOOL RD/ A ST	13	B	13	B	13	B
PM PEAK HOUR							
1C	PEDERICK RD/ VAUGHN RD	3 / 16	A / C	12	B	3 / 16	A / C
2B	FIRST ST/ C ST	3 / 82	A / F	3 / 67	A / F	3 / 77	A / F
2C	ADAMS ST/ PORTER ST/ A ST	15	B	15	B	16	B
2F	JACKSON ST/ A ST	14 / 76	B / F	20 / 122	A / F	13 / 66	A / F
2G	FIRST ST/ A ST	21	C	23	C	22	C
3B	PITT SCHOOL RD/ PORTER ST	9	A	8	A	8	A
3C	PITT SCHOOL RD/ A ST	23	C	23	C	24	C

Intersection	
Int Delay, s/veh	6.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	255	405	75	185	325
Future Vol, veh/h	15	255	405	75	185	325
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	5
Mvmt Flow	16	277	440	82	201	353

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1260	493	0	0	534	0
Stage 1	493	-	-	-	-	-
Stage 2	767	-	-	-	-	-
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	188	576	-	-	1034	-
Stage 1	614	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	148	569	-	-	1022	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	364	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.6	0	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	491	1022	-
HCM Lane V/C Ratio	-	-	0.598	0.197	-
HCM Control Delay (s)	-	-	22.6	9.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.9	0.7	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	278	76	305	190	424	38	271
v/c Ratio	0.43	0.60	0.36	0.69	0.60	0.59	0.21	0.65
Control Delay	39.4	29.7	39.4	35.2	40.0	24.9	39.6	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	29.7	39.4	35.2	40.0	24.9	39.6	34.0
Queue Length 50th (ft)	43	100	32	120	78	155	16	102
Queue Length 95th (ft)	111	217	89	255	#190	334	54	226
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	471	780	471	794	471	818	471	770
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	0.22	0.36	0.16	0.38	0.40	0.52	0.08	0.35

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 (veh/h)	95	180	75	70	250	30	175	320	70	35	210	40
Future Volume (veh/h)	95	180	75	70	250	30	175	320	70	35	210	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	103	196	82	76	272	33	190	348	76	38	228	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	135	315	132	116	395	48	242	478	104	73	338	64
Arrive On Green	0.08	0.25	0.25	0.07	0.24	0.24	0.14	0.32	0.32	0.04	0.23	0.23
Sat Flow, veh/h	1781	1244	520	1781	1632	198	1781	1483	324	1781	1488	281
Grp Volume(v), veh/h	103	0	278	76	0	305	190	0	424	38	0	271
Grp Sat Flow(s),veh/h/ln	1781	0	1764	1781	0	1830	1781	0	1807	1781	0	1769
Q Serve(g_s), s	2.8	0.0	7.0	2.1	0.0	7.6	5.2	0.0	10.4	1.0	0.0	7.0
Cycle Q Clear(g_c), s	2.8	0.0	7.0	2.1	0.0	7.6	5.2	0.0	10.4	1.0	0.0	7.0
Prop In Lane	1.00		0.29	1.00		0.11	1.00		0.18	1.00		0.16
Lane Grp Cap(c), veh/h	135	0	447	116	0	443	242	0	582	73	0	402
V/C Ratio(X)	0.76	0.00	0.62	0.66	0.00	0.69	0.78	0.00	0.73	0.52	0.00	0.67
Avail Cap(c_a), veh/h	568	0	913	568	0	947	568	0	935	568	0	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	16.6	22.9	0.0	17.3	21.0	0.0	15.1	23.6	0.0	17.7
Incr Delay (d2), s/veh	3.3	0.0	0.5	2.3	0.0	0.7	2.1	0.0	0.7	2.1	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.6	0.9	0.0	2.9	2.1	0.0	3.7	0.5	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	0.0	17.2	25.3	0.0	18.0	23.1	0.0	15.7	25.7	0.0	18.5
LnGrp LOS	C	A	B	C	A	B	C	A	B	C	A	B
Approach Vol, veh/h		381			381			614			309	
Approach Delay, s/veh		19.6			19.5			18.0			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	20.2	7.3	16.7	10.8	15.4	7.8	16.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.0	12.4	4.1	9.0	7.2	9.0	4.8	9.6
Green Ext Time (p_c), s	0.0	1.5	0.1	1.0	0.2	0.9	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	325	125	10	430	10	95	5	30	0	0	30
Future Vol, veh/h	75	325	125	10	430	10	95	5	30	0	0	30
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	82	353	136	11	467	11	103	5	33	0	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	484	0	0	491	0	0	1108	1093	430	1112	1156	489
Stage 1	-	-	-	-	-	-	587	587	-	501	501	-
Stage 2	-	-	-	-	-	-	521	506	-	611	655	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1079	-	-	1072	-	-	187	214	625	186	197	579
Stage 1	-	-	-	-	-	-	496	497	-	552	543	-
Stage 2	-	-	-	-	-	-	539	540	-	481	463	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1073	-	-	1070	-	-	158	187	620	155	172	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	187	-	155	172	-
Stage 1	-	-	-	-	-	-	442	443	-	490	532	-
Stage 2	-	-	-	-	-	-	496	529	-	399	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0.2	63	11.7
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	192	1073	-	-	1070	-	-	570
HCM Lane V/C Ratio	0.736	0.076	-	-	0.01	-	-	0.057
HCM Control Delay (s)	63	8.6	0	-	8.4	0	-	11.7
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	4.8	0.2	-	-	0	-	-	0.2

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	391	54	424	120	5	59	82	98
v/c Ratio	0.19	0.57	0.21	0.61	0.18	0.02	0.23	0.28	0.19
Control Delay	27.1	18.3	27.0	19.1	4.3	28.4	22.5	26.6	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	18.3	27.0	19.1	4.3	28.4	22.5	26.6	14.6
Queue Length 50th (ft)	15	101	16	112	0	2	13	24	15
Queue Length 95th (ft)	49	213	52	233	30	12	49	70	63
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	688	1111	688	1114	973	688	1052	688	1031
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	0.07	0.35	0.08	0.38	0.12	0.01	0.06	0.12	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	355	5	50	390	110	5	40	15	75	55	35
Future Volume (veh/h)	45	355	5	50	390	110	5	40	15	75	55	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	49	386	5	54	424	120	5	43	16	82	60	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	94	558	7	101	574	485	12	196	73	134	233	148
Arrive On Green	0.05	0.30	0.30	0.06	0.31	0.31	0.01	0.16	0.16	0.08	0.22	0.22
Sat Flow, veh/h	1781	1842	24	1781	1870	1580	1781	1263	470	1781	1040	659
Grp Volume(v), veh/h	49	0	391	54	424	120	5	0	59	82	0	98
Grp Sat Flow(s),veh/h/ln	1781	0	1866	1781	1870	1580	1781	0	1732	1781	0	1699
Q Serve(g_s), s	1.0	0.0	7.2	1.2	7.9	2.2	0.1	0.0	1.2	1.7	0.0	1.9
Cycle Q Clear(g_c), s	1.0	0.0	7.2	1.2	7.9	2.2	0.1	0.0	1.2	1.7	0.0	1.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.27	1.00		0.39
Lane Grp Cap(c), veh/h	94	0	565	101	574	485	12	0	269	134	0	381
V/C Ratio(X)	0.52	0.00	0.69	0.53	0.74	0.25	0.42	0.00	0.22	0.61	0.00	0.26
Avail Cap(c_a), veh/h	730	0	1242	730	1245	1051	730	0	1153	730	0	1130
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	12.0	17.9	12.1	10.2	19.3	0.0	14.4	17.5	0.0	12.5
Incr Delay (d2), s/veh	1.7	0.0	0.6	1.6	0.7	0.1	8.3	0.0	0.2	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.4	0.5	2.6	0.6	0.1	0.0	0.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	0.0	12.6	19.5	12.9	10.3	27.6	0.0	14.6	19.2	0.0	12.6
LnGrp LOS	B	A	B	B	B	B	C	A	B	B	A	B
Approach Vol, veh/h		440			598			64			180	
Approach Delay, s/veh		13.4			12.9			15.6			15.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	15.8	6.9	10.1	6.1	16.0	4.3	12.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.2	9.2	3.7	3.2	3.0	9.9	2.1	3.9
Green Ext Time (p_c), s	0.0	1.4	0.1	0.1	0.0	1.8	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	160	50	10	145	125	70	140	15	80	75	65
Future Vol, veh/h	65	160	50	10	145	125	70	140	15	80	75	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	174	54	11	158	136	76	152	16	87	82	71
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	14.3	12.3	13.2	11.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	90%	0%	76%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	10%	0%	24%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	155	65	210	10	145	125	80	75	65
LT Vol	70	0	65	0	10	0	0	80	0	0
Through Vol	0	140	0	160	0	145	0	0	75	0
RT Vol	0	15	0	50	0	0	125	0	0	65
Lane Flow Rate	76	168	71	228	11	158	136	87	82	71
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.165	0.339	0.15	0.441	0.023	0.315	0.245	0.191	0.167	0.131
Departure Headway (Hd)	7.813	7.237	7.633	6.958	7.704	7.196	6.486	7.893	7.385	6.674
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	460	497	470	518	465	500	553	455	486	537
Service Time	5.556	4.98	5.374	4.699	5.446	4.938	4.227	5.637	5.128	4.417
HCM Lane V/C Ratio	0.165	0.338	0.151	0.44	0.024	0.316	0.246	0.191	0.169	0.132
HCM Control Delay	12.1	13.7	11.7	15.1	10.6	13.2	11.3	12.5	11.6	10.4
HCM Lane LOS	B	B	B	C	B	B	B	B	B	B
HCM 95th-tile Q	0.6	1.5	0.5	2.2	0.1	1.3	1	0.7	0.6	0.4

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	65	0	15	90	5	5	15	5	0	50	90
Future Vol, veh/h	5	65	0	15	90	5	5	15	5	0	50	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	71	0	16	98	5	5	16	5	0	54	98
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	8	8.2	7.9	8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	0%	7%	14%	0%
Vol Thru, %	75%	0%	93%	82%	36%
Vol Right, %	0%	100%	0%	5%	64%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	5	70	110	140
LT Vol	5	0	5	15	0
Through Vol	15	0	65	90	50
RT Vol	0	5	0	5	90
Lane Flow Rate	22	5	76	120	152
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.032	0.007	0.095	0.147	0.175
Departure Headway (Hd)	5.234	4.405	4.476	4.414	4.136
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	686	814	802	814	869
Service Time	2.953	2.123	2.496	2.432	2.151
HCM Lane V/C Ratio	0.032	0.006	0.095	0.147	0.175
HCM Control Delay	8.1	7.2	8	8.2	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.3	0.5	0.6

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	2	0	0	25	2	195	10	25	110	2
Future Vol, veh/h	2	2	2	0	0	25	2	195	10	25	110	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	0	0	27	2	212	11	27	120	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	285	402	61	337	398	112	122	0	0	223	0	0
Stage 1	175	175	-	222	222	-	-	-	-	-	-	-
Stage 2	110	227	-	115	176	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	645	535	991	593	538	920	1463	-	-	1343	-	-
Stage 1	810	753	-	760	718	-	-	-	-	-	-	-
Stage 2	883	715	-	877	752	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	615	522	991	579	525	920	1463	-	-	1343	-	-
Mov Cap-2 Maneuver	615	522	-	579	525	-	-	-	-	-	-	-
Stage 1	808	736	-	758	717	-	-	-	-	-	-	-
Stage 2	855	714	-	853	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	9	0.1	1.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1463	-	-	659	920	1343	-	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.03	0.02	-	-
HCM Control Delay (s)	7.5	0	-	10.5	9	7.7	0.1	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Intersection						
Int Delay, s/veh	2.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	30	15	200	100	35
Future Vol, veh/h	55	30	15	200	100	35
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	60	33	16	217	109	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	269	74	147	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	698	973	1432	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	689	973	1432	-	-	-
Mov Cap-2 Maneuver	689	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1432	-	689	973	-	-
HCM Lane V/C Ratio	0.011	-	0.087	0.034	-	-
HCM Control Delay (s)	7.5	0	10.7	8.8	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.1	-	-

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	98	16	38	22	256	11	310
v/c Ratio	0.40	0.24	0.06	0.09	0.10	0.12	0.05	0.14
Control Delay	19.5	5.3	14.5	0.5	19.8	6.3	19.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	5.3	14.5	0.5	19.8	6.3	19.4	6.2
Queue Length 50th (ft)	21	0	3	0	4	11	2	13
Queue Length 95th (ft)	66	25	16	0	24	45	15	53
Internal Link Dist (ft)	419		513			652		394
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	635	782	582	782	228	2181	228	2173
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	0.18	0.13	0.03	0.05	0.10	0.12	0.05	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	0	90	15	0	35	20	225	10	10	265	20
Future Volume (veh/h)	105	0	90	15	0	35	20	225	10	10	265	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	0	98	16	0	38	22	245	11	11	288	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	0	552	129	0	552	46	1372	61	25	1286	98
Arrive On Green	0.35	0.00	0.35	0.35	0.00	0.35	0.03	0.40	0.40	0.01	0.38	0.38
Sat Flow, veh/h	0	0	1585	0	0	1585	1781	3464	155	1781	3347	254
Grp Volume(v), veh/h	114	0	98	16	0	38	22	125	131	11	152	158
Grp Sat Flow(s),veh/h/ln	0	0	1585	0	0	1585	1781	1777	1842	1781	1777	1825
Q Serve(g_s), s	0.0	0.0	2.4	0.0	0.0	0.9	0.7	2.6	2.6	0.3	3.2	3.3
Cycle Q Clear(g_c), s	19.5	0.0	2.4	19.5	0.0	0.9	0.7	2.6	2.6	0.3	3.2	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.14
Lane Grp Cap(c), veh/h	129	0	552	129	0	552	46	704	730	25	683	701
V/C Ratio(X)	0.89	0.00	0.18	0.12	0.00	0.07	0.48	0.18	0.18	0.44	0.22	0.23
Avail Cap(c_a), veh/h	129	0	552	129	0	552	175	704	730	175	683	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	12.7	28.0	0.0	12.2	26.9	11.0	11.0	27.4	11.6	11.6
Incr Delay (d2), s/veh	46.7	0.0	0.2	0.4	0.0	0.1	7.5	0.6	0.5	11.7	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.8	0.2	0.0	0.3	0.4	0.9	1.0	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	0.0	12.8	28.4	0.0	12.2	34.3	11.5	11.5	39.0	12.4	12.4
LnGrp LOS	E	A	B	C	A	B	C	B	B	D	B	B
Approach Vol, veh/h		212			54			278			321	
Approach Delay, s/veh		46.1			17.0			13.3			13.3	
Approach LOS		D			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	26.7		24.0	5.9	26.0		24.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	21.5		19.5	5.5	21.5		19.5				
Max Q Clear Time (g_c+I1), s	2.3	4.6		21.5	2.7	5.3		21.5				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	1.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	38	54	87	16	130	16	239	207	168	38
v/c Ratio	0.11	0.14	0.25	0.03	0.20	0.07	0.42	0.37	0.14	0.04
Control Delay	25.5	9.4	24.9	15.0	3.8	29.9	17.5	28.0	14.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	9.4	24.9	15.0	3.8	29.9	17.5	28.0	14.3	0.1
Queue Length 50th (ft)	10	3	21	3	0	4	43	26	25	0
Queue Length 95th (ft)	52	27	87	16	23	28	160	#119	130	0
Internal Link Dist (ft)		774		782			690		652	
Turn Bay Length (ft)	80					350		320		
Base Capacity (vph)	343	1211	579	1501	645	241	1349	561	1461	1272
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	0.11	0.04	0.15	0.01	0.20	0.07	0.18	0.37	0.11	0.03

Intersection Summary

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

HCM 6th Signalized Intersection Summary
10: First St & Parkway Blvd

03/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	10	40	80	15	120	15	115	105	190	155	35
Future Volume (veh/h)	35	10	40	80	15	120	15	115	105	190	155	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	11	43	87	16	130	16	125	114	207	168	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	42	166	144	307	454	37	199	181	423	602	511
Arrive On Green	0.04	0.13	0.13	0.08	0.16	0.16	0.02	0.22	0.22	0.12	0.32	0.32
Sat Flow, veh/h	1781	333	1303	1781	1870	1585	1781	901	822	3456	1870	1585
Grp Volume(v), veh/h	38	0	54	87	16	130	16	0	239	207	168	38
Grp Sat Flow(s),veh/h/ln	1781	0	1636	1781	1870	1585	1781	0	1722	1728	1870	1585
Q Serve(g_s), s	0.7	0.0	1.1	1.7	0.3	2.3	0.3	0.0	4.5	2.0	2.4	0.6
Cycle Q Clear(g_c), s	0.7	0.0	1.1	1.7	0.3	2.3	0.3	0.0	4.5	2.0	2.4	0.6
Prop In Lane	1.00		0.80	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	78	0	208	144	307	454	37	0	380	423	602	511
V/C Ratio(X)	0.48	0.00	0.26	0.60	0.05	0.29	0.44	0.00	0.63	0.49	0.28	0.07
Avail Cap(c_a), veh/h	250	0	1424	600	1996	1885	250	0	1693	582	1891	1602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	14.0	15.8	12.5	9.9	17.2	0.0	12.6	14.6	9.0	8.4
Incr Delay (d2), s/veh	4.6	0.0	0.7	4.0	0.1	0.3	8.0	0.0	1.7	0.9	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.3	0.7	0.1	0.6	0.2	0.0	1.4	0.6	0.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	0.0	14.7	19.8	12.6	10.2	25.2	0.0	14.3	15.5	9.2	8.4
LnGrp LOS	C	A	B	B	B	B	C	A	B	B	A	A
Approach Vol, veh/h		92			233			255			413	
Approach Delay, s/veh		17.4			14.0			15.0			12.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	11.8	6.9	8.5	4.7	15.5	5.6	9.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	4.0	6.5	3.7	3.1	2.3	4.4	2.7	4.3
Green Ext Time (p_c), s	0.1	1.4	0.1	0.2	0.0	1.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	110	155	30	30	80	105
Future Vol, veh/h	110	155	30	30	80	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	168	33	33	87	114
Number of Lanes	1	1	1	1	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	9	8.1	9.3
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	30	110	155	80	105
LT Vol	0	0	110	0	80	0
Through Vol	30	0	0	0	0	105
RT Vol	0	30	0	155	0	0
Lane Flow Rate	33	33	120	168	87	114
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.05	0.043	0.19	0.211	0.14	0.168
Departure Headway (Hd)	5.473	4.766	5.721	4.517	5.815	5.311
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	653	748	628	794	617	675
Service Time	3.219	2.513	3.454	2.251	3.554	3.05
HCM Lane V/C Ratio	0.051	0.044	0.191	0.212	0.141	0.169
HCM Control Delay	8.5	7.7	9.8	8.5	9.5	9.1
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.7	0.8	0.5	0.6

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	145	435	80	165	640
Future Vol, veh/h	15	145	435	80	165	640
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	5
Mvmt Flow	16	158	473	87	179	696

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1595	529	0	0	572	0
Stage 1	529	-	-	-	-	-
Stage 2	1066	-	-	-	-	-
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	118	550	-	-	1001	-
Stage 1	591	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	95	544	-	-	990	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	268	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.5	0	1.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	377	990	-
HCM Lane V/C Ratio	-	-	0.461	0.181	-
HCM Control Delay (s)	-	-	22.5	9.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.4	0.7	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	147	288	60	190	120	358	103	494
v/c Ratio	0.57	0.58	0.34	0.61	0.52	0.52	0.48	0.75
Control Delay	41.3	28.9	40.5	36.6	41.1	24.7	41.2	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	28.9	40.5	36.6	41.1	24.7	41.2	33.3
Queue Length 50th (ft)	64	113	27	75	53	126	45	199
Queue Length 95th (ft)	140	217	72	156	119	281	106	#496
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	400	656	400	665	400	689	400	660
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	0.37	0.44	0.15	0.29	0.30	0.52	0.26	0.75

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 (veh/h)	135	170	95	55	130	45	110	290	40	95	415	40
Future Volume (veh/h)	135	170	95	55	130	45	110	290	40	95	415	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	147	185	103	60	141	49	120	315	43	103	451	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	190	263	146	97	241	84	156	551	75	134	541	52
Arrive On Green	0.11	0.23	0.23	0.05	0.18	0.18	0.09	0.34	0.34	0.08	0.33	0.33
Sat Flow, veh/h	1781	1119	623	1781	1316	457	1781	1608	219	1781	1639	156
Grp Volume(v), veh/h	147	0	288	60	0	190	120	0	358	103	0	494
Grp Sat Flow(s),veh/h/ln	1781	0	1742	1781	0	1773	1781	0	1827	1781	0	1795
Q Serve(g_s), s	4.4	0.0	8.3	1.8	0.0	5.4	3.6	0.0	8.8	3.1	0.0	13.9
Cycle Q Clear(g_c), s	4.4	0.0	8.3	1.8	0.0	5.4	3.6	0.0	8.8	3.1	0.0	13.9
Prop In Lane	1.00		0.36	1.00		0.26	1.00		0.12	1.00		0.09
Lane Grp Cap(c), veh/h	190	0	409	97	0	324	156	0	626	134	0	593
V/C Ratio(X)	0.78	0.00	0.70	0.62	0.00	0.59	0.77	0.00	0.57	0.77	0.00	0.83
Avail Cap(c_a), veh/h	521	0	829	521	0	843	521	0	869	521	0	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	19.2	25.3	0.0	20.4	24.4	0.0	14.7	24.8	0.0	16.9
Incr Delay (d2), s/veh	2.6	0.0	0.8	2.3	0.0	0.6	3.0	0.0	0.3	3.5	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	3.1	0.8	0.0	2.1	1.5	0.0	3.2	1.3	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	20.0	27.6	0.0	21.1	27.4	0.0	15.0	28.3	0.0	20.2
LnGrp LOS	C	A	C	C	A	C	C	A	B	C	A	C
Approach Vol, veh/h		435			250			478			597	
Approach Delay, s/veh		22.1			22.6			18.1			21.6	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	22.7	7.0	16.8	8.8	22.1	9.8	14.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	5.1	10.8	3.8	10.3	5.6	15.9	6.4	7.4
Green Ext Time (p_c), s	0.1	1.3	0.0	1.0	0.1	1.6	0.1	0.6

Intersection Summary			
HCM 6th Ctrl Delay			20.9
HCM 6th LOS			C

Intersection												
Int Delay, s/veh	14.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	360	125	5	265	10	115	15	55	10	5	130
Future Vol, veh/h	50	360	125	5	265	10	115	15	55	10	5	130
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	391	136	5	288	11	125	16	60	11	5	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	305	0	0	529	0	0	956	884	468	922	947	310
Stage 1	-	-	-	-	-	-	569	569	-	310	310	-
Stage 2	-	-	-	-	-	-	387	315	-	612	637	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1256	-	-	1038	-	-	238	284	595	251	261	730
Stage 1	-	-	-	-	-	-	507	506	-	700	659	-
Stage 2	-	-	-	-	-	-	637	656	-	480	471	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1249	-	-	1036	-	-	176	263	590	201	241	719
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	263	-	201	241	-
Stage 1	-	-	-	-	-	-	475	474	-	653	651	-
Stage 2	-	-	-	-	-	-	500	648	-	388	441	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	75.8	13.6
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	230	1249	-	-	1036	-	-	577
HCM Lane V/C Ratio	0.874	0.044	-	-	0.005	-	-	0.273
HCM Control Delay (s)	75.8	8	0	-	8.5	0	-	13.6
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	7.1	0.1	-	-	0	-	-	1.1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	429	60	364	125	11	114	147	185
v/c Ratio	0.22	0.61	0.25	0.52	0.19	0.06	0.39	0.45	0.32
Control Delay	32.1	22.8	32.0	20.3	4.8	33.1	30.4	30.7	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	22.8	32.0	20.3	4.8	33.1	30.4	30.7	14.5
Queue Length 50th (ft)	18	137	22	110	0	4	39	52	34
Queue Length 95th (ft)	54	289	63	236	34	21	98	121	106
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	596	999	596	1003	891	596	962	596	920
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	0.08	0.43	0.10	0.36	0.14	0.02	0.12	0.25	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	395	0	55	335	115	10	95	10	135	80	90
Future Volume (veh/h)	45	395	0	55	335	115	10	95	10	135	80	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	49	429	0	60	364	125	11	103	11	147	87	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	93	562	0	107	577	488	26	239	26	192	188	211
Arrive On Green	0.05	0.30	0.00	0.06	0.31	0.31	0.01	0.15	0.15	0.11	0.24	0.24
Sat Flow, veh/h	1781	1870	0	1781	1870	1580	1781	1618	173	1781	779	878
Grp Volume(v), veh/h	49	429	0	60	364	125	11	0	114	147	0	185
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	1870	1580	1781	0	1791	1781	0	1657
Q Serve(g_s), s	1.1	8.7	0.0	1.4	7.0	2.5	0.3	0.0	2.4	3.3	0.0	4.0
Cycle Q Clear(g_c), s	1.1	8.7	0.0	1.4	7.0	2.5	0.3	0.0	2.4	3.3	0.0	4.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.10	1.00		0.53
Lane Grp Cap(c), veh/h	93	562	0	107	577	488	26	0	264	192	0	399
V/C Ratio(X)	0.53	0.76	0.00	0.56	0.63	0.26	0.43	0.00	0.43	0.77	0.00	0.46
Avail Cap(c_a), veh/h	685	1168	0	685	1168	987	685	0	1119	685	0	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.2	13.2	0.0	19.0	12.4	10.8	20.3	0.0	16.2	18.1	0.0	13.5
Incr Delay (d2), s/veh	1.7	0.8	0.0	1.7	0.4	0.1	4.2	0.0	0.4	2.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	0.0	0.5	2.4	0.7	0.1	0.0	0.9	1.3	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	14.0	0.0	20.7	12.8	10.9	24.6	0.0	16.6	20.5	0.0	13.8
LnGrp LOS	C	B	A	C	B	B	C	A	B	C	A	B
Approach Vol, veh/h		478			549			125			332	
Approach Delay, s/veh		14.8			13.2			17.3			16.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	16.5	8.5	10.1	6.2	16.8	4.6	14.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.4	10.7	5.3	4.4	3.1	9.0	2.3	6.0
Green Ext Time (p_c), s	0.0	1.5	0.1	0.3	0.0	1.5	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	23.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	150	255	45	35	255	130	50	100	15	170	140	125
Future Vol, veh/h	150	255	45	35	255	130	50	100	15	170	140	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	163	277	49	38	277	141	54	109	16	185	152	136
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	30.7	23.8	16.8	18
HCM LOS	D	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	87%	0%	85%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	13%	0%	15%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	115	150	300	35	255	130	170	140	125
LT Vol	50	0	150	0	35	0	0	170	0	0
Through Vol	0	100	0	255	0	255	0	0	140	0
RT Vol	0	15	0	45	0	0	130	0	0	125
Lane Flow Rate	54	125	163	326	38	277	141	185	152	136
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.157	0.339	0.421	0.785	0.1	0.692	0.324	0.489	0.381	0.313
Departure Headway (Hd)	10.386	9.775	9.29	8.671	9.499	8.984	8.264	9.518	9.003	8.282
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	345	367	388	417	377	402	434	379	400	433
Service Time	8.161	7.55	7.052	6.432	7.264	6.749	6.029	7.279	6.764	6.043
HCM Lane V/C Ratio	0.157	0.341	0.42	0.782	0.101	0.689	0.325	0.488	0.38	0.314
HCM Control Delay	15.1	17.5	18.7	36.7	13.3	29.7	15	21.1	17.2	14.8
HCM Lane LOS	C	C	C	E	B	D	B	C	C	B
HCM 95th-tile Q	0.6	1.5	2	6.8	0.3	5.1	1.4	2.6	1.7	1.3

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	130	0	30	75	5	5	75	10	5	45	15
Future Vol, veh/h	65	130	0	30	75	5	5	75	10	5	45	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	141	0	33	82	5	5	82	11	5	49	16
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.3	8.5	8.8	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	33%	27%	8%
Vol Thru, %	94%	0%	67%	68%	69%
Vol Right, %	0%	100%	0%	5%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	10	195	110	65
LT Vol	5	0	65	30	5
Through Vol	75	0	130	75	45
RT Vol	0	10	0	5	15
Lane Flow Rate	87	11	212	120	71
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.131	0.014	0.269	0.154	0.095
Departure Headway (Hd)	5.413	4.676	4.571	4.636	4.825
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	662	764	786	772	740
Service Time	3.152	2.415	2.6	2.67	2.867
HCM Lane V/C Ratio	0.131	0.014	0.27	0.155	0.096
HCM Control Delay	9	7.5	9.3	8.5	8.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	0	1.1	0.5	0.3

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	2	2	2	15	0	100	2	215	15	115	310	2
Future Vol, veh/h	2	2	2	15	0	100	2	215	15	115	310	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	16	0	109	2	234	16	125	337	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	709	842	170	666	835	125	339	0	0	250	0	0
Stage 1	588	588	-	246	246	-	-	-	-	-	-	-
Stage 2	121	254	-	420	589	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	321	299	844	345	302	902	1217	-	-	1313	-	-
Stage 1	462	494	-	736	701	-	-	-	-	-	-	-
Stage 2	870	696	-	581	494	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	263	844	311	266	902	1217	-	-	1313	-	-
Mov Cap-2 Maneuver	256	263	-	311	266	-	-	-	-	-	-	-
Stage 1	461	436	-	735	700	-	-	-	-	-	-	-
Stage 2	764	695	-	509	436	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	11	0.1	2.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1217	-	-	337	723	1313	-	-
HCM Lane V/C Ratio	0.002	-	-	0.019	0.173	0.095	-	-
HCM Control Delay (s)	8	0	-	15.9	11	8	0.3	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.3	-	-

Intersection						
Int Delay, s/veh	4.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	140	85	215	280	85
Future Vol, veh/h	85	140	85	215	280	85
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	92	152	92	234	304	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	651	198	396	0	-	0
Stage 1	350	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	401	810	1159	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	810	1159	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1159	-	365	810	-	-
HCM Lane V/C Ratio	0.08	-	0.253	0.188	-	-
HCM Control Delay (s)	8.4	0.2	18.2	10.5	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	0.7	-	-

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	38	11	11	98	343	22	305
v/c Ratio	0.32	0.11	0.05	0.03	0.34	0.13	0.12	0.14
Control Delay	21.8	0.6	17.6	0.2	22.0	4.7	23.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.6	17.6	0.2	22.0	4.7	23.1	7.2
Queue Length 50th (ft)	19	0	3	0	25	14	6	20
Queue Length 95th (ft)	50	0	13	0	62	53	24	47
Internal Link Dist (ft)	476		490			638		401
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	538	673	538	673	357	2618	188	2152
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	0.14	0.06	0.02	0.02	0.27	0.13	0.12	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	0	35	10	0	10	90	295	20	20	205	75
Future Volume (veh/h)	70	0	35	10	0	10	90	295	20	20	205	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	0	38	11	0	11	98	321	22	22	223	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	0	337	151	0	337	134	1632	111	47	1115	398
Arrive On Green	0.21	0.00	0.21	0.21	0.00	0.21	0.08	0.48	0.48	0.03	0.43	0.43
Sat Flow, veh/h	14	0	1585	14	0	1585	1781	3376	230	1781	2566	916
Grp Volume(v), veh/h	76	0	38	11	0	11	98	168	175	22	152	153
Grp Sat Flow(s),veh/h/ln	14	0	1585	14	0	1585	1781	1777	1829	1781	1777	1705
Q Serve(g_s), s	0.1	0.0	0.9	0.1	0.0	0.3	2.6	2.6	2.7	0.6	2.6	2.7
Cycle Q Clear(g_c), s	10.3	0.0	0.9	10.3	0.0	0.3	2.6	2.6	2.7	0.6	2.6	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.54
Lane Grp Cap(c), veh/h	151	0	337	151	0	337	134	859	884	47	772	741
V/C Ratio(X)	0.50	0.00	0.11	0.07	0.00	0.03	0.73	0.20	0.20	0.47	0.20	0.21
Avail Cap(c_a), veh/h	373	0	587	368	0	587	348	859	884	183	772	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	0.0	15.4	24.3	0.0	15.2	22.0	7.2	7.2	23.3	8.5	8.5
Incr Delay (d2), s/veh	2.6	0.0	0.1	0.2	0.0	0.0	7.4	0.5	0.5	7.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.3	0.1	0.0	0.1	1.2	0.8	0.8	0.3	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	15.6	24.5	0.0	15.2	29.4	7.7	7.7	30.4	9.1	9.2
LnGrp LOS	C	A	B	C	A	B	C	A	A	C	A	A
Approach Vol, veh/h		114			22			441			327	
Approach Delay, s/veh		23.1			19.9			12.5			10.6	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	28.0		14.9	8.2	25.6		14.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	9.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	4.7		12.3	4.6	4.7		12.3				
Green Ext Time (p_c), s	0.0	1.7		0.2	0.1	1.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			13.3
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	38	33	76	163	33	321	109	141	27
v/c Ratio	0.17	0.04	0.23	0.18	0.15	0.45	0.21	0.12	0.03
Control Delay	31.2	0.1	25.9	0.5	31.3	17.9	27.0	14.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	0.1	25.9	0.5	31.3	17.9	27.0	14.0	0.0
Queue Length 50th (ft)	7	0	13	0	6	49	9	10	0
Queue Length 95th (ft)	55	0	85	0	50	240	59	109	0
Internal Link Dist (ft)		759				560		638	
Turn Bay Length (ft)	80				350		320		
Base Capacity (vph)	225	1339	540	883	225	1439	523	1511	1311
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	0.17	0.02	0.14	0.18	0.15	0.22	0.21	0.09	0.02

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	30	70	0	150	30	225	70	100	130	25
Future Volume (veh/h)	35	0	30	70	0	150	30	225	70	100	130	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	0	33	76	0	163	33	245	76	109	141	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	0	198	132	290	392	69	365	113	318	598	507
Arrive On Green	0.04	0.00	0.13	0.07	0.00	0.16	0.04	0.27	0.27	0.09	0.32	0.32
Sat Flow, veh/h	1781	0	1585	1781	1870	1585	1781	1369	425	3456	1870	1585
Grp Volume(v), veh/h	38	0	33	76	0	163	33	0	321	109	141	27
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	1585	1781	0	1794	1728	1870	1585
Q Serve(g_s), s	0.8	0.0	0.7	1.5	0.0	3.1	0.7	0.0	5.8	1.1	2.0	0.4
Cycle Q Clear(g_c), s	0.8	0.0	0.7	1.5	0.0	3.1	0.7	0.0	5.8	1.1	2.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	78	0	198	132	290	392	69	0	478	318	598	507
V/C Ratio(X)	0.49	0.00	0.17	0.58	0.00	0.42	0.47	0.00	0.67	0.34	0.24	0.05
Avail Cap(c_a), veh/h	246	0	1359	591	1965	1811	246	0	1736	573	1862	1578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	14.1	16.2	0.0	11.4	17.0	0.0	11.8	15.4	9.1	8.5
Incr Delay (d2), s/veh	4.6	0.0	0.4	4.0	0.0	0.7	5.0	0.0	1.6	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.2	0.6	0.0	0.9	0.3	0.0	1.8	0.4	0.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	14.5	20.2	0.0	12.1	22.0	0.0	13.5	16.0	9.3	8.6
LnGrp LOS	C	A	B	C	A	B	C	A	B	B	A	A
Approach Vol, veh/h		71			239			354			277	
Approach Delay, s/veh		18.3			14.7			14.3			11.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	13.6	6.7	8.5	5.4	15.6	5.6	9.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	3.1	7.8	3.5	2.7	2.7	4.0	2.8	5.1
Green Ext Time (p_c), s	0.1	1.9	0.1	0.1	0.0	0.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	80	120	105	110	30
Future Vol, veh/h	50	80	120	105	110	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	87	130	114	120	33
Number of Lanes	1	1	1	1	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	8.6	8.4	9.3
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	105	50	80	110	30
LT Vol	0	0	50	0	110	0
Through Vol	120	0	0	0	0	30
RT Vol	0	105	0	80	0	0
Lane Flow Rate	130	114	54	87	120	33
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.183	0.138	0.09	0.115	0.187	0.046
Departure Headway (Hd)	5.057	4.353	5.977	4.772	5.62	5.117
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	710	823	599	750	638	700
Service Time	2.784	2.081	3.711	2.506	3.352	2.849
HCM Lane V/C Ratio	0.183	0.139	0.09	0.116	0.188	0.047
HCM Control Delay	8.9	7.8	9.3	8.1	9.6	8.1
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.7	0.5	0.3	0.4	0.7	0.1

Intersection						
Int Delay, s/veh	6.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	250	420	80	185	320
Future Vol, veh/h	15	250	420	80	185	320
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	5
Mvmt Flow	16	272	457	87	201	348

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1275	513	0	0	556	0
Stage 1	513	-	-	-	-	-
Stage 2	762	-	-	-	-	-
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	184	561	-	-	1015	-
Stage 1	601	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	555	-	-	1003	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	365	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.3	0	3.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	478	1003	-
HCM Lane V/C Ratio	-	-	0.603	0.2	-
HCM Control Delay (s)	-	-	23.3	9.5	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.9	0.7	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	315	87	310	239	452	33	282
v/c Ratio	0.48	0.69	0.41	0.70	0.67	0.57	0.21	0.69
Control Delay	41.2	33.3	41.5	37.3	42.7	23.2	41.2	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	33.3	41.5	37.3	42.7	23.2	41.2	37.0
Queue Length 50th (ft)	50	122	39	132	102	133	15	118
Queue Length 95th (ft)	121	250	98	264	#278	365	50	238
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	430	709	430	727	430	831	430	704
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	0.27	0.44	0.20	0.43	0.56	0.54	0.08	0.40

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 (veh/h)	105	185	105	80	260	25	220	340	75	30	220	40
Future Volume (veh/h)	105	185	105	80	260	25	220	340	75	30	220	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	114	201	114	87	283	27	239	370	82	33	239	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	148	282	160	119	398	38	294	525	116	64	339	61
Arrive On Green	0.08	0.25	0.25	0.07	0.24	0.24	0.16	0.35	0.35	0.04	0.23	0.23
Sat Flow, veh/h	1781	1112	630	1781	1677	160	1781	1479	328	1781	1501	270
Grp Volume(v), veh/h	114	0	315	87	0	310	239	0	452	33	0	282
Grp Sat Flow(s),veh/h/ln	1781	0	1742	1781	0	1837	1781	0	1806	1781	0	1771
Q Serve(g_s), s	3.5	0.0	9.1	2.7	0.0	8.6	7.2	0.0	11.9	1.0	0.0	8.1
Cycle Q Clear(g_c), s	3.5	0.0	9.1	2.7	0.0	8.6	7.2	0.0	11.9	1.0	0.0	8.1
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.18	1.00		0.15
Lane Grp Cap(c), veh/h	148	0	442	119	0	436	294	0	641	64	0	400
V/C Ratio(X)	0.77	0.00	0.71	0.73	0.00	0.71	0.81	0.00	0.70	0.52	0.00	0.70
Avail Cap(c_a), veh/h	515	0	818	515	0	863	515	0	848	515	0	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	18.8	25.4	0.0	19.4	22.3	0.0	15.4	26.2	0.0	19.7
Incr Delay (d2), s/veh	3.2	0.0	0.8	3.3	0.0	0.8	2.1	0.0	0.9	2.4	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	3.4	1.2	0.0	3.4	2.9	0.0	4.4	0.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	19.6	28.6	0.0	20.2	24.4	0.0	16.3	28.6	0.0	20.6
LnGrp LOS	C	A	B	C	A	C	C	A	B	C	A	C
Approach Vol, veh/h		429			397			691			315	
Approach Delay, s/veh		21.9			22.0			19.1			21.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	23.7	7.7	18.0	13.1	16.5	8.6	17.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.0	13.9	4.7	11.1	9.2	10.1	5.5	10.6
Green Ext Time (p_c), s	0.0	1.5	0.1	1.1	0.2	1.0	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	370	125	10	490	10	95	5	30	0	0	25
Future Vol, veh/h	80	370	125	10	490	10	95	5	30	0	0	25
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	402	136	11	533	11	103	5	33	0	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	550	0	0	540	0	0	1230	1218	479	1237	1281	555
Stage 1	-	-	-	-	-	-	646	646	-	567	567	-
Stage 2	-	-	-	-	-	-	584	572	-	670	714	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1020	-	-	1028	-	-	154	181	587	153	166	531
Stage 1	-	-	-	-	-	-	460	467	-	508	507	-
Stage 2	-	-	-	-	-	-	498	504	-	446	435	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1014	-	-	1026	-	-	129	155	582	124	142	523
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	155	-	124	142	-
Stage 1	-	-	-	-	-	-	402	408	-	442	496	-
Stage 2	-	-	-	-	-	-	461	493	-	361	380	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0.2	102.7	12.3
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	158	1014	-	-	1026	-	-	523
HCM Lane V/C Ratio	0.894	0.086	-	-	0.011	-	-	0.052
HCM Control Delay (s)	102.7	8.9	0	-	8.5	0	-	12.3
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	6.3	0.3	-	-	0	-	-	0.2

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	429	71	478	114	5	60	82	93
v/c Ratio	0.20	0.53	0.29	0.58	0.15	0.03	0.26	0.32	0.20
Control Delay	29.2	17.5	29.0	17.5	4.9	29.4	22.4	29.0	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	17.5	29.0	17.5	4.9	29.4	22.4	29.0	16.2
Queue Length 50th (ft)	15	116	24	130	3	2	13	28	18
Queue Length 95th (ft)	45	244	64	267	32	12	48	71	62
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	585	999	585	1009	885	585	938	585	932
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	0.07	0.43	0.12	0.47	0.13	0.01	0.06	0.14	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	390	5	65	440	105	5	35	20	75	55	30
Future Volume (veh/h)	40	390	5	65	440	105	5	35	20	75	55	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	43	424	5	71	478	114	5	38	22	82	60	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	84	576	7	121	622	526	12	163	94	132	241	132
Arrive On Green	0.05	0.31	0.31	0.07	0.33	0.33	0.01	0.15	0.15	0.07	0.22	0.22
Sat Flow, veh/h	1781	1845	22	1781	1870	1580	1781	1077	624	1781	1102	606
Grp Volume(v), veh/h	43	0	429	71	478	114	5	0	60	82	0	93
Grp Sat Flow(s),veh/h/ln	1781	0	1866	1781	1870	1580	1781	0	1701	1781	0	1708
Q Serve(g_s), s	1.0	0.0	8.3	1.6	9.3	2.1	0.1	0.0	1.3	1.8	0.0	1.8
Cycle Q Clear(g_c), s	1.0	0.0	8.3	1.6	9.3	2.1	0.1	0.0	1.3	1.8	0.0	1.8
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.37	1.00		0.35
Lane Grp Cap(c), veh/h	84	0	583	121	622	526	12	0	257	132	0	373
V/C Ratio(X)	0.51	0.00	0.74	0.59	0.77	0.22	0.42	0.00	0.23	0.62	0.00	0.25
Avail Cap(c_a), veh/h	703	0	1197	703	1200	1014	703	0	1091	703	0	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	12.5	18.3	12.1	9.7	20.1	0.0	15.1	18.2	0.0	13.1
Incr Delay (d2), s/veh	1.8	0.0	0.7	1.7	0.8	0.1	8.3	0.0	0.2	1.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8	0.6	3.1	0.6	0.1	0.0	0.4	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	0.0	13.1	20.0	12.9	9.8	28.3	0.0	15.3	20.0	0.0	13.2
LnGrp LOS	C	A	B	C	B	A	C	A	B	B	A	B
Approach Vol, veh/h		472			663			65			175	
Approach Delay, s/veh		13.8			13.1			16.3			16.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	16.7	7.0	10.1	5.9	17.5	4.3	12.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.6	10.3	3.8	3.3	3.0	11.3	2.1	3.8
Green Ext Time (p_c), s	0.1	1.6	0.1	0.1	0.0	1.9	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.9
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	180	35	5	175	135	50	105	15	90	50	65
Future Vol, veh/h	60	180	35	5	175	135	50	105	15	90	50	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	196	38	5	190	147	54	114	16	98	54	71
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	14.1	12.4	12.2	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	88%	0%	84%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	12%	0%	16%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	120	60	215	5	175	135	90	50	65
LT Vol	50	0	60	0	5	0	0	90	0	0
Through Vol	0	105	0	180	0	175	0	0	50	0
RT Vol	0	15	0	35	0	0	135	0	0	65
Lane Flow Rate	54	130	65	234	5	190	147	98	54	71
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.118	0.262	0.135	0.444	0.011	0.366	0.254	0.211	0.11	0.129
Departure Headway (Hd)	7.822	7.226	7.453	6.832	7.414	6.931	6.222	7.768	7.261	6.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	458	497	483	530	483	521	580	463	493	547
Service Time	5.567	4.97	5.167	4.546	5.153	4.646	3.937	5.512	5.004	4.293
HCM Lane V/C Ratio	0.118	0.262	0.135	0.442	0.01	0.365	0.253	0.212	0.11	0.13
HCM Control Delay	11.6	12.5	11.3	14.9	10.2	13.6	11	12.6	10.9	10.3
HCM Lane LOS	B	B	B	B	B	B	B	B	B	B
HCM 95th-tile Q	0.4	1	0.5	2.3	0	1.7	1	0.8	0.4	0.4

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	55	0	20	75	5	0	10	10	0	35	10
Future Vol, veh/h	0	55	0	20	75	5	0	10	10	0	35	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	0	22	82	5	0	11	11	0	38	11
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	7.5	7.8	7.4	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	20%	0%
Vol Thru, %	100%	0%	100%	75%	78%
Vol Right, %	0%	100%	0%	5%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	10	55	100	45
LT Vol	0	0	0	20	0
Through Vol	10	0	55	75	35
RT Vol	0	10	0	5	10
Lane Flow Rate	11	11	60	109	49
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.015	0.013	0.069	0.124	0.057
Departure Headway (Hd)	4.854	4.152	4.139	4.111	4.211
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	728	848	857	865	838
Service Time	2.647	1.945	2.205	2.167	2.301
HCM Lane V/C Ratio	0.015	0.013	0.07	0.126	0.058
HCM Control Delay	7.7	7	7.5	7.8	7.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0	0.2	0.4	0.2

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	35	30	0	25	0	15	230	0	0	95	30
Future Vol, veh/h	55	35	30	0	25	0	15	230	0	0	95	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	60	38	33	0	27	0	16	250	0	0	103	33
Number of Lanes	1	1	0	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	9	9	9.2	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	16%	0%	100%	0%	0%	0%	0%
Vol Thru, %	84%	100%	0%	54%	100%	100%	51%
Vol Right, %	0%	0%	0%	46%	0%	0%	49%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	92	153	55	65	25	63	62
LT Vol	15	0	55	0	0	0	0
Through Vol	77	153	0	35	25	63	32
RT Vol	0	0	0	30	0	0	30
Lane Flow Rate	100	167	60	71	27	69	67
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.143	0.238	0.1	0.102	0.043	0.101	0.091
Departure Headway (Hd)	5.181	5.15	6.037	5.209	5.68	5.283	4.889
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	691	697	593	686	628	677	731
Service Time	2.915	2.884	3.782	2.954	3.734	3.023	2.629
HCM Lane V/C Ratio	0.145	0.24	0.101	0.103	0.043	0.102	0.092
HCM Control Delay	8.8	9.5	9.5	8.5	9	8.6	8.1
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.9	0.3	0.3	0.1	0.3	0.3

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	158	21	33	33	250	11	326
v/c Ratio	0.33	0.36	0.07	0.08	0.13	0.12	0.05	0.15
Control Delay	18.1	6.1	14.6	0.4	19.1	6.2	19.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	6.1	14.6	0.4	19.1	6.2	19.3	6.4
Queue Length 50th (ft)	17	0	4	0	6	10	2	13
Queue Length 95th (ft)	56	36	19	0	30	44	15	57
Internal Link Dist (ft)	429		461			636		303
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	647	823	653	797	275	2171	233	2150
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	0.14	0.19	0.03	0.04	0.12	0.12	0.05	0.15

Intersection Summary

HCM 6th Signalized Intersection Summary
9: First St & Valley Glen Dr/Heritage Ln

03/31/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	0	145	15	5	30	30	220	10	10	275	25
Future Volume (veh/h)	85	0	145	15	5	30	30	220	10	10	275	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	0	158	16	5	33	33	239	11	11	299	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	0	557	114	21	557	64	1354	62	25	1218	109
Arrive On Green	0.35	0.00	0.35	0.35	0.35	0.35	0.04	0.39	0.39	0.01	0.37	0.37
Sat Flow, veh/h	0	0	1585	0	60	1585	1781	3460	159	1781	3298	296
Grp Volume(v), veh/h	92	0	158	21	0	33	33	122	128	11	160	166
Grp Sat Flow(s),veh/h/ln	0	0	1585	60	0	1585	1781	1777	1842	1781	1777	1817
Q Serve(g_s), s	0.0	0.0	4.0	0.0	0.0	0.8	1.0	2.5	2.5	0.3	3.5	3.5
Cycle Q Clear(g_c), s	19.5	0.0	4.0	19.5	0.0	0.8	1.0	2.5	2.5	0.3	3.5	3.5
Prop In Lane	1.00		1.00	0.76		1.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	130	0	557	135	0	557	64	695	721	25	656	671
V/C Ratio(X)	0.71	0.00	0.28	0.16	0.00	0.06	0.52	0.18	0.18	0.44	0.24	0.25
Avail Cap(c_a), veh/h	130	0	557	135	0	557	209	695	721	177	656	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	13.0	15.0	0.0	11.9	26.3	11.0	11.0	27.1	12.1	12.1
Incr Delay (d2), s/veh	16.3	0.0	0.3	0.5	0.0	0.0	6.3	0.6	0.5	11.6	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	1.3	0.2	0.0	0.2	0.5	0.9	0.9	0.2	1.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	13.2	15.5	0.0	12.0	32.6	11.6	11.6	38.8	13.0	13.0
LnGrp LOS	D	A	B	B	A	B	C	B	B	D	B	B
Approach Vol, veh/h		250			54			283			337	
Approach Delay, s/veh		24.6			13.4			14.0			13.9	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	26.2		24.0	6.5	25.0		24.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	21.5		19.5	6.5	20.5		19.5				
Max Q Clear Time (g_c+I1), s	2.3	4.5		21.5	3.0	5.5		21.5				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	1.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			16.8
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	49	81	98	5	120	5	239	223	245	16
v/c Ratio	0.15	0.21	0.29	0.01	0.17	0.02	0.46	0.44	0.24	0.02
Control Delay	26.1	9.0	26.1	15.2	3.7	30.4	19.3	29.9	15.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	9.0	26.1	15.2	3.7	30.4	19.3	29.9	15.1	0.1
Queue Length 50th (ft)	13	4	24	1	0	1	45	29	39	0
Queue Length 95th (ft)	#69	34	97	8	22	14	162	#130	187	0
Internal Link Dist (ft)		776		790			528		636	
Turn Bay Length (ft)	80					350		320		
Base Capacity (vph)	326	1178	528	1489	714	220	1344	512	1450	1264
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	0.15	0.07	0.19	0.00	0.17	0.02	0.18	0.44	0.17	0.01

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 (veh/h)	45	15	60	90	5	110	5	120	100	205	225	15
Future Volume (veh/h)	45	15	60	90	5	110	5	120	100	205	225	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	16	65	98	5	120	5	130	109	223	245	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	96	41	168	154	300	451	12	206	172	427	628	532
Arrive On Green	0.05	0.13	0.13	0.09	0.16	0.16	0.01	0.22	0.22	0.12	0.34	0.34
Sat Flow, veh/h	1781	323	1311	1781	1870	1585	1781	940	788	3456	1870	1585
Grp Volume(v), veh/h	49	0	81	98	5	120	5	0	239	223	245	16
Grp Sat Flow(s),veh/h/ln	1781	0	1634	1781	1870	1585	1781	0	1728	1728	1870	1585
Q Serve(g_s), s	1.0	0.0	1.6	1.9	0.1	2.1	0.1	0.0	4.5	2.2	3.6	0.2
Cycle Q Clear(g_c), s	1.0	0.0	1.6	1.9	0.1	2.1	0.1	0.0	4.5	2.2	3.6	0.2
Prop In Lane	1.00		0.80	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	96	0	209	154	300	451	12	0	378	427	628	532
V/C Ratio(X)	0.51	0.00	0.39	0.63	0.02	0.27	0.41	0.00	0.63	0.52	0.39	0.03
Avail Cap(c_a), veh/h	247	0	1403	592	1969	1864	247	0	1676	574	1865	1580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	14.5	15.9	12.8	10.0	17.9	0.0	12.8	14.8	9.2	8.0
Incr Delay (d2), s/veh	4.2	0.0	1.2	4.3	0.0	0.3	21.1	0.0	1.7	1.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.5	0.8	0.0	0.6	0.1	0.0	1.4	0.7	1.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	15.6	20.2	12.8	10.3	39.0	0.0	14.5	15.8	9.6	8.1
LnGrp LOS	C	A	B	C	B	B	D	A	B	B	A	A
Approach Vol, veh/h		130			223			244			484	
Approach Delay, s/veh		17.6			14.7			15.0			12.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	11.9	7.1	8.6	4.2	16.1	5.9	9.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	4.2	6.5	3.9	3.6	2.1	5.6	3.0	4.1
Green Ext Time (p_c), s	0.1	1.4	0.1	0.4	0.0	1.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	3.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	145	440	80	160	630
Future Vol, veh/h	15	145	440	80	160	630
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	158	478	87	174	685

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1579	534	0	0	577	0
Stage 1	534	-	-	-	-	-
Stage 2	1045	-	-	-	-	-
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	120	546	-	-	996	-
Stage 1	588	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	97	540	-	-	985	-
Mov Cap-2 Maneuver	97	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	276	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.4	0	1.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	378	985	-
HCM Lane V/C Ratio	-	-	0.46	0.177	-
HCM Control Delay (s)	-	-	22.4	9.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.6	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	348	54	179	147	364	87	494
v/c Ratio	0.63	0.69	0.34	0.57	0.60	0.50	0.46	0.79
Control Delay	45.1	32.6	42.8	36.4	44.1	24.3	43.6	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	32.6	42.8	36.4	44.1	24.3	43.6	37.8
Queue Length 50th (ft)	77	147	26	75	70	139	41	221
Queue Length 95th (ft)	156	270	67	151	141	279	95	#494
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	368	603	368	615	368	731	368	623
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	0.44	0.58	0.15	0.29	0.40	0.50	0.24	0.79

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 (veh/h)	150	190	130	50	130	35	135	295	40	80	415	40
Future Volume (veh/h)	150	190	130	50	130	35	135	295	40	80	415	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	207	141	54	141	38	147	321	43	87	451	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	267	182	88	272	73	189	579	78	114	532	51
Arrive On Green	0.12	0.26	0.26	0.05	0.19	0.19	0.11	0.36	0.36	0.06	0.32	0.32
Sat Flow, veh/h	1781	1028	700	1781	1410	380	1781	1612	216	1781	1679	160
Grp Volume(v), veh/h	163	0	348	54	0	179	147	0	364	87	0	494
Grp Sat Flow(s),veh/h/ln	1781	0	1728	1781	0	1790	1781	0	1828	1781	0	1839
Q Serve(g_s), s	5.3	0.0	11.2	1.8	0.0	5.4	4.8	0.0	9.5	2.9	0.0	15.0
Cycle Q Clear(g_c), s	5.3	0.0	11.2	1.8	0.0	5.4	4.8	0.0	9.5	2.9	0.0	15.0
Prop In Lane	1.00		0.41	1.00		0.21	1.00		0.12	1.00		0.09
Lane Grp Cap(c), veh/h	207	0	449	88	0	345	189	0	657	114	0	583
V/C Ratio(X)	0.79	0.00	0.77	0.61	0.00	0.52	0.78	0.00	0.55	0.76	0.00	0.85
Avail Cap(c_a), veh/h	477	0	751	477	0	778	477	0	795	477	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	20.5	27.9	0.0	21.6	26.1	0.0	15.3	27.5	0.0	19.1
Incr Delay (d2), s/veh	2.5	0.0	1.1	2.5	0.0	0.4	2.6	0.0	0.3	4.0	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	4.2	0.8	0.0	2.1	2.1	0.0	3.6	1.3	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	21.6	30.4	0.0	22.1	28.7	0.0	15.6	31.5	0.0	23.8
LnGrp LOS	C	A	C	C	A	C	C	A	B	C	A	C
Approach Vol, veh/h		511			233			511			581	
Approach Delay, s/veh		23.7			24.0			19.4			25.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	25.5	7.0	19.5	10.3	23.0	11.0	15.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	4.9	11.5	3.8	13.2	6.8	17.0	7.3	7.4
Green Ext Time (p_c), s	0.1	1.3	0.0	1.2	0.1	1.5	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	20.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	430	125	5	290	10	110	15	60	15	5	140
Future Vol, veh/h	50	430	125	5	290	10	110	15	60	15	5	140
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	467	136	5	315	11	120	16	65	16	5	152

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	332	0	0	605	0	0	1064	987	544	1028	1050	337
Stage 1	-	-	-	-	-	-	645	645	-	337	337	-
Stage 2	-	-	-	-	-	-	419	342	-	691	713	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1227	-	-	973	-	-	201	247	539	212	227	705
Stage 1	-	-	-	-	-	-	461	467	-	677	641	-
Stage 2	-	-	-	-	-	-	612	638	-	435	435	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1220	-	-	971	-	-	144	227	534	164	209	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	227	-	164	209	-
Stage 1	-	-	-	-	-	-	429	434	-	628	633	-
Stage 2	-	-	-	-	-	-	466	630	-	340	405	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	121.5	15.8
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	196	1220	-	-	971	-	-	505
HCM Lane V/C Ratio	1.026	0.045	-	-	0.006	-	-	0.344
HCM Control Delay (s)	121.5	8.1	0	-	8.7	0	-	15.8
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	9	0.1	-	-	0	-	-	1.5

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	484	65	397	120	11	114	152	180
v/c Ratio	0.25	0.61	0.30	0.49	0.16	0.07	0.43	0.50	0.33
Control Delay	33.2	23.2	33.3	19.6	4.7	33.3	31.7	33.0	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	23.2	33.3	19.6	4.7	33.3	31.7	33.0	14.8
Queue Length 50th (ft)	19	161	25	122	0	4	41	58	35
Queue Length 95th (ft)	54	#377	66	259	34	21	95	122	100
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	510	874	510	874	790	510	860	510	820
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	0.10	0.55	0.13	0.45	0.15	0.02	0.13	0.30	0.22

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 (veh/h)	45	445	0	60	365	110	10	90	15	140	75	90
Future Volume (veh/h)	45	445	0	60	365	110	10	90	15	140	75	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	484	0	65	397	120	11	98	16	152	82	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	603	0	111	624	527	25	220	36	198	183	219
Arrive On Green	0.05	0.32	0.00	0.06	0.33	0.33	0.01	0.14	0.14	0.11	0.24	0.24
Sat Flow, veh/h	1781	1870	0	1781	1870	1580	1781	1564	255	1781	771	922
Grp Volume(v), veh/h	49	484	0	65	397	120	11	0	114	152	0	180
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	1870	1580	1781	0	1819	1781	0	1693
Q Serve(g_s), s	1.2	10.4	0.0	1.6	7.9	2.4	0.3	0.0	2.5	3.7	0.0	4.0
Cycle Q Clear(g_c), s	1.2	10.4	0.0	1.6	7.9	2.4	0.3	0.0	2.5	3.7	0.0	4.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.14	1.00		0.54
Lane Grp Cap(c), veh/h	91	603	0	111	624	527	25	0	256	198	0	402
V/C Ratio(X)	0.54	0.80	0.00	0.59	0.64	0.23	0.43	0.00	0.44	0.77	0.00	0.45
Avail Cap(c_a), veh/h	647	1061	0	647	1104	933	647	0	1073	647	0	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.4	13.6	0.0	20.1	12.4	10.6	21.5	0.0	17.3	19.0	0.0	14.3
Incr Delay (d2), s/veh	1.8	1.0	0.0	1.8	0.4	0.1	4.2	0.0	0.5	2.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.7	0.0	0.6	2.7	0.7	0.1	0.0	0.9	1.5	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	14.6	0.0	21.9	12.8	10.7	25.8	0.0	17.8	21.4	0.0	14.6
LnGrp LOS	C	B	A	C	B	B	C	A	B	C	A	B
Approach Vol, veh/h		533			582			125			332	
Approach Delay, s/veh		15.3			13.4			18.5			17.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	18.2	8.9	10.2	6.3	18.7	4.6	14.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	25.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.6	12.4	5.7	4.5	3.2	9.9	2.3	6.0
Green Ext Time (p_c), s	0.0	1.7	0.1	0.3	0.0	1.6	0.0	0.6

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

Intersection	
Intersection Delay, s/veh	22.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	285	30	30	275	140	35	65	10	185	100	115
Future Vol, veh/h	140	285	30	30	275	140	35	65	10	185	100	115
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	310	33	33	299	152	38	71	11	201	109	125
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	29.5	23.2	14.7	17.3
HCM LOS	D	C	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	87%	0%	90%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	13%	0%	10%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	75	140	315	30	275	140	185	100	115
LT Vol	35	0	140	0	30	0	0	185	0	0
Through Vol	0	65	0	285	0	275	0	0	100	0
RT Vol	0	10	0	30	0	0	140	0	0	115
Lane Flow Rate	38	82	152	342	33	299	152	201	109	125
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.108	0.217	0.373	0.785	0.081	0.703	0.327	0.512	0.261	0.276
Departure Headway (Hd)	10.187	9.574	8.829	8.251	8.976	8.464	7.747	9.171	8.658	7.94
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	352	375	408	438	399	427	464	394	415	453
Service Time	7.944	7.331	6.573	5.995	6.721	6.209	5.492	6.916	6.403	5.685
HCM Lane V/C Ratio	0.108	0.219	0.373	0.781	0.083	0.7	0.328	0.51	0.263	0.276
HCM Control Delay	14.2	15	16.8	35.2	12.5	29	14.2	21.2	14.4	13.7
HCM Lane LOS	B	B	C	E	B	D	B	C	B	B
HCM 95th-tile Q	0.4	0.8	1.7	6.9	0.3	5.3	1.4	2.8	1	1.1

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	155	0	30	75	5	0	35	55	5	25	5
Future Vol, veh/h	5	155	0	30	75	5	0	35	55	5	25	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	168	0	33	82	5	0	38	60	5	27	5
Number of Lanes	0	1	0	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	8.6	8.3	7.9	8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	3%	27%	14%
Vol Thru, %	100%	0%	97%	68%	71%
Vol Right, %	0%	100%	0%	5%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	55	160	110	35
LT Vol	0	0	5	30	5
Through Vol	35	0	155	75	25
RT Vol	0	55	0	5	5
Lane Flow Rate	38	60	174	120	38
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.055	0.075	0.212	0.149	0.05
Departure Headway (Hd)	5.242	4.537	4.396	4.474	4.769
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	684	790	817	803	751
Service Time	2.964	2.259	2.414	2.493	2.795
HCM Lane V/C Ratio	0.056	0.076	0.213	0.149	0.051
HCM Control Delay	8.3	7.6	8.6	8.3	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.8	0.5	0.2

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	110	65	10	85	20	40	210	15	5	280	85
Future Vol, veh/h	75	110	65	10	85	20	40	210	15	5	280	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	82	120	71	11	92	22	43	228	16	5	304	92
Number of Lanes	1	1	0	0	1	0	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	12.2	12.1	11.6	12.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	28%	0%	100%	0%	9%	3%	0%
Vol Thru, %	72%	88%	0%	63%	74%	97%	62%
Vol Right, %	0%	12%	0%	37%	17%	0%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	120	75	175	115	145	225
LT Vol	40	0	75	0	10	5	0
Through Vol	105	105	0	110	85	140	140
RT Vol	0	15	0	65	20	0	85
Lane Flow Rate	158	130	82	190	125	158	245
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.288	0.232	0.163	0.339	0.239	0.276	0.413
Departure Headway (Hd)	6.583	6.406	7.191	6.418	6.878	6.31	6.075
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	544	558	497	557	519	567	589
Service Time	4.355	4.177	4.961	4.188	4.959	4.074	3.84
HCM Lane V/C Ratio	0.29	0.233	0.165	0.341	0.241	0.279	0.416
HCM Control Delay	12	11.1	11.4	12.5	12.1	11.5	13.1
HCM Lane LOS	B	B	B	B	B	B	B
HCM 95th-tile Q	1.2	0.9	0.6	1.5	0.9	1.1	2

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	65	11	11	141	348	22	310
v/c Ratio	0.29	0.16	0.05	0.03	0.45	0.15	0.12	0.18
Control Delay	21.8	0.8	17.9	0.1	23.0	4.9	22.9	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	0.8	17.9	0.1	23.0	4.9	22.9	7.9
Queue Length 50th (ft)	16	0	3	0	36	14	6	20
Queue Length 95th (ft)	45	0	13	0	81	52	23	46
Internal Link Dist (ft)	405		426			648		446
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	525	714	500	714	380	2395	184	1721
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	0.12	0.09	0.02	0.02	0.37	0.15	0.12	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	0	60	10	0	10	130	295	25	20	195	90
Future Volume (veh/h)	60	0	60	10	0	10	130	295	25	20	195	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	0	65	11	0	11	141	321	27	22	212	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	0	401	146	0	401	181	1520	127	46	913	407
Arrive On Green	0.25	0.00	0.25	0.25	0.00	0.25	0.10	0.46	0.46	0.03	0.38	0.38
Sat Flow, veh/h	23	0	1585	21	0	1585	1781	3320	278	1781	2390	1066
Grp Volume(v), veh/h	65	0	65	11	0	11	141	171	177	22	156	154
Grp Sat Flow(s),veh/h/ln	23	0	1585	21	0	1585	1781	1777	1820	1781	1777	1679
Q Serve(g_s), s	0.2	0.0	1.6	0.2	0.0	0.3	4.0	3.0	3.0	0.6	3.0	3.2
Cycle Q Clear(g_c), s	13.0	0.0	1.6	13.0	0.0	0.3	4.0	3.0	3.0	0.6	3.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		0.63
Lane Grp Cap(c), veh/h	146	0	401	146	0	401	181	813	833	46	679	641
V/C Ratio(X)	0.45	0.00	0.16	0.08	0.00	0.03	0.78	0.21	0.21	0.47	0.23	0.24
Avail Cap(c_a), veh/h	283	0	556	276	0	556	357	813	833	173	679	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	0.0	14.9	25.6	0.0	14.4	22.5	8.4	8.4	24.7	10.7	10.8
Incr Delay (d2), s/veh	2.1	0.0	0.2	0.2	0.0	0.0	7.0	0.6	0.6	7.3	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.5	0.1	0.0	0.1	1.8	1.0	1.0	0.3	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	0.0	15.1	25.8	0.0	14.4	29.5	8.9	8.9	32.0	11.5	11.7
LnGrp LOS	C	A	B	C	A	B	C	A	A	C	B	B
Approach Vol, veh/h		130			22			489			332	
Approach Delay, s/veh		21.4			20.1			14.9			13.0	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	28.0		17.7	9.7	24.1		17.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	23.5		18.0	10.3	18.2		18.0				
Max Q Clear Time (g_c+I1), s	2.6	5.0		15.0	6.0	5.2		15.0				
Green Ext Time (p_c), s	0.0	1.7		0.1	0.1	1.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	33	27	82	174	54	397	109	152	43
v/c Ratio	0.15	0.03	0.25	0.21	0.25	0.52	0.22	0.13	0.04
Control Delay	33.9	0.1	28.2	0.6	35.0	18.2	29.4	14.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	0.1	28.2	0.6	35.0	18.2	29.4	14.2	0.1
Queue Length 50th (ft)	7	0	15	0	11	66	10	21	0
Queue Length 95th (ft)	52	0	96	0	#93	302	63	115	0
Internal Link Dist (ft)		791				718		648	
Turn Bay Length (ft)	80				350		320		
Base Capacity (vph)	216	1318	518	814	216	1396	502	1460	1271
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	0.15	0.02	0.16	0.21	0.25	0.28	0.22	0.10	0.03

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 (veh/h)	30	0	25	75	0	160	50	285	80	100	140	40
Future Volume (veh/h)	30	0	25	75	0	160	50	285	80	100	140	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	0	27	82	0	174	54	310	87	109	152	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	0	187	134	290	386	101	433	121	307	636	539
Arrive On Green	0.04	0.00	0.12	0.08	0.00	0.15	0.06	0.31	0.31	0.09	0.34	0.34
Sat Flow, veh/h	1781	0	1585	1781	1870	1585	1781	1405	394	3456	1870	1585
Grp Volume(v), veh/h	33	0	27	82	0	174	54	0	397	109	152	43
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	1870	1585	1781	0	1799	1728	1870	1585
Q Serve(g_s), s	0.7	0.0	0.6	1.7	0.0	3.6	1.2	0.0	7.6	1.2	2.3	0.7
Cycle Q Clear(g_c), s	0.7	0.0	0.6	1.7	0.0	3.6	1.2	0.0	7.6	1.2	2.3	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	69	0	187	134	290	386	101	0	554	307	636	539
V/C Ratio(X)	0.48	0.00	0.14	0.61	0.00	0.45	0.53	0.00	0.72	0.36	0.24	0.08
Avail Cap(c_a), veh/h	228	0	1259	548	1821	1684	228	0	1614	531	1725	1462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	0.0	15.4	17.5	0.0	12.5	17.9	0.0	12.0	16.7	9.3	8.7
Incr Delay (d2), s/veh	5.1	0.0	0.4	4.4	0.0	0.8	4.3	0.0	1.8	0.7	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	0.8	0.0	1.1	0.5	0.0	2.4	0.4	0.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	0.0	15.8	21.9	0.0	13.4	22.2	0.0	13.7	17.4	9.4	8.8
LnGrp LOS	C	A	B	C	A	B	C	A	B	B	A	A
Approach Vol, veh/h		60			256			451			304	
Approach Delay, s/veh		20.0			16.1			14.8			12.2	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	16.0	6.9	8.6	6.2	17.3	5.5	10.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0				
Max Q Clear Time (g_c+I1), s	3.2	9.6	3.7	2.6	3.2	4.3	2.7	5.6				
Green Ext Time (p_c), s	0.1	2.4	0.1	0.1	0.0	0.9	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			14.7									
HCM 6th LOS			B									

HCM 6th TWSC
1: First St & E C St

04/27/2021

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	240	420	80	185	315
Future Vol, veh/h	15	240	420	80	185	315
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	5
Mvmt Flow	16	261	457	87	201	342

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1269	513	0	0	556	0
Stage 1	513	-	-	-	-	-
Stage 2	756	-	-	-	-	-
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	186	561	-	-	1015	-
Stage 1	601	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	145	555	-	-	1003	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	367	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.6	0	3.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	476	1003	-
HCM Lane V/C Ratio	-	-	0.582	0.2	-
HCM Control Delay (s)	-	-	22.6	9.5	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.6	0.7	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	288	92	299	179	441	38	250
v/c Ratio	0.43	0.65	0.40	0.68	0.58	0.62	0.21	0.60
Control Delay	38.5	31.1	38.5	34.3	39.2	25.8	38.7	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	31.1	38.5	34.3	39.2	25.8	38.7	32.3
Queue Length 50th (ft)	44	109	39	122	76	162	16	92
Queue Length 95th (ft)	109	223	100	243	173	#354	53	209
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	483	791	483	813	483	821	483	790
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	0.21	0.36	0.19	0.37	0.37	0.54	0.08	0.32

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 (veh/h)	95	180	85	85	245	30	165	330	75	35	200	30
Future Volume (veh/h)	95	180	85	85	245	30	165	330	75	35	200	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	103	196	92	92	266	33	179	359	82	38	217	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	137	293	138	130	393	49	230	460	105	73	348	53
Arrive On Green	0.08	0.25	0.25	0.07	0.24	0.24	0.13	0.31	0.31	0.04	0.23	0.23
Sat Flow, veh/h	1781	1195	561	1781	1627	202	1781	1469	335	1781	1543	235
Grp Volume(v), veh/h	103	0	288	92	0	299	179	0	441	38	0	250
Grp Sat Flow(s),veh/h/ln	1781	0	1756	1781	0	1829	1781	0	1804	1781	0	1778
Q Serve(g_s), s	2.8	0.0	7.2	2.5	0.0	7.2	4.8	0.0	10.9	1.0	0.0	6.2
Cycle Q Clear(g_c), s	2.8	0.0	7.2	2.5	0.0	7.2	4.8	0.0	10.9	1.0	0.0	6.2
Prop In Lane	1.00		0.32	1.00		0.11	1.00		0.19	1.00		0.13
Lane Grp Cap(c), veh/h	137	0	431	130	0	441	230	0	565	73	0	400
V/C Ratio(X)	0.75	0.00	0.67	0.71	0.00	0.68	0.78	0.00	0.78	0.52	0.00	0.62
Avail Cap(c_a), veh/h	583	0	934	583	0	973	583	0	960	583	0	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	16.6	22.2	0.0	16.8	20.6	0.0	15.3	23.0	0.0	17.1
Incr Delay (d2), s/veh	3.1	0.0	0.7	2.6	0.0	0.7	2.2	0.0	0.9	2.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.6	1.0	0.0	2.7	1.9	0.0	3.9	0.4	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	17.3	24.8	0.0	17.5	22.8	0.0	16.2	25.0	0.0	17.7
LnGrp LOS	C	A	B	C	A	B	C	A	B	C	A	B
Approach Vol, veh/h		391			391			620			288	
Approach Delay, s/veh		19.4			19.2			18.1			18.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	19.3	7.6	16.0	10.3	15.0	7.8	15.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.0	12.9	4.5	9.2	6.8	8.2	4.8	9.2
Green Ext Time (p_c), s	0.0	1.6	0.1	1.0	0.2	0.9	0.1	1.0

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	325	125	10	405	5	90	5	30	0	0	25
Future Vol, veh/h	70	325	125	10	405	5	90	5	30	0	0	25
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	353	136	11	440	5	98	5	33	0	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	491	0	0	1063	1048	430	1070	1114	459
Stage 1	-	-	-	-	-	-	575	575	-	471	471	-
Stage 2	-	-	-	-	-	-	488	473	-	599	643	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1109	-	-	1072	-	-	201	228	625	199	208	602
Stage 1	-	-	-	-	-	-	503	503	-	573	560	-
Stage 2	-	-	-	-	-	-	561	558	-	488	468	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1103	-	-	1070	-	-	174	201	620	167	184	593
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	201	-	167	184	-
Stage 1	-	-	-	-	-	-	453	453	-	515	549	-
Stage 2	-	-	-	-	-	-	523	547	-	410	422	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	48.1	11.4
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	212	1103	-	-	1070	-	-	593
HCM Lane V/C Ratio	0.641	0.069	-	-	0.01	-	-	0.046
HCM Control Delay (s)	48.1	8.5	0	-	8.4	0	-	11.4
HCM Lane LOS	E	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	3.8	0.2	-	-	0	-	-	0.1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	413	49	424	92	11	93	87	92
v/c Ratio	0.16	0.61	0.19	0.56	0.13	0.05	0.32	0.30	0.17
Control Delay	28.2	19.8	27.9	17.1	4.1	28.9	22.3	27.3	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	19.8	27.9	17.1	4.1	28.9	22.3	27.3	13.6
Queue Length 50th (ft)	12	113	15	78	0	3	20	26	13
Queue Length 95th (ft)	42	237	50	241	25	19	67	75	58
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	680	1097	680	1119	970	680	1033	680	1015
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	0.06	0.38	0.07	0.38	0.09	0.02	0.09	0.13	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	375	5	45	390	85	10	55	30	80	50	35
Future Volume (veh/h)	35	375	5	45	390	85	10	55	30	80	50	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	38	408	5	49	424	92	11	60	33	87	54	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	77	549	7	94	575	486	26	173	95	140	219	154
Arrive On Green	0.04	0.30	0.30	0.05	0.31	0.31	0.01	0.16	0.16	0.08	0.22	0.22
Sat Flow, veh/h	1781	1844	23	1781	1870	1580	1781	1100	605	1781	992	698
Grp Volume(v), veh/h	38	0	413	49	424	92	11	0	93	87	0	92
Grp Sat Flow(s),veh/h/ln	1781	0	1866	1781	1870	1580	1781	0	1705	1781	0	1691
Q Serve(g_s), s	0.8	0.0	7.7	1.0	7.8	1.7	0.2	0.0	1.9	1.8	0.0	1.7
Cycle Q Clear(g_c), s	0.8	0.0	7.7	1.0	7.8	1.7	0.2	0.0	1.9	1.8	0.0	1.7
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.35	1.00		0.41
Lane Grp Cap(c), veh/h	77	0	556	94	575	486	26	0	268	140	0	374
V/C Ratio(X)	0.49	0.00	0.74	0.52	0.74	0.19	0.43	0.00	0.35	0.62	0.00	0.25
Avail Cap(c_a), veh/h	737	0	1255	737	1258	1062	737	0	1147	737	0	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	12.2	17.8	12.0	9.8	18.9	0.0	14.5	17.3	0.0	12.4
Incr Delay (d2), s/veh	1.8	0.0	0.7	1.6	0.7	0.1	4.2	0.0	0.3	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.6	0.4	2.6	0.5	0.1	0.0	0.6	0.7	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	0.0	13.0	19.5	12.7	9.9	23.0	0.0	14.8	18.9	0.0	12.5
LnGrp LOS	B	A	B	B	B	A	C	A	B	B	A	B
Approach Vol, veh/h		451			565			104			179	
Approach Delay, s/veh		13.6			12.8			15.7			15.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	15.5	7.0	10.1	5.7	15.9	4.6	12.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	3.0	9.7	3.8	3.9	2.8	9.8	2.2	3.7				
Green Ext Time (p_c), s	0.0	1.5	0.1	0.3	0.0	1.7	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			13.7									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	165	50	10	145	125	70	140	15	80	70	65
Future Vol, veh/h	60	165	50	10	145	125	70	140	15	80	70	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	65	179	54	11	158	136	76	152	16	87	76	71
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	14.5	12.3	13.1	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	90%	0%	77%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	10%	0%	23%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	155	60	215	10	145	125	80	70	65
LT Vol	70	0	60	0	10	0	0	80	0	0
Through Vol	0	140	0	165	0	145	0	0	70	0
RT Vol	0	15	0	50	0	0	125	0	0	65
Lane Flow Rate	76	168	65	234	11	158	136	87	76	71
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.165	0.338	0.138	0.45	0.023	0.314	0.244	0.191	0.156	0.131
Departure Headway (Hd)	7.794	7.218	7.609	6.938	7.68	7.172	6.462	7.888	7.38	6.668
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	460	499	472	519	466	501	556	456	486	538
Service Time	5.537	4.961	5.352	4.681	5.425	4.917	4.206	5.631	5.123	4.411
HCM Lane V/C Ratio	0.165	0.337	0.138	0.451	0.024	0.315	0.245	0.191	0.156	0.132
HCM Control Delay	12.1	13.6	11.6	15.3	10.6	13.2	11.3	12.5	11.5	10.4
HCM Lane LOS	B	B	B	C	B	B	B	B	B	B
HCM 95th-tile Q	0.6	1.5	0.5	2.3	0.1	1.3	1	0.7	0.5	0.4

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	75	100	5	0	75
Future Vol, veh/h	5	75	100	5	0	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	82	109	5	0	82
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	7.8	7.1
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	0%
Vol Thru, %	94%	95%	0%
Vol Right, %	0%	5%	100%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	80	105	75
LT Vol	5	0	0
Through Vol	75	100	0
RT Vol	0	5	75
Lane Flow Rate	87	114	82
Geometry Grp	1	1	1
Degree of Util (X)	0.101	0.13	0.083
Departure Headway (Hd)	4.176	4.114	3.675
Convergence, Y/N	Yes	Yes	Yes
Cap	854	867	955
Service Time	2.223	2.157	1.774
HCM Lane V/C Ratio	0.102	0.131	0.086
HCM Control Delay	7.7	7.8	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.4	0.3

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	2	0	0	25	2	200	10	25	115	2
Future Vol, veh/h	2	2	2	0	0	25	2	200	10	25	115	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	0	0	27	2	217	11	27	125	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	293	412	64	345	408	114	127	0	0	228	0	0
Stage 1	180	180	-	227	227	-	-	-	-	-	-	-
Stage 2	113	232	-	118	181	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	637	529	987	585	531	917	1457	-	-	1337	-	-
Stage 1	804	749	-	755	715	-	-	-	-	-	-	-
Stage 2	880	711	-	874	749	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	607	516	987	571	518	917	1457	-	-	1337	-	-
Mov Cap-2 Maneuver	607	516	-	571	518	-	-	-	-	-	-	-
Stage 1	802	733	-	753	714	-	-	-	-	-	-	-
Stage 2	852	710	-	850	733	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	9	0.1	1.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1457	-	-	652	917	1337	-	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.03	0.02	-	-
HCM Control Delay (s)	7.5	0	-	10.6	9	7.7	0.1	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	30	15	205	100	35
Future Vol, veh/h	55	30	15	205	100	35
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	60	33	16	223	109	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	272	74	147	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	695	973	1432	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	868	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	686	973	1432	-	-	-
Mov Cap-2 Maneuver	686	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1432	-	686	973	-	-
HCM Lane V/C Ratio	0.011	-	0.087	0.034	-	-
HCM Control Delay (s)	7.5	0	10.7	8.8	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.1	-	-

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	98	16	38	22	256	11	310
v/c Ratio	0.40	0.24	0.06	0.09	0.10	0.12	0.05	0.14
Control Delay	19.5	5.3	14.5	0.5	19.8	6.3	19.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	5.3	14.5	0.5	19.8	6.3	19.4	6.2
Queue Length 50th (ft)	21	0	3	0	4	11	2	13
Queue Length 95th (ft)	66	25	16	0	24	45	15	53
Internal Link Dist (ft)	571		510			641		426
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	635	782	582	782	228	2181	228	2173
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	0.18	0.13	0.03	0.05	0.10	0.12	0.05	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	0	90	15	0	35	20	225	10	10	265	20
Future Volume (veh/h)	105	0	90	15	0	35	20	225	10	10	265	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	0	98	16	0	38	22	245	11	11	288	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	0	552	129	0	552	46	1372	61	25	1286	98
Arrive On Green	0.35	0.00	0.35	0.35	0.00	0.35	0.03	0.40	0.40	0.01	0.38	0.38
Sat Flow, veh/h	0	0	1585	0	0	1585	1781	3464	155	1781	3347	254
Grp Volume(v), veh/h	114	0	98	16	0	38	22	125	131	11	152	158
Grp Sat Flow(s),veh/h/ln	0	0	1585	0	0	1585	1781	1777	1842	1781	1777	1825
Q Serve(g_s), s	0.0	0.0	2.4	0.0	0.0	0.9	0.7	2.6	2.6	0.3	3.2	3.3
Cycle Q Clear(g_c), s	19.5	0.0	2.4	19.5	0.0	0.9	0.7	2.6	2.6	0.3	3.2	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.14
Lane Grp Cap(c), veh/h	129	0	552	129	0	552	46	704	730	25	683	701
V/C Ratio(X)	0.89	0.00	0.18	0.12	0.00	0.07	0.48	0.18	0.18	0.44	0.22	0.23
Avail Cap(c_a), veh/h	129	0	552	129	0	552	175	704	730	175	683	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	12.7	28.0	0.0	12.2	26.9	11.0	11.0	27.4	11.6	11.6
Incr Delay (d2), s/veh	46.7	0.0	0.2	0.4	0.0	0.1	7.5	0.6	0.5	11.7	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.8	0.2	0.0	0.3	0.4	0.9	1.0	0.2	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	0.0	12.8	28.4	0.0	12.2	34.3	11.5	11.5	39.0	12.4	12.4
LnGrp LOS	E	A	B	C	A	B	C	B	B	D	B	B
Approach Vol, veh/h		212			54			278			321	
Approach Delay, s/veh		46.1			17.0			13.3			13.3	
Approach LOS		D			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	26.7		24.0	5.9	26.0		24.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	21.5		19.5	5.5	21.5		19.5
Max Q Clear Time (g_c+I1), s	2.3	4.6		21.5	2.7	5.3		21.5
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	1.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	65	120	103	22	109	27	266	179	190	49
v/c Ratio	0.13	0.30	0.32	0.06	0.24	0.13	0.52	0.37	0.20	0.05
Control Delay	24.7	9.0	27.6	17.6	4.7	31.5	20.0	30.4	15.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	9.0	27.6	17.6	4.7	31.5	20.0	30.4	15.3	0.1
Queue Length 50th (ft)	11	6	26	6	0	7	50	24	30	0
Queue Length 95th (ft)	#98	43	102	20	22	41	175	#101	145	0
Internal Link Dist (ft)		783		766			474		641	
Turn Bay Length (ft)	80					350		320		
Base Capacity (vph)	507	1108	494	1418	456	206	1249	479	1363	1196
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	0.13	0.11	0.21	0.02	0.24	0.13	0.21	0.37	0.14	0.04

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 (veh/h)	60	20	90	95	20	100	25	120	125	165	175	45
Future Volume (veh/h)	60	20	90	95	20	100	25	120	125	165	175	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	22	98	103	22	109	27	130	136	179	190	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	40	179	157	293	427	58	197	207	391	591	501
Arrive On Green	0.07	0.13	0.13	0.09	0.16	0.16	0.03	0.24	0.24	0.11	0.32	0.32
Sat Flow, veh/h	1781	299	1332	1781	1870	1585	1781	837	876	3456	1870	1585
Grp Volume(v), veh/h	65	0	120	103	22	109	27	0	266	179	190	49
Grp Sat Flow(s),veh/h/ln	1781	0	1631	1781	1870	1585	1781	0	1713	1728	1870	1585
Q Serve(g_s), s	1.3	0.0	2.6	2.1	0.4	2.0	0.6	0.0	5.2	1.8	2.9	0.8
Cycle Q Clear(g_c), s	1.3	0.0	2.6	2.1	0.4	2.0	0.6	0.0	5.2	1.8	2.9	0.8
Prop In Lane	1.00		0.82	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	117	0	219	157	293	427	58	0	404	391	591	501
V/C Ratio(X)	0.56	0.00	0.55	0.66	0.08	0.26	0.46	0.00	0.66	0.46	0.32	0.10
Avail Cap(c_a), veh/h	239	0	1355	573	1905	1793	239	0	1607	556	1805	1529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	15.1	16.5	13.4	10.7	17.7	0.0	12.9	15.5	9.7	9.0
Incr Delay (d2), s/veh	4.1	0.0	2.1	4.6	0.1	0.3	5.6	0.0	1.8	0.8	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	0.9	0.1	0.6	0.3	0.0	1.6	0.6	0.8	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	17.2	21.1	13.5	11.0	23.4	0.0	14.7	16.3	10.0	9.1
LnGrp LOS	C	A	B	C	B	B	C	A	B	B	B	A
Approach Vol, veh/h		185			234			293			418	
Approach Delay, s/veh		18.5			15.7			15.5			12.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	12.8	7.3	9.0	5.2	15.8	6.5	9.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0				
Max Q Clear Time (g_c+I1), s	3.8	7.2	4.1	4.6	2.6	4.9	3.3	4.0				
Green Ext Time (p_c), s	0.1	1.6	0.1	0.6	0.0	1.2	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	180	35	25	160	45
Future Vol, veh/h	115	180	35	25	160	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	196	38	27	174	49
Number of Lanes	1	1	1	1	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	9.3	8.3	10.5
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	25	115	180	160	45
LT Vol	0	0	115	0	160	0
Through Vol	35	0	0	0	0	45
RT Vol	0	25	0	180	0	0
Lane Flow Rate	38	27	125	196	174	49
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.059	0.037	0.202	0.25	0.285	0.073
Departure Headway (Hd)	5.589	4.882	5.813	4.609	5.894	5.39
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	637	728	616	777	609	662
Service Time	3.354	2.646	3.555	2.351	3.647	3.143
HCM Lane V/C Ratio	0.06	0.037	0.203	0.252	0.286	0.074
HCM Control Delay	8.7	7.8	10	8.9	11	8.6
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0.2	0.1	0.8	1	1.2	0.2

Intersection						
Int Delay, s/veh	3.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	145	425	80	160	635
Future Vol, veh/h	15	145	425	80	160	635
Conflicting Peds, #/hr	12	0	0	12	12	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	5
Mvmt Flow	16	158	462	87	174	690

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1568	518	0	0	561	0
Stage 1	518	-	-	-	-	-
Stage 2	1050	-	-	-	-	-
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	122	558	-	-	1010	-
Stage 1	598	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	99	552	-	-	998	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.8	0	1.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	386	998	-
HCM Lane V/C Ratio	-	-	0.451	0.174	-
HCM Control Delay (s)	-	-	21.8	9.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.6	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	305	60	184	125	364	109	494
v/c Ratio	0.55	0.61	0.34	0.57	0.53	0.53	0.49	0.75
Control Delay	41.5	29.4	41.0	35.1	41.5	25.4	41.6	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	29.4	41.0	35.1	41.5	25.4	41.6	34.0
Queue Length 50th (ft)	61	120	27	73	56	132	49	204
Queue Length 95th (ft)	132	231	72	153	124	289	112	#502
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	398	651	398	664	398	685	398	657
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	0.34	0.47	0.15	0.28	0.31	0.53	0.27	0.75

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 (veh/h)	125	170	110	55	130	40	115	295	40	100	415	40
Future Volume (veh/h)	125	170	110	55	130	40	115	295	40	100	415	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	136	185	120	60	141	43	125	321	43	109	451	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	176	254	165	96	270	82	162	547	73	142	537	51
Arrive On Green	0.10	0.24	0.24	0.05	0.20	0.20	0.09	0.34	0.34	0.08	0.33	0.33
Sat Flow, veh/h	1781	1050	681	1781	1366	417	1781	1612	216	1781	1639	156
Grp Volume(v), veh/h	136	0	305	60	0	184	125	0	364	109	0	494
Grp Sat Flow(s),veh/h/ln	1781	0	1731	1781	0	1783	1781	0	1828	1781	0	1795
Q Serve(g_s), s	4.2	0.0	9.1	1.9	0.0	5.2	3.9	0.0	9.2	3.4	0.0	14.3
Cycle Q Clear(g_c), s	4.2	0.0	9.1	1.9	0.0	5.2	3.9	0.0	9.2	3.4	0.0	14.3
Prop In Lane	1.00		0.39	1.00		0.23	1.00		0.12	1.00		0.09
Lane Grp Cap(c), veh/h	176	0	420	96	0	353	162	0	620	142	0	589
V/C Ratio(X)	0.77	0.00	0.73	0.62	0.00	0.52	0.77	0.00	0.59	0.77	0.00	0.84
Avail Cap(c_a), veh/h	507	0	801	507	0	825	507	0	846	507	0	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	0.0	19.6	26.0	0.0	20.2	25.0	0.0	15.3	25.4	0.0	17.5
Incr Delay (d2), s/veh	2.7	0.0	0.9	2.4	0.0	0.4	2.9	0.0	0.3	3.3	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	3.4	0.8	0.0	2.0	1.6	0.0	3.4	1.5	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	20.5	28.5	0.0	20.6	27.9	0.0	15.6	28.7	0.0	21.4
LnGrp LOS	C	A	C	C	A	C	C	A	B	C	A	C
Approach Vol, veh/h		441			244			489			603	
Approach Delay, s/veh		22.6			22.5			18.8			22.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	23.1	7.0	17.6	9.1	22.4	9.5	15.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	5.4	11.2	3.9	11.1	5.9	16.3	6.2	7.2
Green Ext Time (p_c), s	0.1	1.3	0.0	1.1	0.1	1.5	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	12.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	350	125	5	265	10	115	15	55	10	5	125
Future Vol, veh/h	45	350	125	5	265	10	115	15	55	10	5	125
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	380	136	5	288	11	125	16	60	11	5	136

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	305	0	0	518	0	0	932	863	457	901	926	310
Stage 1	-	-	-	-	-	-	548	548	-	310	310	-
Stage 2	-	-	-	-	-	-	384	315	-	591	616	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1256	-	-	1048	-	-	247	292	604	259	269	730
Stage 1	-	-	-	-	-	-	521	517	-	700	659	-
Stage 2	-	-	-	-	-	-	639	656	-	493	482	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1249	-	-	1046	-	-	185	272	599	210	250	719
Mov Cap-2 Maneuver	-	-	-	-	-	-	185	272	-	210	250	-
Stage 1	-	-	-	-	-	-	491	487	-	657	651	-
Stage 2	-	-	-	-	-	-	506	648	-	402	454	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	66.3	13.4
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	241	1249	-	-	1046	-	-	580
HCM Lane V/C Ratio	0.834	0.039	-	-	0.005	-	-	0.262
HCM Control Delay (s)	66.3	8	0	-	8.5	0	-	13.4
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	6.5	0.1	-	-	0	-	-	1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	467	60	370	109	22	158	163	168
v/c Ratio	0.21	0.67	0.30	0.52	0.17	0.13	0.53	0.55	0.28
Control Delay	35.7	26.5	35.7	21.5	5.2	35.7	34.0	35.6	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	26.5	35.7	21.5	5.2	35.7	34.0	35.6	15.2
Queue Length 50th (ft)	16	166	25	120	0	9	61	67	32
Queue Length 95th (ft)	48	#381	66	252	33	33	129	137	93
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	470	805	470	822	745	470	773	470	751
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	0.08	0.58	0.13	0.45	0.15	0.05	0.20	0.35	0.22

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 (veh/h)	35	430	0	55	340	100	20	125	20	150	70	85
Future Volume (veh/h)	35	430	0	55	340	100	20	125	20	150	70	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	38	467	0	60	370	109	22	136	22	163	76	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	74	587	0	104	617	521	47	247	40	211	189	229
Arrive On Green	0.04	0.31	0.00	0.06	0.33	0.33	0.03	0.16	0.16	0.12	0.25	0.25
Sat Flow, veh/h	1781	1870	0	1781	1870	1580	1781	1529	247	1781	748	905
Grp Volume(v), veh/h	38	467	0	60	370	109	22	0	158	163	0	168
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	1870	1580	1781	0	1777	1781	0	1652
Q Serve(g_s), s	1.0	10.5	0.0	1.5	7.6	2.3	0.6	0.0	3.8	4.1	0.0	3.9
Cycle Q Clear(g_c), s	1.0	10.5	0.0	1.5	7.6	2.3	0.6	0.0	3.8	4.1	0.0	3.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.14	1.00		0.55
Lane Grp Cap(c), veh/h	74	587	0	104	617	521	47	0	287	211	0	419
V/C Ratio(X)	0.51	0.80	0.00	0.58	0.60	0.21	0.46	0.00	0.55	0.77	0.00	0.40
Avail Cap(c_a), veh/h	620	1058	0	620	1058	894	620	0	1005	620	0	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	14.4	0.0	21.1	12.9	11.1	22.0	0.0	17.7	19.7	0.0	14.3
Incr Delay (d2), s/veh	2.0	1.0	0.0	1.9	0.3	0.1	2.6	0.0	0.6	2.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.8	0.0	0.6	2.7	0.7	0.2	0.0	1.4	1.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	15.4	0.0	23.0	13.2	11.2	24.7	0.0	18.4	21.9	0.0	14.5
LnGrp LOS	C	B	A	C	B	B	C	A	B	C	A	B
Approach Vol, veh/h		505			539			180			331	
Approach Delay, s/veh		16.0			13.9			19.1			18.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	18.4	9.5	11.4	5.9	19.2	5.2	15.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	3.5	12.5	6.1	5.8	3.0	9.6	2.6	5.9
Green Ext Time (p_c), s	0.0	1.6	0.1	0.5	0.0	1.5	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	24.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	150	265	45	35	255	130	50	100	15	170	140	125
Future Vol, veh/h	150	265	45	35	255	130	50	100	15	170	140	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	163	288	49	38	277	141	54	109	16	185	152	136
Number of Lanes	1	1	0	1	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	3	2
HCM Control Delay	33.1	24.1	16.9	18.2
HCM LOS	D	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	87%	0%	85%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	13%	0%	15%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	115	150	310	35	255	130	170	140	125
LT Vol	50	0	150	0	35	0	0	170	0	0
Through Vol	0	100	0	265	0	255	0	0	140	0
RT Vol	0	15	0	45	0	0	130	0	0	125
Lane Flow Rate	54	125	163	337	38	277	141	185	152	136
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.158	0.341	0.422	0.814	0.101	0.696	0.327	0.491	0.383	0.315
Departure Headway (Hd)	10.445	9.834	9.311	8.695	9.554	9.039	8.319	9.571	9.056	8.335
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	343	365	386	414	375	399	431	377	397	431
Service Time	8.225	7.613	7.075	6.459	7.319	6.804	6.083	7.337	6.822	6.1
HCM Lane V/C Ratio	0.157	0.342	0.422	0.814	0.101	0.694	0.327	0.491	0.383	0.316
HCM Control Delay	15.2	17.7	18.7	40	13.4	30.2	15.1	21.3	17.4	14.9
HCM Lane LOS	C	C	C	E	B	D	C	C	C	B
HCM 95th-tile Q	0.6	1.5	2	7.4	0.3	5.1	1.4	2.6	1.8	1.3

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	130	75	5	5	15
Future Vol, veh/h	65	130	75	5	5	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	141	82	5	5	16
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.4	7.6	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	0%	25%
Vol Thru, %	67%	94%	0%
Vol Right, %	0%	6%	75%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	195	80	20
LT Vol	65	0	5
Through Vol	130	75	0
RT Vol	0	5	15
Lane Flow Rate	212	87	22
Geometry Grp	1	1	1
Degree of Util (X)	0.242	0.099	0.025
Departure Headway (Hd)	4.103	4.092	4.182
Convergence, Y/N	Yes	Yes	Yes
Cap	873	869	861
Service Time	2.134	2.15	2.182
HCM Lane V/C Ratio	0.243	0.1	0.026
HCM Control Delay	8.4	7.6	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.3	0.1

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	2	2	2	15	0	100	2	215	15	115	315	2
Future Vol, veh/h	2	2	2	15	0	100	2	215	15	115	315	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	16	0	109	2	234	16	125	342	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	714	847	172	668	840	125	344	0	0	250	0	0
Stage 1	593	593	-	246	246	-	-	-	-	-	-	-
Stage 2	121	254	-	422	594	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
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	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	319	297	842	344	300	902	1212	-	-	1313	-	-
Stage 1	459	492	-	736	701	-	-	-	-	-	-	-
Stage 2	870	696	-	580	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	255	261	842	310	264	902	1212	-	-	1313	-	-
Mov Cap-2 Maneuver	255	261	-	310	264	-	-	-	-	-	-	-
Stage 1	458	434	-	735	700	-	-	-	-	-	-	-
Stage 2	764	695	-	508	433	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	11	0.1	2.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1212	-	-	336	722	1313	-	-
HCM Lane V/C Ratio	0.002	-	-	0.019	0.173	0.095	-	-
HCM Control Delay (s)	8	0	-	15.9	11	8	0.3	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.3	-	-

Intersection						
Int Delay, s/veh	4.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	140	85	215	280	85
Future Vol, veh/h	85	140	85	215	280	85
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	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	92	152	92	234	304	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	651	198	396	0	-	0
Stage 1	350	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	401	810	1159	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	810	1159	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1159	-	365	810	-	-
HCM Lane V/C Ratio	0.08	-	0.253	0.188	-	-
HCM Control Delay (s)	8.4	0.2	18.2	10.5	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	0.7	-	-

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	38	11	11	98	343	22	305
v/c Ratio	0.31	0.11	0.05	0.03	0.38	0.13	0.11	0.14
Control Delay	21.4	0.6	17.4	0.2	24.1	4.8	22.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	0.6	17.4	0.2	24.1	4.8	22.2	6.5
Queue Length 50th (ft)	20	0	3	0	26	14	6	20
Queue Length 95th (ft)	49	0	13	0	65	54	23	44
Internal Link Dist (ft)	398		461			637		418
Turn Bay Length (ft)				120	180		160	
Base Capacity (vph)	568	694	568	694	285	2613	209	2208
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	0.13	0.05	0.02	0.02	0.34	0.13	0.11	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	0	35	10	0	10	90	295	20	20	205	75
Future Volume (veh/h)	70	0	35	10	0	10	90	295	20	20	205	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	0	38	11	0	11	98	321	22	22	223	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	0	334	154	0	334	136	1619	110	47	1103	394
Arrive On Green	0.21	0.00	0.21	0.21	0.00	0.21	0.08	0.48	0.48	0.03	0.43	0.43
Sat Flow, veh/h	14	0	1585	14	0	1585	1781	3376	230	1781	2566	916
Grp Volume(v), veh/h	76	0	38	11	0	11	98	168	175	22	152	153
Grp Sat Flow(s),veh/h/ln	14	0	1585	14	0	1585	1781	1777	1829	1781	1777	1705
Q Serve(g_s), s	0.1	0.0	0.9	0.1	0.0	0.3	2.6	2.6	2.6	0.6	2.5	2.7
Cycle Q Clear(g_c), s	10.0	0.0	0.9	10.0	0.0	0.3	2.6	2.6	2.6	0.6	2.5	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.54
Lane Grp Cap(c), veh/h	154	0	334	154	0	334	136	852	877	47	764	733
V/C Ratio(X)	0.49	0.00	0.11	0.07	0.00	0.03	0.72	0.20	0.20	0.47	0.20	0.21
Avail Cap(c_a), veh/h	403	0	615	397	0	615	280	852	877	206	764	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	15.2	23.8	0.0	15.0	21.5	7.1	7.1	22.9	8.5	8.5
Incr Delay (d2), s/veh	2.4	0.0	0.1	0.2	0.0	0.0	7.1	0.5	0.5	7.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.3	0.1	0.0	0.1	1.2	0.8	0.8	0.3	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	15.4	24.0	0.0	15.0	28.6	7.6	7.6	29.9	9.1	9.1
LnGrp LOS	C	A	B	C	A	B	C	A	A	C	A	A
Approach Vol, veh/h		114			22			441			327	
Approach Delay, s/veh		22.6			19.5			12.3			10.5	
Approach LOS		C			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	27.4		14.6	8.1	25.0		14.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	22.5		18.5	7.5	20.5		18.5				
Max Q Clear Time (g_c+I1), s	2.6	4.6		12.0	4.6	4.7		12.0				
Green Ext Time (p_c), s	0.0	1.7		0.2	0.0	1.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			13.1									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	49	76	71	27	158	71	343	109	147	49
v/c Ratio	0.24	0.21	0.23	0.05	0.23	0.34	0.48	0.23	0.16	0.06
Control Delay	34.7	12.4	28.4	16.6	3.3	37.1	19.5	29.7	16.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	12.4	28.4	16.6	3.3	37.1	19.5	29.7	16.7	0.1
Queue Length 50th (ft)	14	7	19	5	0	20	84	15	32	0
Queue Length 95th (ft)	#77	42	81	26	30	#118	258	60	113	0
Internal Link Dist (ft)		747		742			658		637	
Turn Bay Length (ft)	80					350		320		
Base Capacity (vph)	206	1172	496	1429	686	206	1336	481	1393	1220
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	0.24	0.06	0.14	0.02	0.23	0.34	0.26	0.23	0.11	0.04

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 (veh/h)	45	25	45	65	25	145	65	250	65	100	135	45
Future Volume (veh/h)	45	25	45	65	25	145	65	250	65	100	135	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	27	49	71	27	158	71	272	71	109	147	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	80	144	124	281	382	124	396	103	313	557	472
Arrive On Green	0.05	0.13	0.13	0.07	0.15	0.15	0.07	0.28	0.28	0.09	0.30	0.30
Sat Flow, veh/h	1781	595	1080	1781	1870	1585	1781	1430	373	3456	1870	1585
Grp Volume(v), veh/h	49	0	76	71	27	158	71	0	343	109	147	49
Grp Sat Flow(s),veh/h/ln	1781	0	1676	1781	1870	1585	1781	0	1803	1728	1870	1585
Q Serve(g_s), s	1.0	0.0	1.5	1.4	0.5	3.1	1.4	0.0	6.3	1.1	2.2	0.8
Cycle Q Clear(g_c), s	1.0	0.0	1.5	1.4	0.5	3.1	1.4	0.0	6.3	1.1	2.2	0.8
Prop In Lane	1.00		0.64	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	95	0	224	124	281	382	124	0	500	313	557	472
V/C Ratio(X)	0.52	0.00	0.34	0.57	0.10	0.41	0.57	0.00	0.69	0.35	0.26	0.10
Avail Cap(c_a), veh/h	239	0	1392	573	1905	1758	239	0	1691	556	1805	1529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	14.7	16.8	13.7	11.9	16.8	0.0	12.0	15.9	10.0	9.5
Incr Delay (d2), s/veh	4.3	0.0	0.9	4.1	0.1	0.7	4.1	0.0	1.7	0.7	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.5	0.6	0.2	0.9	0.6	0.0	2.0	0.4	0.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	15.6	20.9	13.8	12.7	20.9	0.0	13.7	16.6	10.2	9.6
LnGrp LOS	C	A	B	C	B	B	C	A	B	B	B	A
Approach Vol, veh/h		125			256			414			305	
Approach Delay, s/veh		17.9			15.1			15.0			12.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	14.3	6.6	9.0	6.6	15.1	6.0	9.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	6.0	35.0	12.0	31.0	5.0	36.0	5.0	38.0
Max Q Clear Time (g_c+I1), s	3.1	8.3	3.4	3.5	3.4	4.2	3.0	5.1
Green Ext Time (p_c), s	0.1	2.0	0.1	0.4	0.0	0.9	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	14.6
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	175	120	90	180	75
Future Vol, veh/h	35	175	120	90	180	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	190	130	98	196	82
Number of Lanes	1	1	1	1	1	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	9.7	9	10.7
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	100%	0%
Vol Thru, %	100%	0%	0%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	90	35	175	180	75
LT Vol	0	0	35	0	180	0
Through Vol	120	0	0	0	0	75
RT Vol	0	90	0	175	0	0
Lane Flow Rate	130	98	38	190	196	82
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.197	0.129	0.066	0.268	0.318	0.121
Departure Headway (Hd)	5.437	4.73	6.277	5.07	5.854	5.35
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	655	751	568	704	610	665
Service Time	3.209	2.503	4.043	2.834	3.626	3.122
HCM Lane V/C Ratio	0.198	0.13	0.067	0.27	0.321	0.123
HCM Control Delay	9.6	8.2	9.5	9.7	11.4	8.9
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0.7	0.4	0.2	1.1	1.4	0.4

APPENDIX D – SYNCHRO REPORTS FOR MITIGATIONS

Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	93	233	147
Demand Flow Rate, veh/h	95	237	150
Vehicles Circulating, veh/h	111	61	16
Vehicles Exiting, veh/h	55	145	282
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.4	3.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	95	237	150
Cap Entry Lane, veh/h	1232	1297	1358
Entry HV Adj Factor	0.979	0.982	0.979
Flow Entry, veh/h	93	233	147
Cap Entry, veh/h	1206	1273	1329
V/C Ratio	0.077	0.183	0.110
Control Delay, s/veh	3.6	4.4	3.6
LOS	A	A	A
95th %tile Queue, veh	0	1	0

Intersection			
Intersection Delay, s/veh	5.8		
Intersection LOS	A		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	244	326	396
Demand Flow Rate, veh/h	249	333	404
Vehicles Circulating, veh/h	310	94	94
Vehicles Exiting, veh/h	188	465	333
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	6.1	5.3	5.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	249	333	404
Cap Entry Lane, veh/h	1006	1254	1254
Entry HV Adj Factor	0.980	0.980	0.980
Flow Entry, veh/h	244	326	396
Cap Entry, veh/h	986	1229	1229
V/C Ratio	0.248	0.266	0.322
Control Delay, s/veh	6.1	5.3	5.9
LOS	A	A	A
95th %tile Queue, veh	1	1	1

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	16	272	544	201	348
v/c Ratio	0.09	0.50	0.64	0.40	0.28
Control Delay	19.4	4.1	13.9	5.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	4.1	13.9	5.5	3.9
Queue Length 50th (ft)	4	0	101	14	27
Queue Length 95th (ft)	17	17	202	35	62
Internal Link Dist (ft)		291	630		665
Turn Bay Length (ft)	90			70	
Base Capacity (vph)	514	832	854	498	1235
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.33	0.64	0.40	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	15	0	250	0	420	80	185	320	0
Future Volume (veh/h)	0	0	0	15	0	250	0	420	80	185	320	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	0	0	0	16	0	272	0	457	87	201	348	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	0	425	0	537	0	351	132	663	126	457	1108	0
Arrive On Green	0.00	0.00	0.00	0.23	0.00	0.23	0.00	0.44	0.44	0.09	0.61	0.00
Sat Flow, veh/h	0	1870	0	1781	0	1543	1033	1523	290	1781	1826	0
Grp Volume(v), veh/h	0	0	0	16	0	272	0	0	544	201	348	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1781	0	1543	1033	0	1813	1781	1826	0
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	9.0	0.0	0.0	13.2	3.0	5.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.4	0.0	9.0	0.0	0.0	13.2	3.0	5.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	0	425	0	537	0	351	132	0	789	457	1108	0
V/C Ratio(X)	0.00	0.00	0.00	0.03	0.00	0.78	0.00	0.00	0.69	0.44	0.31	0.00
Avail Cap(c_a), veh/h	0	619	0	722	0	511	132	0	789	492	1108	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	16.4	0.0	19.7	0.0	0.0	12.4	8.7	5.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.9	0.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.1	0.0	3.3	0.0	0.0	5.5	1.0	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	16.4	0.0	24.2	0.0	0.0	17.3	9.3	5.9	0.0
LnGrp LOS	A	A	A	B	A	C	A	A	B	A	A	A
Approach Vol, veh/h		0			288			544			549	
Approach Delay, s/veh		0.0			23.8			17.3			7.2	
Approach LOS					C			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.3	28.2		16.9		37.5		16.9				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	5.9	22.6		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s	5.0	15.2		0.0		7.0		11.0				
Green Ext Time (p_c), s	0.1	2.1		0.0		2.3		1.0				

Intersection Summary			
HCM 6th Ctrl Delay			14.6
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	315	87	310	239	452	33	282
v/c Ratio	0.31	0.53	0.24	0.52	0.72	0.62	0.25	0.73
Control Delay	23.7	29.8	15.5	25.7	45.1	22.2	37.9	36.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	29.8	15.5	25.7	45.1	22.2	37.9	36.8
Queue Length 50th (ft)	42	111	24	126	101	132	15	118
Queue Length 95th (ft)	76	171	51	197	#253	271	41	177
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	365	620	360	628	332	741	130	527
Starvation Cap Reductn	0	6	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	0.31	0.51	0.24	0.49	0.72	0.61	0.25	0.54

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 (veh/h)	105	185	105	80	260	25	220	340	75	30	220	40
Future Volume (veh/h)	105	185	105	80	260	25	220	340	75	30	220	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	114	201	114	87	283	27	239	370	82	33	239	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	484	437	248	516	651	62	238	451	100	59	308	55
Arrive On Green	0.10	0.66	0.66	0.06	0.39	0.39	0.13	0.31	0.31	0.03	0.21	0.21
Sat Flow, veh/h	1781	1115	632	1781	1679	160	1781	1478	328	1781	1500	270
Grp Volume(v), veh/h	114	0	315	87	0	310	239	0	452	33	0	282
Grp Sat Flow(s),veh/h/ln	1781	0	1747	1781	0	1839	1781	0	1806	1781	0	1770
Q Serve(g_s), s	2.8	0.0	6.7	2.1	0.0	9.3	10.0	0.0	17.4	1.4	0.0	11.3
Cycle Q Clear(g_c), s	2.8	0.0	6.7	2.1	0.0	9.3	10.0	0.0	17.4	1.4	0.0	11.3
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.18	1.00		0.15
Lane Grp Cap(c), veh/h	484	0	685	516	0	713	238	0	552	59	0	363
V/C Ratio(X)	0.24	0.00	0.46	0.17	0.00	0.43	1.01	0.00	0.82	0.56	0.00	0.78
Avail Cap(c_a), veh/h	495	0	685	536	0	713	238	0	650	119	0	519
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.00	0.91	1.00	0.00	1.00	1.00	0.00	1.00	0.97	0.00	0.97
Uniform Delay (d), s/veh	12.3	0.0	9.0	12.5	0.0	16.9	32.5	0.0	24.1	35.7	0.0	28.2
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.1	0.0	0.2	60.0	0.0	6.1	3.0	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.3	0.8	0.0	3.7	8.1	0.0	7.9	0.6	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	11.0	12.6	0.0	17.1	92.5	0.0	30.2	38.7	0.0	30.8
LnGrp LOS	B	A	B	B	A	B	F	A	C	D	A	C
Approach Vol, veh/h		429			397			691			315	
Approach Delay, s/veh		11.4			16.1			51.7			31.6	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	26.9	8.2	33.4	14.0	19.4	8.5	33.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	5.0	27.0	5.0	22.0	10.0	22.0	5.0	22.0
Max Q Clear Time (g_c+I1), s	3.4	19.4	4.1	8.7	12.0	13.3	4.8	11.3
Green Ext Time (p_c), s	0.0	1.2	0.0	1.1	0.0	0.7	0.0	0.9

Intersection Summary		
HCM 6th Ctrl Delay		31.1
HCM 6th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	87	538	11	544	141	27
v/c Ratio	0.15	0.42	0.02	0.47	0.61	0.05
Control Delay	1.6	2.7	1.5	6.6	35.2	0.2
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	1.6	2.7	1.5	6.9	35.2	0.2
Queue Length 50th (ft)	2	8	1	72	52	0
Queue Length 95th (ft)	7	94	m0	30	98	0
Internal Link Dist (ft)		667		259	308	244
Turn Bay Length (ft)	80		50			
Base Capacity (vph)	591	1271	589	1168	412	702
Starvation Cap Reductn	0	0	0	182	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.42	0.02	0.55	0.34	0.04

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 (veh/h)	80	370	125	10	490	10	95	5	30	0	0	25
Future Volume (veh/h)	80	370	125	10	490	10	95	5	30	0	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.97		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	402	136	11	533	11	103	5	33	0	0	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	677	438	148	773	603	12	230	21	51	0	0	244
Arrive On Green	0.63	0.66	0.66	0.35	0.37	0.37	0.16	0.16	0.16	0.00	0.00	0.16
Sat Flow, veh/h	1781	1333	451	1781	1643	34	925	129	322	0	0	1535
Grp Volume(v), veh/h	87	0	538	11	0	544	141	0	0	0	0	27
Grp Sat Flow(s),veh/h/ln	1781	0	1784	1781	0	1677	1376	0	0	0	0	1535
Q Serve(g_s), s	0.0	0.0	19.5	0.0	0.0	22.8	6.2	0.0	0.0	0.0	0.0	1.1
Cycle Q Clear(g_c), s	0.0	0.0	19.5	0.0	0.0	22.8	7.3	0.0	0.0	0.0	0.0	1.1
Prop In Lane	1.00		0.25	1.00		0.02	0.73		0.23	0.00		1.00
Lane Grp Cap(c), veh/h	677	0	587	773	0	615	302	0	0	0	0	244
V/C Ratio(X)	0.13	0.00	0.92	0.01	0.00	0.88	0.47	0.00	0.00	0.00	0.00	0.11
Avail Cap(c_a), veh/h	677	0	856	773	0	805	490	0	0	0	0	450
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.00	0.91	0.76	0.00	0.76	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	9.3	0.0	12.0	13.2	0.0	22.3	29.6	0.0	0.0	0.0	0.0	27.0
Incr Delay (d2), s/veh	0.1	0.0	20.1	0.0	0.0	13.5	1.1	0.0	0.0	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	6.9	0.1	0.0	10.6	2.4	0.0	0.0	0.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.0	32.1	13.3	0.0	35.8	30.8	0.0	0.0	0.0	0.0	27.2
LnGrp LOS	A	A	C	B	A	D	C	A	A	A	A	C
Approach Vol, veh/h		625			555			141			27	
Approach Delay, s/veh		28.9			35.3			30.8			27.2	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	30.4	28.7		15.9	27.6	31.5		15.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	5.0	36.0		22.0	5.0	36.0		22.0
Max Q Clear Time (g_c+I1), s	2.0	21.5		3.1	2.0	24.8		9.3
Green Ext Time (p_c), s	0.0	3.1		0.1	0.0	2.7		0.6

Intersection Summary			
HCM 6th Ctrl Delay			31.7
HCM 6th LOS			C

Notes

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	429	71	478	114	5	60	82	93
v/c Ratio	0.28	0.42	0.45	0.45	0.12	0.04	0.36	0.42	0.25
Control Delay	36.4	14.2	38.6	11.0	1.6	33.6	28.3	37.1	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	14.2	38.6	11.0	1.6	33.6	28.3	37.1	18.1
Queue Length 50th (ft)	19	125	30	92	0	2	17	36	22
Queue Length 95th (ft)	47	216	#89	181	13	12	49	74	61
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	151	1019	159	1074	973	118	590	194	593
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	0.28	0.42	0.45	0.45	0.12	0.04	0.10	0.42	0.16

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 (veh/h)	40	390	5	65	440	105	5	35	20	75	55	30
Future Volume (veh/h)	40	390	5	65	440	105	5	35	20	75	55	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1826	1870	1870	1826	1870
Adj Flow Rate, veh/h	43	424	5	71	478	114	5	38	22	82	60	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	5	2
Cap, veh/h	70	482	6	664	1112	941	12	100	58	105	161	88
Arrive On Green	0.04	0.26	0.26	0.75	1.00	1.00	0.01	0.09	0.09	0.06	0.15	0.15
Sat Flow, veh/h	1781	1845	22	1781	1870	1582	1781	1073	621	1781	1100	605
Grp Volume(v), veh/h	43	0	429	71	478	114	5	0	60	82	0	93
Grp Sat Flow(s),veh/h/ln	1781	0	1866	1781	1870	1582	1781	0	1694	1781	0	1705
Q Serve(g_s), s	1.8	0.0	16.5	0.8	0.0	0.0	0.2	0.0	2.5	3.4	0.0	3.7
Cycle Q Clear(g_c), s	1.8	0.0	16.5	0.8	0.0	0.0	0.2	0.0	2.5	3.4	0.0	3.7
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.37	1.00		0.35
Lane Grp Cap(c), veh/h	70	0	488	664	1112	941	12	0	158	105	0	249
V/C Ratio(X)	0.61	0.00	0.88	0.11	0.43	0.12	0.43	0.00	0.38	0.78	0.00	0.37
Avail Cap(c_a), veh/h	119	0	597	664	1112	941	119	0	565	119	0	568
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.88	0.88	0.88	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	26.6	6.1	0.0	0.0	37.1	0.0	31.9	34.8	0.0	28.9
Incr Delay (d2), s/veh	3.2	0.0	19.7	0.0	1.1	0.2	8.8	0.0	0.6	21.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	9.6	0.3	0.3	0.1	0.1	0.0	1.0	2.1	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.0	46.3	6.1	1.1	0.2	45.9	0.0	32.5	56.3	0.0	29.3
LnGrp LOS	D	A	D	A	A	A	D	A	C	E	A	C
Approach Vol, veh/h		472			663			65			175	
Approach Delay, s/veh		45.6			1.5			33.5			41.9	
Approach LOS		D			A			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	23.6	8.4	11.0	7.0	48.6	4.5	14.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	5.0	24.0	5.0	25.0	5.0	24.0	5.0	25.0
Max Q Clear Time (g_c+I1), s	2.8	18.5	5.4	4.5	3.8	2.0	2.2	5.7
Green Ext Time (p_c), s	0.0	0.9	0.0	0.1	0.0	2.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

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

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	16	158	565	174	685
v/c Ratio	0.09	0.30	0.53	0.32	0.49
Control Delay	19.6	1.5	11.1	4.3	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	1.5	11.1	4.3	5.1
Queue Length 50th (ft)	4	0	104	12	68
Queue Length 95th (ft)	17	0	201	28	139
Internal Link Dist (ft)		291	630		665
Turn Bay Length (ft)	90			70	
Base Capacity (vph)	524	814	1058	546	1390
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.19	0.53	0.32	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	15	0	145	0	440	80	160	630	0
Future Volume (veh/h)	0	0	0	15	0	145	0	440	80	160	630	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	16	0	158	0	478	87	174	685	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	292	0	423	0	238	145	739	135	516	1240	0
Arrive On Green	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.48	0.48	0.09	0.66	0.00
Sat Flow, veh/h	0	1870	0	1781	0	1524	757	1536	280	1781	1870	0
Grp Volume(v), veh/h	0	0	0	16	0	158	0	0	565	174	685	0
Grp Sat Flow(s),veh/h/ln	0	1870	0	1781	0	1524	757	0	1816	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	4.9	0.0	0.0	11.7	2.1	9.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.4	0.0	4.9	0.0	0.0	11.7	2.1	9.7	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.15	1.00		0.00
Lane Grp Cap(c), veh/h	0	292	0	423	0	238	145	0	874	516	1240	0
V/C Ratio(X)	0.00	0.00	0.00	0.04	0.00	0.66	0.00	0.00	0.65	0.34	0.55	0.00
Avail Cap(c_a), veh/h	0	677	0	789	0	551	145	0	874	550	1240	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	17.9	0.0	19.8	0.0	0.0	9.7	6.5	4.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	3.7	0.4	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.1	0.0	1.8	0.0	0.0	4.4	0.6	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	17.9	0.0	22.9	0.0	0.0	13.4	6.9	6.2	0.0
LnGrp LOS	A	A	A	B	A	C	A	A	B	A	A	A
Approach Vol, veh/h		0			174			565			859	
Approach Delay, s/veh		0.0			22.5			13.4			6.4	
Approach LOS					C			B			A	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	9.0	28.5		12.3		37.5		12.3				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	5.5	23.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s	4.1	13.7		0.0		11.7		6.9				
Green Ext Time (p_c), s	0.1	2.6		0.0		5.2		0.7				

Intersection Summary			
HCM 6th Ctrl Delay			10.6
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	348	54	179	147	364	87	494
v/c Ratio	0.32	0.52	0.15	0.30	0.71	0.71	0.31	0.88
Control Delay	20.1	24.6	19.5	27.9	61.0	40.0	38.8	50.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	25.1	19.5	27.9	61.0	40.0	38.8	50.1
Queue Length 50th (ft)	50	113	19	82	91	214	47	291
Queue Length 95th (ft)	m113	202	47	149	#167	286	96	395
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	513	682	362	608	236	715	299	663
Starvation Cap Reductn	0	98	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	14	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.60	0.15	0.30	0.62	0.51	0.29	0.75

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 (veh/h)	150	190	130	50	130	35	135	295	40	80	415	40
Future Volume (veh/h)	150	190	130	50	130	35	135	295	40	80	415	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	207	141	54	141	38	147	321	43	87	451	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	567	421	287	461	527	142	178	364	49	298	492	47
Arrive On Green	0.12	0.68	0.68	0.04	0.37	0.37	0.10	0.23	0.23	0.17	0.29	0.29
Sat Flow, veh/h	1781	1031	702	1781	1414	381	1781	1611	216	1781	1679	160
Grp Volume(v), veh/h	163	0	348	54	0	179	147	0	364	87	0	494
Grp Sat Flow(s),veh/h/ln	1781	0	1734	1781	0	1796	1781	0	1826	1781	0	1839
Q Serve(g_s), s	5.5	0.0	9.6	1.8	0.0	6.9	8.1	0.0	19.3	4.3	0.0	26.0
Cycle Q Clear(g_c), s	5.5	0.0	9.6	1.8	0.0	6.9	8.1	0.0	19.3	4.3	0.0	26.0
Prop In Lane	1.00		0.41	1.00		0.21	1.00		0.12	1.00		0.09
Lane Grp Cap(c), veh/h	567	0	707	461	0	669	178	0	413	298	0	539
V/C Ratio(X)	0.29	0.00	0.49	0.12	0.00	0.27	0.83	0.00	0.88	0.29	0.00	0.92
Avail Cap(c_a), veh/h	595	0	707	481	0	669	232	0	712	298	0	662
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.00	0.87	1.00	0.00	1.00	1.00	0.00	1.00	0.87	0.00	0.87
Uniform Delay (d), s/veh	15.5	0.0	11.0	18.1	0.0	21.9	44.2	0.0	37.4	36.5	0.0	34.1
Incr Delay (d2), s/veh	0.1	0.0	2.1	0.0	0.0	0.1	13.5	0.0	3.1	0.2	0.0	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.3	0.8	0.0	2.9	4.2	0.0	8.8	1.9	0.0	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	0.0	13.1	18.1	0.0	22.0	57.7	0.0	40.5	36.6	0.0	46.8
LnGrp LOS	B	A	B	B	A	C	E	A	D	D	A	D
Approach Vol, veh/h		511			233			511			581	
Approach Delay, s/veh		13.9			21.1			45.4			45.3	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.7	26.6	7.9	44.8	14.0	33.3	11.4	41.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	10.0	39.0	5.0	30.0	13.0	36.0	9.0	26.0				
Max Q Clear Time (g_c+I1), s	6.3	21.3	3.8	11.6	10.1	28.0	7.5	8.9				
Green Ext Time (p_c), s	0.0	1.3	0.0	1.4	0.1	1.4	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			33.5									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	54	603	5	326	201	173
v/c Ratio	0.08	0.48	0.01	0.28	0.90	0.40
Control Delay	4.1	5.6	6.0	14.5	71.1	9.5
Queue Delay	0.0	0.0	0.0	0.9	0.0	0.0
Total Delay	4.1	5.6	6.0	15.4	71.1	9.5
Queue Length 50th (ft)	1	1	2	175	111	11
Queue Length 95th (ft)	m19	132	m3	m164	#183	59
Internal Link Dist (ft)		667		259	308	244
Turn Bay Length (ft)	80		50			
Base Capacity (vph)	696	1251	528	1173	306	549
Starvation Cap Reductn	0	0	0	574	0	0
Spillback Cap Reductn	0	9	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.49	0.01	0.54	0.66	0.32

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 (veh/h)	50	430	125	5	290	10	110	15	60	15	5	140
Future Volume (veh/h)	50	430	125	5	290	10	110	15	60	15	5	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.97	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	467	136	5	315	11	120	16	65	16	5	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	748	950	277	614	1169	41	186	30	76	55	23	276
Arrive On Green	0.08	1.00	1.00	0.01	0.65	0.65	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1781	1390	405	1781	1796	63	675	155	397	81	119	1451
Grp Volume(v), veh/h	54	0	603	5	0	326	201	0	0	173	0	0
Grp Sat Flow(s),veh/h/ln	1781	0	1795	1781	0	1859	1226	0	0	1651	0	0
Q Serve(g_s), s	0.9	0.0	0.0	0.1	0.0	7.4	6.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.1	0.0	7.4	16.2	0.0	0.0	9.9	0.0	0.0
Prop In Lane	1.00		0.23	1.00		0.03	0.60		0.32	0.09		0.88
Lane Grp Cap(c), veh/h	748	0	1226	614	0	1209	291	0	0	354	0	0
V/C Ratio(X)	0.07	0.00	0.49	0.01	0.00	0.27	0.69	0.00	0.00	0.49	0.00	0.00
Avail Cap(c_a), veh/h	768	0	1226	691	0	1209	425	0	0	506	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.00	0.84	0.87	0.00	0.87	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.8	0.0	0.0	5.9	0.0	7.4	39.5	0.0	0.0	36.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.0	0.0	0.5	2.9	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.0	0.0	2.9	5.0	0.0	0.0	3.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.8	0.0	1.2	5.9	0.0	7.9	42.4	0.0	0.0	37.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h		657			331			201			173	
Approach Delay, s/veh		1.5			7.8			42.4			37.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.6	72.3		23.0	7.9	69.1		23.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	5.0	54.0		29.0	5.0	54.0		29.0
Max Q Clear Time (g_c+I1), s	2.1	2.0		11.9	2.9	9.4		18.2
Green Ext Time (p_c), s	0.0	4.9		0.9	0.0	2.2		0.9

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	484	65	397	120	11	114	152	180
v/c Ratio	0.38	0.47	0.45	0.38	0.13	0.11	0.59	0.70	0.39
Control Delay	51.9	18.4	55.9	11.1	1.3	47.3	51.6	58.6	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	18.4	55.9	11.1	1.3	47.3	51.6	58.6	21.8
Queue Length 50th (ft)	30	187	43	85	0	7	66	94	57
Queue Length 95th (ft)	66	342	m74	188	m16	25	116	157	123
Internal Link Dist (ft)		263		667			657		264
Turn Bay Length (ft)	70		50		190	55		75	
Base Capacity (vph)	140	1026	152	1042	929	96	462	256	614
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	0.35	0.47	0.43	0.38	0.13	0.11	0.25	0.59	0.29

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 (veh/h)	45	445	0	60	365	110	10	90	15	140	75	90
Future Volume (veh/h)	45	445	0	60	365	110	10	90	15	140	75	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	484	0	65	397	120	11	98	16	152	82	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	66	1095	0	83	1113	942	23	164	27	183	150	179
Arrive On Green	0.04	0.59	0.00	0.09	1.00	1.00	0.01	0.10	0.10	0.10	0.19	0.19
Sat Flow, veh/h	1781	1870	0	1781	1870	1582	1781	1562	255	1781	770	920
Grp Volume(v), veh/h	49	484	0	65	397	120	11	0	114	152	0	180
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1781	1870	1582	1781	0	1817	1781	0	1691
Q Serve(g_s), s	2.7	14.5	0.0	3.6	0.0	0.0	0.6	0.0	6.0	8.4	0.0	9.6
Cycle Q Clear(g_c), s	2.7	14.5	0.0	3.6	0.0	0.0	0.6	0.0	6.0	8.4	0.0	9.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.14	1.00		0.54
Lane Grp Cap(c), veh/h	66	1095	0	83	1113	942	23	0	191	183	0	329
V/C Ratio(X)	0.74	0.44	0.00	0.78	0.36	0.13	0.47	0.00	0.60	0.83	0.00	0.55
Avail Cap(c_a), veh/h	125	1095	0	125	1113	942	89	0	454	249	0	575
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	11.6	0.0	44.8	0.0	0.0	49.0	0.0	42.7	44.0	0.0	36.3
Incr Delay (d2), s/veh	5.9	1.3	0.0	8.4	0.9	0.3	5.3	0.0	1.1	11.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.0	0.0	1.7	0.3	0.1	0.3	0.0	2.7	4.3	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	12.9	0.0	53.2	0.9	0.3	54.3	0.0	43.9	55.7	0.0	36.8
LnGrp LOS	D	B	A	D	A	A	D	A	D	E	A	D
Approach Vol, veh/h		533			582			125			332	
Approach Delay, s/veh		16.6			6.6			44.8			45.5	
Approach LOS		B			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	62.6	14.3	14.5	7.7	63.5	5.3	23.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	38.0	14.0	25.0	7.0	38.0	5.0	34.0
Max Q Clear Time (g_c+I1), s	5.6	16.5	10.4	8.0	4.7	2.0	2.6	11.6
Green Ext Time (p_c), s	0.0	2.0	0.1	0.3	0.0	1.8	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	315	87	310	342	452	33	282
v/c Ratio	0.50	0.71	0.43	0.73	0.84	0.55	0.22	0.71
Control Delay	42.2	34.6	42.3	38.8	54.0	22.6	41.6	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	34.6	42.3	38.8	54.0	22.6	41.6	38.3
Queue Length 50th (ft)	50	122	39	132	156	133	15	118
Queue Length 95th (ft)	121	250	98	264	#437	365	50	238
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	405	669	405	684	405	827	405	663
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	0.28	0.47	0.21	0.45	0.84	0.55	0.08	0.43

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 (veh/h)	105	185	105	80	260	25	315	340	75	30	220	40
Future Volume (veh/h)	105	185	105	80	260	25	315	340	75	30	220	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1826	1870
Adj Flow Rate, veh/h	114	201	114	87	283	27	342	370	82	33	239	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	5	2
Cap, veh/h	148	275	156	113	382	36	390	594	132	62	326	59
Arrive On Green	0.08	0.25	0.25	0.06	0.23	0.23	0.22	0.40	0.40	0.03	0.22	0.22
Sat Flow, veh/h	1781	1111	630	1781	1677	160	1781	1479	328	1781	1501	270
Grp Volume(v), veh/h	114	0	315	87	0	310	342	0	452	33	0	282
Grp Sat Flow(s),veh/h/ln	1781	0	1742	1781	0	1837	1781	0	1807	1781	0	1771
Q Serve(g_s), s	4.0	0.0	10.5	3.0	0.0	9.9	11.7	0.0	12.6	1.2	0.0	9.4
Cycle Q Clear(g_c), s	4.0	0.0	10.5	3.0	0.0	9.9	11.7	0.0	12.6	1.2	0.0	9.4
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.18	1.00		0.15
Lane Grp Cap(c), veh/h	148	0	431	113	0	419	390	0	726	62	0	385
V/C Ratio(X)	0.77	0.00	0.73	0.77	0.00	0.74	0.88	0.00	0.62	0.53	0.00	0.73
Avail Cap(c_a), veh/h	451	0	716	451	0	755	451	0	743	451	0	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	21.9	29.2	0.0	22.7	23.9	0.0	15.1	30.0	0.0	23.0
Incr Delay (d2), s/veh	3.2	0.0	0.9	4.2	0.0	1.0	14.5	0.0	1.1	2.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	4.1	1.4	0.0	4.1	6.2	0.0	4.8	0.5	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.6	0.0	22.8	33.4	0.0	23.7	38.4	0.0	16.2	32.6	0.0	24.1
LnGrp LOS	C	A	C	C	A	C	D	A	B	C	A	C
Approach Vol, veh/h		429			397			794			315	
Approach Delay, s/veh		25.1			25.8			25.8			25.0	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	29.4	8.0	19.7	17.9	17.8	9.2	18.4				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s	3.2	14.6	5.0	12.5	13.7	11.4	6.0	11.9				
Green Ext Time (p_c), s	0.0	1.5	0.1	1.1	0.1	0.9	0.1	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			25.5									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	370	125	10	490	10	0	0	30	0	0	25
Future Vol, veh/h	80	370	125	10	490	10	0	0	30	0	0	25
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	402	136	11	533	11	0	0	33	0	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	550	0	0	540	0	0	1230	1218	479	1235	1281	555
Stage 1	-	-	-	-	-	-	646	646	-	567	567	-
Stage 2	-	-	-	-	-	-	584	572	-	668	714	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1020	-	-	1028	-	-	154	181	587	153	166	531
Stage 1	-	-	-	-	-	-	460	467	-	508	507	-
Stage 2	-	-	-	-	-	-	498	504	-	448	435	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1014	-	-	1026	-	-	129	155	582	128	142	523
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	155	-	128	142	-
Stage 1	-	-	-	-	-	-	402	408	-	442	496	-
Stage 2	-	-	-	-	-	-	461	493	-	368	380	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0.2	11.6	12.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	582	1014	-	-	1026	-	-	523
HCM Lane V/C Ratio	0.056	0.086	-	-	0.011	-	-	0.052
HCM Control Delay (s)	11.6	8.9	0	-	8.5	0	-	12.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0.2

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	163	348	54	179	272	364	87	494
v/c Ratio	0.66	0.72	0.36	0.59	0.81	0.47	0.48	0.85
Control Delay	48.2	35.4	44.9	38.6	55.0	23.4	46.2	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	35.4	44.9	38.6	55.0	23.4	46.2	45.3
Queue Length 50th (ft)	84	160	28	82	142	142	45	249
Queue Length 95th (ft)	156	270	67	151	#308	279	95	#494
Internal Link Dist (ft)		259		278		327		630
Turn Bay Length (ft)	85		65		95		150	
Base Capacity (vph)	341	561	341	570	341	780	341	578
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	0.48	0.62	0.16	0.31	0.80	0.47	0.26	0.85

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 (veh/h)	150	190	130	50	130	35	250	295	40	80	415	40
Future Volume (veh/h)	150	190	130	50	130	35	250	295	40	80	415	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	207	141	54	141	38	272	321	43	87	451	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	254	173	82	253	68	317	672	90	113	507	48
Arrive On Green	0.11	0.25	0.25	0.05	0.18	0.18	0.18	0.42	0.42	0.06	0.30	0.30
Sat Flow, veh/h	1781	1027	700	1781	1409	380	1781	1613	216	1781	1679	160
Grp Volume(v), veh/h	163	0	348	54	0	179	272	0	364	87	0	494
Grp Sat Flow(s),veh/h/ln	1781	0	1727	1781	0	1789	1781	0	1829	1781	0	1839
Q Serve(g_s), s	6.3	0.0	13.4	2.1	0.0	6.5	10.5	0.0	10.3	3.4	0.0	18.1
Cycle Q Clear(g_c), s	6.3	0.0	13.4	2.1	0.0	6.5	10.5	0.0	10.3	3.4	0.0	18.1
Prop In Lane	1.00		0.41	1.00		0.21	1.00		0.12	1.00		0.09
Lane Grp Cap(c), veh/h	204	0	428	82	0	321	317	0	762	113	0	556
V/C Ratio(X)	0.80	0.00	0.81	0.66	0.00	0.56	0.86	0.00	0.48	0.77	0.00	0.89
Avail Cap(c_a), veh/h	403	0	635	403	0	658	403	0	762	403	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.5	0.0	25.1	33.2	0.0	26.5	28.2	0.0	15.0	32.6	0.0	23.5
Incr Delay (d2), s/veh	2.7	0.0	3.0	3.3	0.0	0.6	11.7	0.0	0.2	4.2	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	5.5	1.0	0.0	2.7	5.3	0.0	3.9	1.5	0.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	0.0	28.1	36.4	0.0	27.0	40.0	0.0	15.2	36.8	0.0	34.3
LnGrp LOS	C	A	C	D	A	C	D	A	B	D	A	C
Approach Vol, veh/h		511			233			636			581	
Approach Delay, s/veh		29.7			29.2			25.8			34.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	33.5	7.3	21.5	16.6	25.4	12.1	16.7
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	26.0	16.0	26.0	16.0	26.0	16.0	26.0
Max Q Clear Time (g_c+I1), s	5.4	12.3	4.1	15.4	12.5	20.1	8.3	8.5
Green Ext Time (p_c), s	0.1	1.2	0.0	1.1	0.2	1.1	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	29.9
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	430	125	5	290	10	0	0	60	15	5	140
Future Vol, veh/h	50	430	125	5	290	10	0	0	60	15	5	140
Conflicting Peds, #/hr	6	0	2	2	0	6	10	0	7	7	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	467	136	5	315	11	0	0	65	16	5	152

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	332	0	0	605	0	0	1064	987	544	1020	1050	337
Stage 1	-	-	-	-	-	-	645	645	-	337	337	-
Stage 2	-	-	-	-	-	-	419	342	-	683	713	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1227	-	-	973	-	-	201	247	539	215	227	705
Stage 1	-	-	-	-	-	-	461	467	-	677	641	-
Stage 2	-	-	-	-	-	-	612	638	-	439	435	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1220	-	-	971	-	-	144	227	534	176	209	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	227	-	176	209	-
Stage 1	-	-	-	-	-	-	429	434	-	628	633	-
Stage 2	-	-	-	-	-	-	466	630	-	357	405	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	12.7	15.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	534	1220	-	-	971	-	-	515
HCM Lane V/C Ratio	0.122	0.045	-	-	0.006	-	-	0.338
HCM Control Delay (s)	12.7	8.1	0	-	8.7	0	-	15.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	1.5

Intersection	
Intersection Delay, s/veh	28.6
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	15	0	240	0	420	80	185	315	0
Future Vol, veh/h	0	0	0	15	0	240	0	420	80	185	315	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	5	2
Mvmt Flow	0	0	0	16	0	261	0	457	87	201	342	0
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	0	15.1	47.3	16.7
HCM LOS	-	C	E	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	100%	0%	100%	0%
Vol Thru, %	100%	84%	100%	0%	0%	0%	100%
Vol Right, %	0%	16%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	500	0	15	240	185	315
LT Vol	0	0	0	15	0	185	0
Through Vol	0	420	0	0	0	0	315
RT Vol	0	80	0	0	240	0	0
Lane Flow Rate	0	543	0	16	261	201	342
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0	0.933	0	0.036	0.479	0.38	0.603
Departure Headway (Hd)	6.296	6.182	8.509	7.845	6.615	6.799	6.341
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	582	0	454	543	527	565
Service Time	4.07	3.956	6.509	5.626	4.396	4.577	4.119
HCM Lane V/C Ratio	0	0.933	0	0.035	0.481	0.381	0.605
HCM Control Delay	9.1	47.3	11.5	10.9	15.4	13.7	18.4
HCM Lane LOS	N	E	N	B	C	B	C
HCM 95th-tile Q	0	12	0	0.1	2.6	1.8	4

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	70	325	125	10	405	5	90	5	30	0	0	25
Future Vol, veh/h	70	325	125	10	405	5	90	5	30	0	0	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	76	353	136	11	440	5	98	5	33	0	0	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	23.6	17.9	11.6	9.6
HCM LOS	C	C	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	72%	13%	2%	0%
Vol Thru, %	4%	62%	96%	0%
Vol Right, %	24%	24%	1%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	520	420	25
LT Vol	90	70	10	0
Through Vol	5	325	405	0
RT Vol	30	125	5	25
Lane Flow Rate	136	565	457	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0.243	0.782	0.661	0.047
Departure Headway (Hd)	6.443	4.982	5.213	6.193
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	556	723	694	575
Service Time	4.498	3.017	3.251	4.266
HCM Lane V/C Ratio	0.245	0.781	0.659	0.047
HCM Control Delay	11.6	23.6	17.9	9.6
HCM Lane LOS	B	C	C	A
HCM 95th-tile Q	0.9	7.7	5	0.1

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	2	0	0	25	2	200	10	25	115	2
Future Vol, veh/h	2	2	2	0	0	25	2	200	10	25	115	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	0	0	27	2	217	11	27	125	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	420	412	126	409	408	223	127	0	0	228	0	0
Stage 1	180	180	-	227	227	-	-	-	-	-	-	-
Stage 2	240	232	-	182	181	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	544	530	924	553	533	817	1459	-	-	1340	-	-
Stage 1	822	750	-	776	716	-	-	-	-	-	-	-
Stage 2	763	713	-	820	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	517	518	924	541	521	817	1459	-	-	1340	-	-
Mov Cap-2 Maneuver	517	518	-	541	521	-	-	-	-	-	-	-
Stage 1	820	735	-	774	715	-	-	-	-	-	-	-
Stage 2	736	712	-	799	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	9.6	0.1	1.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	606	817	1340	-	-
HCM Lane V/C Ratio	0.001	-	-	0.011	0.033	0.02	-	-
HCM Control Delay (s)	7.5	0	-	11	9.6	7.7	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	30	15	205	100	35
Future Vol, veh/h	55	30	15	205	100	35
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	0	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	60	33	16	223	109	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	364	109	147	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	255	-	-	-	-	-
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	635	945	1435	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	628	945	1435	-	-	-
Mov Cap-2 Maneuver	628	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1435	-	628	945	-	-
HCM Lane V/C Ratio	0.011	-	0.095	0.035	-	-
HCM Control Delay (s)	7.5	-	11.3	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.1	-	-

Intersection	
Intersection Delay, s/veh	63
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	0	15	0	145	0	425	80	160	635	0
Future Vol, veh/h	1	0	0	15	0	145	0	425	80	160	635	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	5	2
Mvmt Flow	1	0	0	16	0	158	0	462	87	174	690	0
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	11.9	12.8	43.3	85.6
HCM LOS	B	B	E	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	100%	0%	100%	0%
Vol Thru, %	100%	84%	0%	0%	0%	0%	100%
Vol Right, %	0%	16%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	505	1	15	145	160	635
LT Vol	0	0	1	15	0	160	0
Through Vol	0	425	0	0	0	0	635
RT Vol	0	80	0	0	145	0	0
Lane Flow Rate	0	549	1	16	158	174	690
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0	0.911	0.003	0.037	0.302	0.31	1.141
Departure Headway (Hd)	6.348	6.236	8.903	8.41	7.171	6.408	5.952
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	0	587	404	428	504	565	614
Service Time	4.048	3.936	6.903	6.11	4.871	4.108	3.652
HCM Lane V/C Ratio	0	0.935	0.002	0.037	0.313	0.308	1.124
HCM Control Delay	9	43.3	11.9	11.4	12.9	12	104.1
HCM Lane LOS	N	E	B	B	B	B	F
HCM 95th-tile Q	0	11.2	0	0.1	1.3	1.3	22.3

Intersection	
Intersection Delay, s/veh	24.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	45	350	125	5	265	10	115	15	55	10	5	125
Future Vol, veh/h	45	350	125	5	265	10	115	15	55	10	5	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	380	136	5	288	11	125	16	60	11	5	136
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	35.9	15.7	13.9	12
HCM LOS	E	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	9%	2%	7%
Vol Thru, %	8%	67%	95%	4%
Vol Right, %	30%	24%	4%	89%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	185	520	280	140
LT Vol	115	45	5	10
Through Vol	15	350	265	5
RT Vol	55	125	10	125
Lane Flow Rate	201	565	304	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.377	0.879	0.519	0.273
Departure Headway (Hd)	6.758	5.598	6.137	6.468
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	531	644	587	554
Service Time	4.818	3.639	4.187	4.532
HCM Lane V/C Ratio	0.379	0.877	0.518	0.274
HCM Control Delay	13.9	35.9	15.7	12
HCM Lane LOS	B	E	C	B
HCM 95th-tile Q	1.7	10.5	3	1.1

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	2	2	2	15	0	100	2	215	15	115	315	2
Future Vol, veh/h	2	2	2	15	0	100	2	215	15	115	315	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	5	2	2	5	2
Mvmt Flow	2	2	2	16	0	109	2	234	16	125	342	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	894	847	343	841	840	242	344	0	0	250	0	0
Stage 1	593	593	-	246	246	-	-	-	-	-	-	-
Stage 2	301	254	-	595	594	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	262	299	700	284	302	797	1215	-	-	1316	-	-
Stage 1	492	493	-	758	703	-	-	-	-	-	-	-
Stage 2	708	697	-	491	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	270	700	260	273	797	1215	-	-	1316	-	-
Mov Cap-2 Maneuver	210	270	-	260	273	-	-	-	-	-	-	-
Stage 1	491	446	-	756	702	-	-	-	-	-	-	-
Stage 2	610	696	-	441	446	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	12.2	0.1	2.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1215	-	-	303	628	1316	-	-
HCM Lane V/C Ratio	0.002	-	-	0.022	0.199	0.095	-	-
HCM Control Delay (s)	8	0	-	17.1	12.2	8	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.3	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	140	85	215	280	85
Future Vol, veh/h	85	140	85	215	280	85
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	0	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	92	152	92	234	304	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	722	304	396	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	394	736	1163	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	363	736	1163	-	-	-
Mov Cap-2 Maneuver	363	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	664	-	-	-	-	-

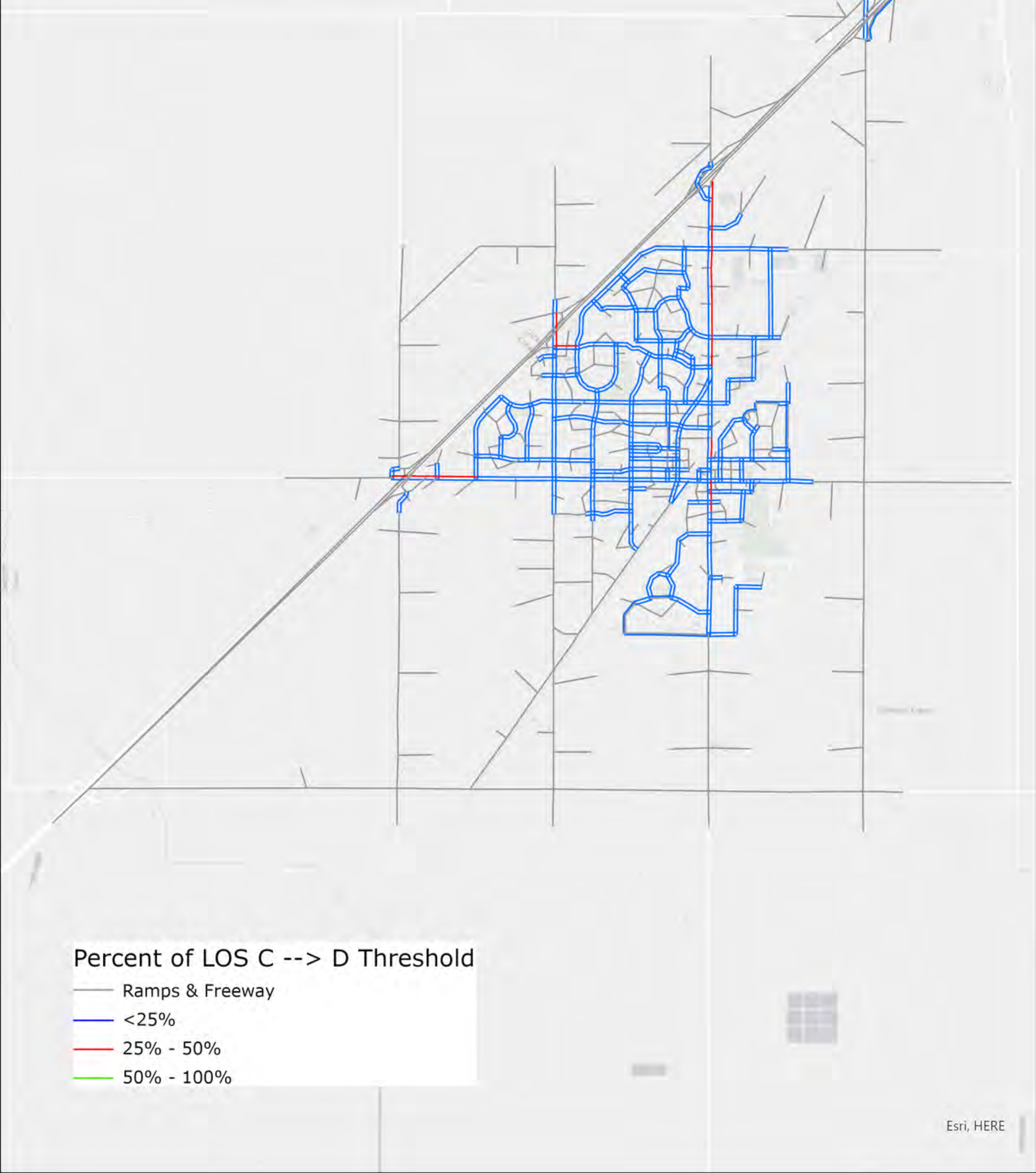
Approach	EB	NB	SB
HCM Control Delay, s	13.9	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1163	-	363	736	-	-
HCM Lane V/C Ratio	0.079	-	0.255	0.207	-	-
HCM Control Delay (s)	8.4	-	18.3	11.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	0.8	-	-

APPENDIX E – LOS SCREENING MAPS

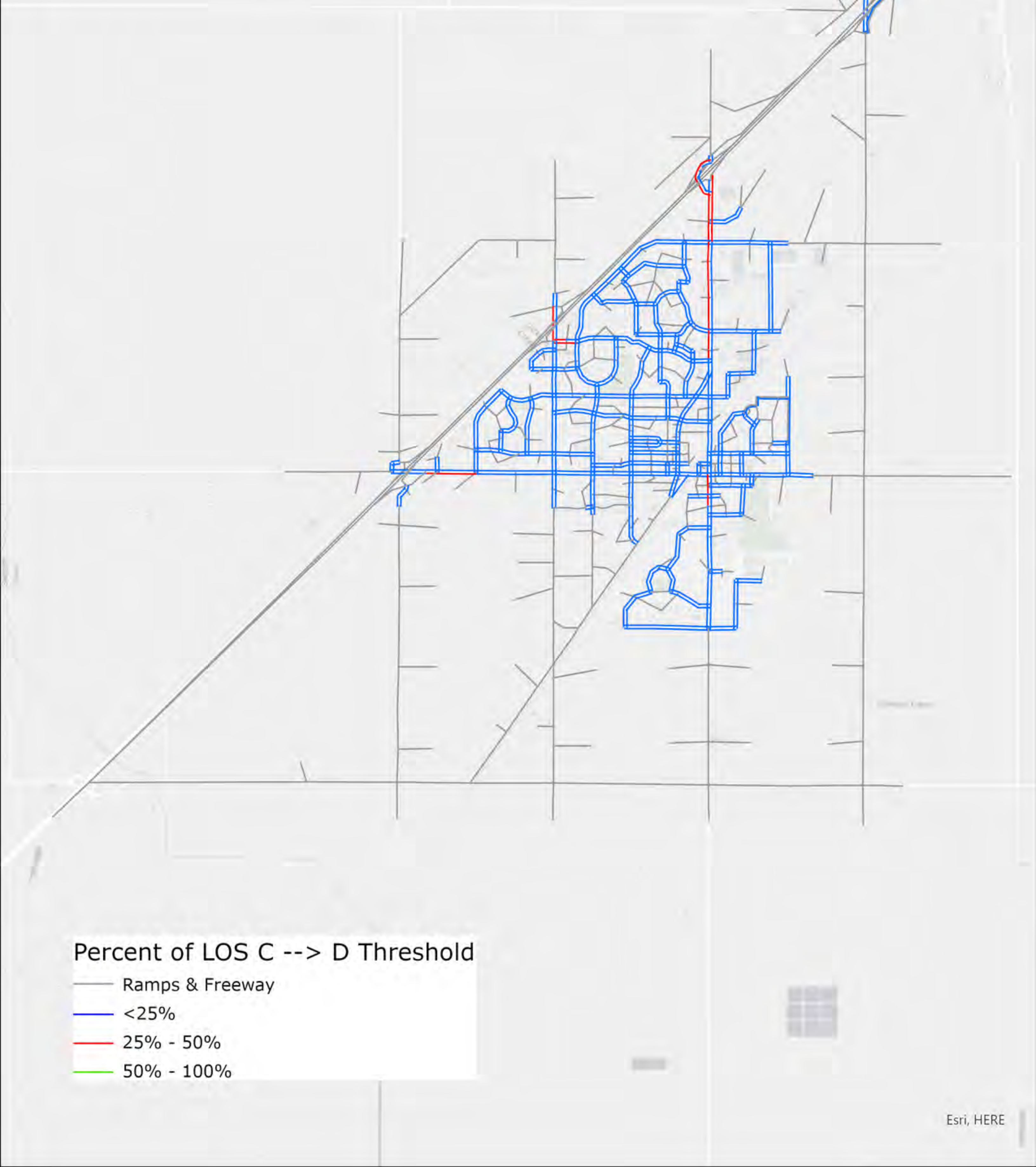
AM Peak Hour

2018 Base Year Model



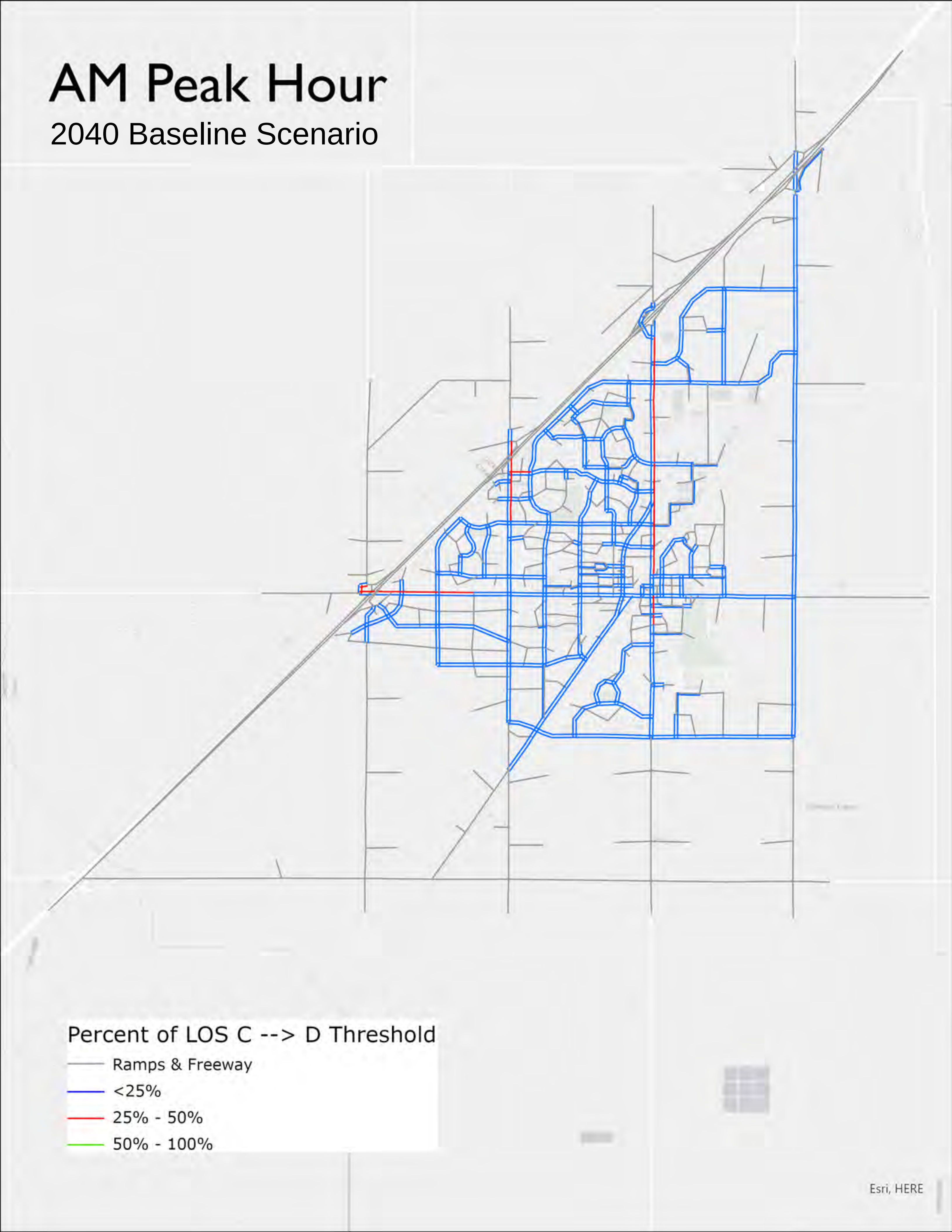
PM Peak Hour

2018 Base Year Model



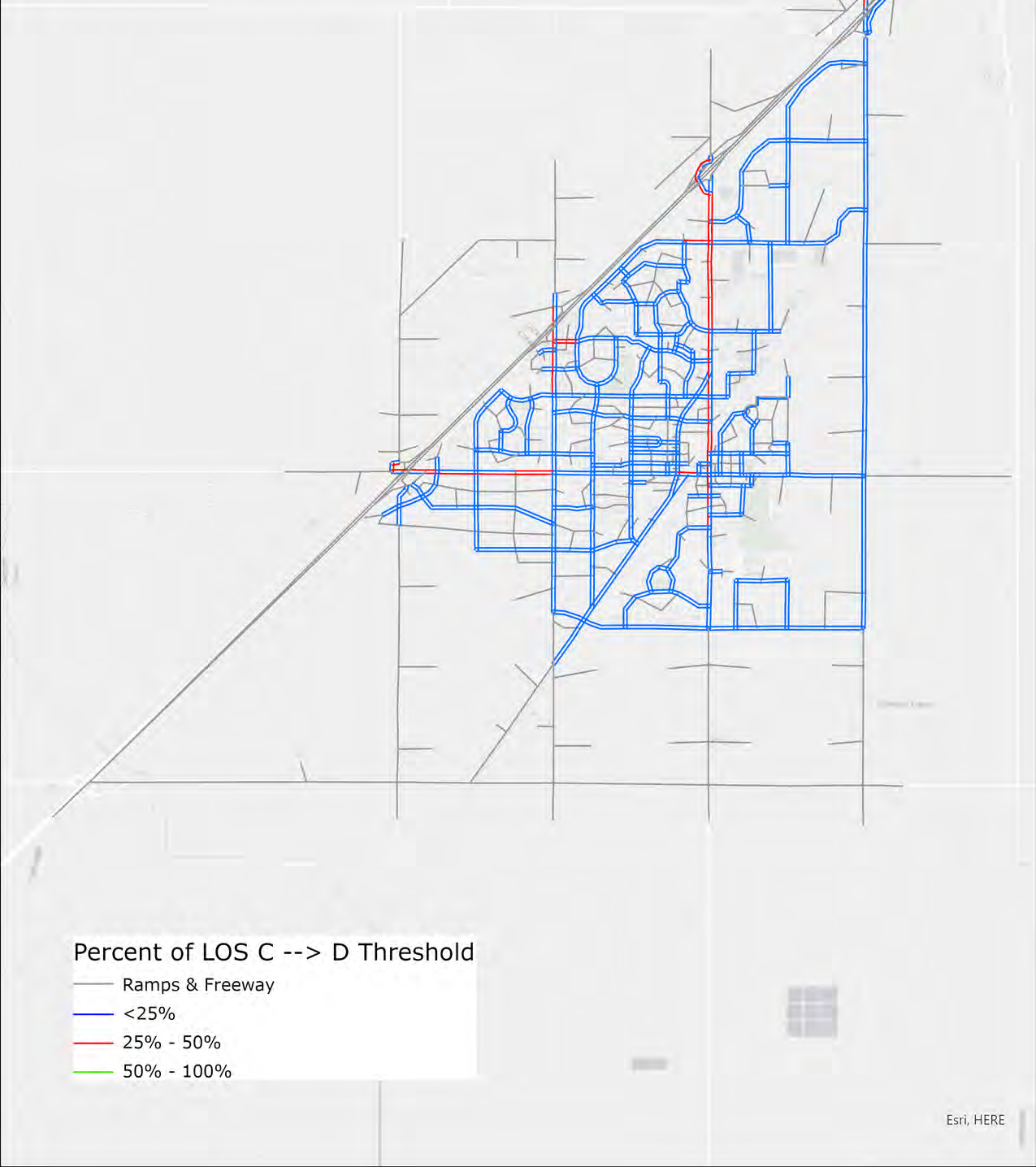
AM Peak Hour

2040 Baseline Scenario



PM Peak Hour

2040 Baseline Scenario



SECTION D. RAILROAD CROSSING IMPROVEMENTS MEMORANDUM

8950 CAL CENTER DRIVE, SUITE 340, SACRAMENTO, CA 95826 • 916.368.2000 • DKSASSOCIATES.COM

TECHNICAL MEMORANDUM

DATE: June 1, 2021

TO: Deborah Bar | City of Dixon

FROM: Erin Vaca, Kayla Fleskes, Bobby Sidhu | DKS Associates

SUBJECT: Dixon Rail Safety Traffic Study: Rail Crossing Improvements Project #20156-000

Based on the findings from the previous *Collison Data and Safety Analysis Memorandum* and the *Traffic Analysis Memorandum*, this memorandum documents recommended safety and operational improvements for the five at-grade rail crossings and adjacent study intersections in the City of Dixon. Each recommendation includes a high-level planning cost estimate[1] and description of benefits.

AT-GRADE CROSSING SIGNING AND STRIPING IMPROVEMENTS

For each at-grade crossing location, signing and striping improvements are necessary to meet current California *Manual on Uniform Traffic Control Device* (CA MUTCD)[2] standards. All signing and striping improvements should be consistent with the CA MUTCD and include:

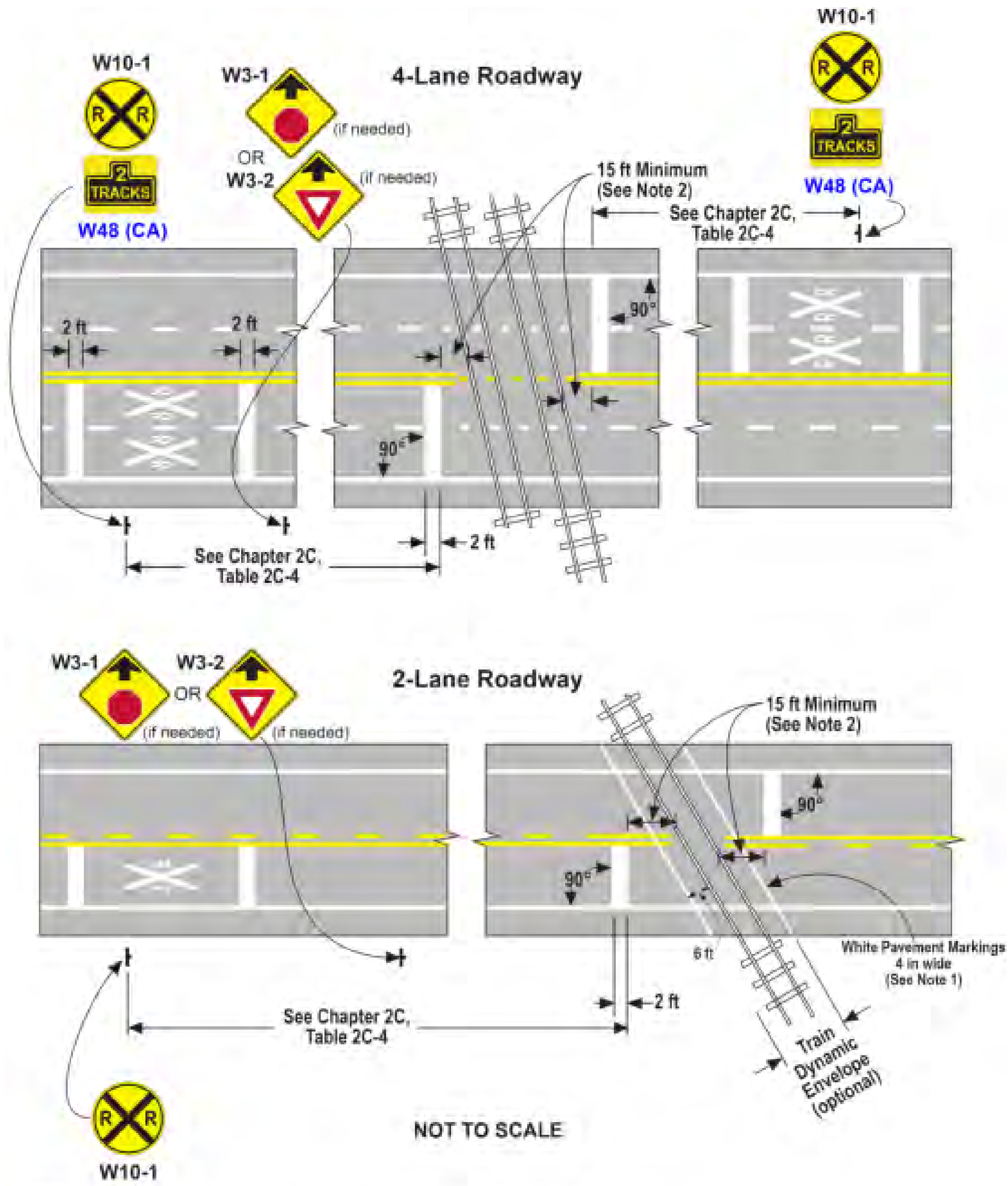
- Stop bar (24" wide) located approximately 8 feet from upstream gate
- Grade crossing advanced warning signs (36" diameter) such as W10-1, W10-2 and/or W10-12
- Grade crossing pavement markings (consisting of an X and the letters RR)
- Longitudinal pavement markings carried to the edge of the railroad crossing panels
- Reflective pavement markings
- Truncated domes (or other tactile pedestrian treatments) added approaching the railroad crossings on sidewalks

Figure 1 shows an example of placement of warning signs and pavement markings at grade crossings (per the MUTCD). In addition, at many locations, signing visibility can be improved by

[1] Assumptions for the cost estimates are included in Appendix A.

[2] California Manual on Uniform Traffic Control Devices (MUTCD) 2014 Edition Revision 5 March 27, 2020. Federal Highway Administration.[3] City of Dixon General Plan 2040, Public Hearing Draft, February 2021

removal of extraneous signs near the railroad. At each at-grade crossing, increased maintenance of vegetation can also improve sight distance at the crossing.



NOTES:

1. The distance between rail and the optional dynamic envelope pavement marking should be equal to 6 ft unless otherwise advised by the operating railroad.
2. Minimum 8 ft from the gate (if present), but no closer than 15 ft from the nearest rail. See Section 8B.28.
3. Longitudinal markings can be extended across the tracks at offset, skewed, complex, multilegged, curved roadway or multiple track crossings. See Section 8B.27.

FIGURE 1. EXAMPLE OF PLACEMENT OF WARNING SIGNS AND PAVEMENT MARKINGS AT GRADE CROSSINGS (SHEET 1 OF 3)

Source: MUTCD, Figure 8B-6 (CA)

NORTHEAST RAIL CROSSINGS

As noted in the previous *Collison Data and Safety Analysis Memorandum* and the *Traffic Analysis Memorandum*, the following findings were identified for the northeast rail crossings:

- Vaughn Road is part of the Solano County Dixon-Davis bikeway and crosses the railroad at a high skew angle, creating a potential issue for people biking.
- The all-way stop-controlled intersection of Vaughn Road/Pedrick Road is located in close proximity to both the Pedrick Road and Vaughn Road railroad crossing (approximately 650 feet south of the Pedrick Road crossing and approximately 415 feet east of the Vaughn Road railroad crossing).
- As growth occurs in northeast Dixon within the 20-year planning horizon, the all-way stop-controlled intersection is expected to operate with an average delay of 15 seconds or level-of-service (LOS) C, meeting City mobility thresholds.
- Speeds on Pedrick Road are high (55 miles per hour) which contributed to the one documented crash in the past five years at the Pedrick Road/Vaughn Road intersection.

To help improve safety and upgrade the railroad crossing locations to best practices while addressing the constraints listed above, several improvements were identified for the northeast rail crossings, discussed in more detail below.

AT-GRADE CROSSING SAFETY IMPROVEMENTS AT PEDRICK ROAD ($210,000)

Figure 2 (pg. 4) shows a conceptual diagram of the at-grade safety improvements identified at Pedrick Road. These at-grade solutions may be implemented independently or in conjunction with the larger improvements recommended for the northeast rail crossings and are discussed in more detail below.

ENHANCED SIGNING AND STRIPING AT RAILROAD CROSSINGS ($25,000)

As discussed above enhanced signage and striping may be added to better channelize vehicles at the crossing and upgrade the crossing to be consistent with current MUTCD standards. Signage warning of the railroad skew angle and associated bike issue (bicycle tires getting stuck in tracks) may be added until the multiuse path is constructed (see discussion below).

BICYCLE AND PEDESTRIAN FACILITY IMPROVEMENTS ($185,000)

At Pedrick Road, the railroad intersects at a significant skew angle, which can affect accessibility and safety for people walking and biking. While it would be infeasible to realign Pedrick Road to reduce the skew, the sidewalk and bicycle facilities may be more easily realigned to intersect with the rail crossing at a more perpendicular angle to reduce the crossing distance. While there is limited pedestrian and bicycle activity today, as the northeast area of Dixon continues to develop and become less rural in nature, these improvements may become more necessary. Any realignment of the bikeway should tie into the proposed bicycle facilities identified in the Solano Active Transportation Plan and Dixon General Plan 2040 to meet “complete streets” guidelines. This includes Class II bicycle lanes on Vaughn Road and a Class I multiuse path on the west side of Pedrick Road north of the railroad crossing. While Figure 2 (pg. 4) shows an enhanced pedestrian crossing of the railroad on the east side of Pedrick Road, this would not need to be installed until continuous sidewalk is present on the east side of Pedrick Road. Note that the improvements shown in Figure 2 below are conceptual in nature and will be refined during a future design phase.

FIGURE 2. PEDRICK ROAD AT-GRADE RAIL CROSSING SAFETY IMPROVEMENTS

VAUGHN ROAD REALIGNMENT ($5.5 MILLION)

The updated City of Dixon General Plan 2040[3] identifies a realignment of Vaughn Road, to eliminate the at-grade railroad crossing at Vaughn Road. The west leg of Vaughn Road may be realigned to connect to Pedrick Road north of the Pedrick Road railroad crossing, as shown in the conceptual diagram in Figure 3 (pg. 6). This realignment would eliminate the at-grade rail crossing on Vaughn Road and create a new three-leg intersection of Vaughn Road and Pedrick Road. Closure of the existing at-grade crossing would require pavement removal (or a vertical barrier) and creation of a cul-de-sac to allow vehicles to make a U-turn.

ALIGNMENT AND CROSS SECTION

Vaughn Road is identified as an arterial roadway in the Dixon General Plan 2040. While the City standard for an arterial roadway is a five-lane cross section[4], based on the 2040 forecast motor vehicle volumes on Vaughn Road the realigned cross section may be built as a three-lane roadway with right-of-way maintained for a future five-lane cross section. Figure 3 (pg. 6) shows the proposed cross section for the new Vaughn Road realignment as well as access to the adjacent industrial land uses (based on the City Standard Industrial Street Section). Note that the improvements shown in Figure 3 on pg. 6 are conceptual in nature and will be refined during a future design phase.

Any realignment of Vaughn Road should be forward compatible with a Pedrick Road overcrossing (see Pedrick Road Overcrossing discussion below). The potential impact area for an overcrossing is approximately 700 feet[5]. As the alignment for Vaughn Road is refined, at least 700 feet should be maintained between the railroad and the new Vaughn Road alignment and an attempt should be made to relocate any existing driveways greater than 370 feet from the intersection[6], consistent with City access spacing standards.

INTERSECTION CONTROL

As discussed in the *Traffic Analysis Technical Memorandum*, it is anticipated that a two-way stop-controlled intersection with the lane configuration shown in Figure 3 (pg. 6) would operate well through the 20-year planning horizon. Optionally, a roundabout may be installed at the northern intersection to help reduce speeds at the intersection and improve safety. Roundabouts reduce crashes and in particular reduce the severity of crashes (up to 82 percent reduction in severe crashes compared to two-way stop-controlled intersections). A roundabout would need to be designed to easily accommodate heavy vehicles and farm equipment, as the intersection is near

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[3] City of Dixon General Plan 2040, Public Hearing Draft, February 2021

[4] City of Dixon Engineering Design Standard, Figure 3-4H

[5] Rail Strategy Study: Grade Crossing Toolkit, Alameda County Transportation Commission, July 2018

[6] 370 feet required for full access on arterial streets, 250 required for right-in, right-out only access per City of Dixon Engineering Design Standard, Figure 14-1

industrial and agricultural areas. Note that a roundabout at the intersection would increase the cost of the realignment by approximately $2 million. Regardless of intersection improvement, it is recommended that the speed limit be reduced on Pedrick Road (if warranted by a speed study) as development of the Northwest Area occurs in Dixon to reduce the risk of severe crashes.

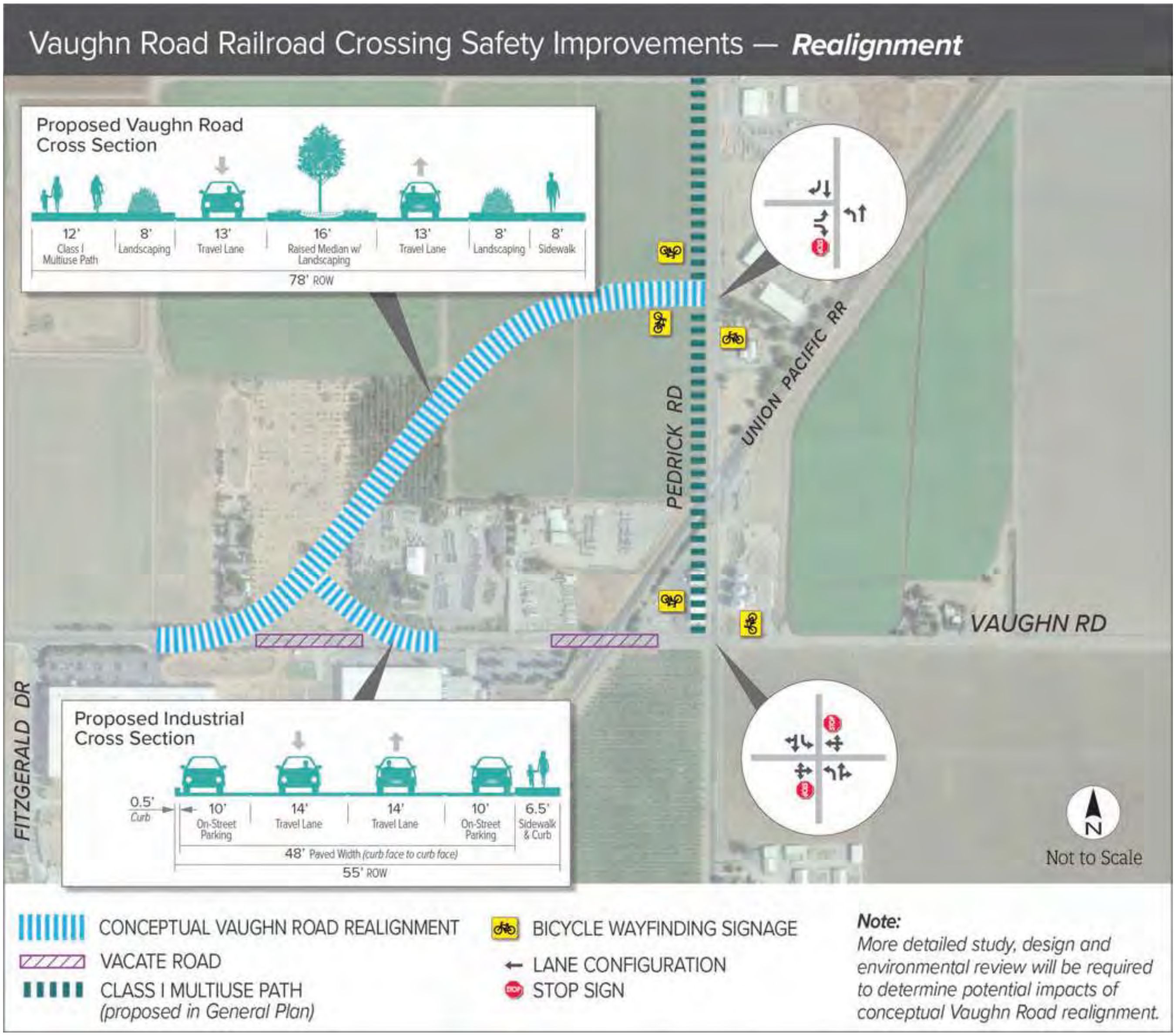

FIGURE 3. VAUGHN ROAD REALIGNMENT

PEDESTRIAN AND BICYCLE FACILITIES

Vaughn Road currently has a signed and striped Class II bike lane running in both directions, and is part of the Dixon-Davis Bikeway. As identified in the updated Dixon General Plan 2040, the realignment of Vaughn Road is planned as a Class I multi-use path (consistent with the proposed cross section in Figure 3 on pg. 6). Wayfinding signage may be added to help direct people biking to the new multi-use path and to continue on the Dixon-Davis Bikeway.

PEDRICK ROAD OVERCROSSING ($30 MILLION)

As a long-term solution, the at-grade crossing at Pedrick Road may be eliminated through a grade-separation project. An overcrossing would eliminate any potential conflicts between the railroad and people walking, biking, or driving. It would also improve reliability by eliminating delays associated with the rail crossings and may help accommodate demand from special event traffic associated with the fairground.

An overcrossing at Pedrick Road would be a relatively expensive solution, likely ranging from $20-30 million dollars. It is recommended that the Parkway Boulevard overcrossing, which is currently under design and has been a priority for the City since 1997[7], remain a higher priority grade-separation project. The Parkway Boulevard overcrossing provides an alternative option to the at-grade Pitt School Road crossing, which had a fatal crash in 2017, and provides a connection between the residential growth anticipated in the Southwest Area and the downtown area and Dixon High School (as discussed in the Southwest Rail Crossing section below).

CENTRAL RAIL CROSSINGS

As noted in the previous *Collison Data and Safety Analysis Memorandum* and the *Traffic Analysis Memorandum*, the following findings were identified for the central rail crossings:

- At the First Street railroad crossing, there is limited sight distance on the southeast corner of the railroad crossing and limited street lighting.
- At the A Street railroad crossing, the motor vehicle approach is steep due to multiple repavings. There are disconnected sidewalks at the railroad crossing.
- Multiple intersections are located within 1000 feet of both railroad crossings.
- There are limited enhanced crossing opportunities for people walking and biking to cross First Street, which has the B Street undercrossing on the west side and several pedestrian generators (such as an elementary school, a middle school, public library and park) on the east side.
- All the study intersections in the central area except for Jackson Street/A Street will meet the City's mobility standard in the future.

[7] https://sta.ca.gov/project/parkway-boulevard-grade-separation-project/

To help improve safety and upgrade the railroad crossing locations to best practices while accommodating and address the constraints listed above, several improvements were identified for the central rail crossings, discussed in more detail below.

AT-GRADE CROSSING SAFETY IMPROVEMENTS AT A STREET ($840,000)

Because safety improvements were recently constructed (November 2020) at First Street, only enhanced lighting is currently recommended as an improvement at the First Street railroad crossing. The following lower cost safety solutions were identified at A Street, shown in Figure 4 below and described in more detail below. Note that the improvements shown in Figure 4 below are conceptual in nature and will be refined during a future design phase. In particular, the multiuse path alignment is currently shown outside of the existing City right-of-way to allow the path to cross the railroad tracks at a 90-degree angle and limit the impact to the railroad right-of-way. During a future design phase, the path could instead be designed to cross the railroad tracks at a skew angle but with a wider path to allow bicycles to choose a path perpendicular to the tracks.

FIGURE 4. AT-GRADE CROSSING SAFETY IMPROVEMENTS AT A STREET RAILROAD CROSSING

ENHANCED SIGNAL TIMING, SIGNING, STRIPING AND LIGHTING AT RAILROAD CROSSINGS ($85,000)

Enhanced lighting is recommended near both railroad crossings in the central area, particularly the First Street crossing which only has one existing streetlight on the north side of the crossing. At the A Street railroad crossing, enhanced signage and striping may be added to better channelize vehicles at the crossing and to meet current MUTCD standards. Signage warning of potential bike issue due to the railroad skew angle may be added at the A Street railroad crossing until the broader bicycle and pedestrian facility improvements are implemented (see below). In addition, advanced rail preemption signal timing improvements should be implemented at A Street and Adams Street/Porter Street to add a longer track clearance time prior to the railroad gate arms coming down.

BICYCLE AND PEDESTRIAN FACILITY IMPROVEMENTS ($650,000)

At the A Street railroad crossing, the railroad intersects at a significant skew which can create hazardous conditions for people walking and biking. While it would be infeasible to realign A Street to reduce the skew, the sidewalk and bicycle facilities may be more easily realigned to intersect with the rail crossing at a more perpendicular angle to reduce the crossing skew and fencing could be added to discourage cutting directly across the tracks. Any realignment of the bikeway should tie into the proposed bicycle facilities identified in the Dixon General Plan 2040 (Class II bicycle lane on A Street and Class IV separated bikeway on First Street north of the railroad crossing).

Given the high level of pedestrian activity near the downtown area and the proximity of schools, it is also recommended that pedestrian barriers or gates be added at the crossing. One solution would be to add a barrier in an offset pattern to create a "maze" which forces pedestrians to look both ways approaching a sidewalk crossing (example shown in Figure 5 above). This type of barrier can help direct people walking to look both directions but may be

FIGURE 5. EXAMPLE OF A PEDESTRIAN BARRIER APPLICATION (BNSF COTTON CROSSING, PEORIA AZ)

Source: Highway-Rail Crossing Handbook, FHWA

FIGURE 6. EXAMPLE OF A PEDESTRIAN GATE ARM APPLICATION (PALM AVE CROSSING, ORANGE CA)

Source: Orange County Register https://www.ocregister.com/2010/10/13/railroad-crossings-enhanced-for-safety/

less effective where trains operate in both directions because pedestrians may be looking in the wrong direction[8].

Another application for the downtown crossings would be an automatic pedestrian gate, such as the one shown in Figure 6 above (pg. 9). To be most effective, the crossing arm would need to be paired with fencing to ensure people may not easily walk around a gate arm that is down. The crossing arm is recommended on A Street to reduce the out-of-direction travel experienced by people walking and biking and to reduce the right-of-way necessary for the improvement (compared to the pedestrian barrier).

Pedestrian scaled wayfinding signage may also be added near the A Street railroad crossing to direct people walking and biking to the B Street undercrossing during a longer rail crossing event.

REGRADE RAILROAD CROSSING ($105,000)

As identified in the *Safety Memorandum* and shown in Figure 7 below, the A Street approach at the railroad tracks is extremely steep and should be regraded.

FIGURE 7. STEEP APPROACH AT A STREET RAILRAOD CROSSING (LOOKING WEST)

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[8] *Highway-Rail Crossing Handbook,* 3rd Edition, Federal Highway Administration (FHWA)

https://safety.fhwa.dot.gov/hsip/xings/com_roaduser/fhwasa18040/chp2h.cfm

A STREET UNDERCROSSING ($30 MILLION)

In addition to the low-cost recommendations listed above, grade-separation was considered at the A Street railroad crossing. The feasibility of an undercrossing with a connection to a passenger rail station at A Street was previously studied in 2009[9]. The undercrossing would grade-separate rail traffic from motor vehicles and people walking and biking. Based on the 2009 study, the following constraints would need to be considered for an undercrossing:

- **Shoofly for Construction:** A temporary shoofly (detour bridge) would be required during construction of the undercrossing. The shoofly would require downtime of the railroad for cut operations. This would also require reconstruction/realignment of the First Street railroad crossing. To limit the potential construction impact to railroad operations, a more detailed study may be needed to look at potential alternatives to a shoofly. One potential alternative would be a box jacking system[10] (supporting the railroad tracks while jacking large boxes under the railroad) to keep the tracks in service during construction.
- **Design Speed**: In order to meet the required minimum vertical clearance under the bridge structure and match the existing grade at the intersections of Porter Street/Adams Street/A Street and Jackson Street/A Street, the undercrossing concept assumed a -12.1 percent and 13 percent profile, which is well above the five percent grade required to meet Dixon City Standards and would need to be approved by the City engineer. To achieve the grades noted above, a design speed of 15-20 mph was assumed, below the current posted speed limit of 25 mph. Additional traffic calming measures (such as dynamic speed feedback signs) may be implemented along A Street to accommodate the lower speed through the undercrossing.
- **Driveway Access**: No driveway access between Porter Road/Adams Street/A street and Jackson Street/A Street would be feasible, including the current U.S. Postal Service building. Relocation would be required if the underpass is constructed.
- **Sidewalk/Bikeway**: The sidewalk/bikeway is shown as a 12-foot-wide facility on the north side of A street, elevated from the roadway to maintain grades less than five percent. Crossing improvements would be required at Porter Road/Adams Street/A Street and Jackson Street/A Street to shift people walking and biking to the north side of A Street. Wayfinding signage could be added to direct people to the undercrossing.

It was estimated that an undercrossing would cost $22.4 million (2010 dollars). Given escalation factors over the last decade, the undercrossing would likely now cost over $30 million dollars (2021 dollars). In addition to the design and construction costs, the bridge structure would likely need to be maintained by the City, which would add to the life-cycle costs of the project. It is recommended that the Parkway Boulevard overcrossing, which is currently under design and has been a priority for the City since 1997[11], remain a higher priority grade-separation project. The Parkway Boulevard overcrossing provides an alternative option to the at-grade Pitt School Road crossing, which had a fatal crash in 2017, and provides a connection between the residential

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[9] *West A Street Grade Separation Project: Feasibility Study*, City of Dixon, July 2009

[10] https://www.petrucco.com/

[11] https://sta.ca.gov/project/parkway-boulevard-grade-separation-project/

growth anticipated in the Southwest Area and the downtown area and Dixon High School (as discussed in the Southwest Rail Crossing section below).

ADDITIONAL CENTRAL AREA IMPROVEMENTS ($185,000)

The *Safety Analysis Technical Memorandum* and *Traffic Analysis Technical Memorandum* documented the need for two additional central area improvements, regardless of improvements implemented at the railroad crossings: enhanced pedestrian crossings on First Street and an intersection improvement at Jackson Street/A Street.

ENHANCED FIRST STEET PEDESTRIAN CROSSING ($180,000)

Enhanced pedestrian crossings along First Street are needed to accommodate people walking to/from the B Street pedestrian undercrossing on the west side of First Street and various pedestrian generators on the east side (e.g., Dixon Public Library, Women's Improvement Club Park and Linford Anderson Elementary School). As shown in Figure 8 (pg. 13), pedestrian curb extensions and curb ramps may be added at B Street (south leg) and C Street (north leg) to help reduce the crossing distance and make people walking more visible to drivers. Given the proximity to the railroad, it is recommended that the rectangular rapid flashing beacon (RRFB) be moved from C Street to the enhanced pedestrian crossing at B Street. This would also better connect to many of the pedestrian generators in downtown Dixon. The RRFB should be upgraded to include flashing beacons on both sides of the sign, in compliance with the CA MUTCD. Note that the improvements shown in Figure 8 (pg. 13) are conceptual in nature and will be refined during a future design phase.

JACKSON STREET/A STREET INTERSECTION IMPROVEMENTS ($5,000)

Based on the traffic analysis, Jackson Street/A Street was identified as having high delay on the northbound approach, due to heavy left turn volumes. To help address the high levels of delay, a northbound left turn restriction is proposed at Jackson Street/A Street. While an all-way stop-controlled intersection may meet City mobility standards, it is likely that eastbound queues may back up towards the railroad crossing, creating a safety concern.

Signing restricting the northbound left turn at Jackson Street/A Street may be paired with traffic calming measures along Jackson Street, as well as right turn channelization (a porkchop) using a mountable curb design (traversable by emergency vehicles) to enhance compliance. In addition, the northbound left turn queue at First Street/A Street should be monitored after installing turn restrictions at Jackson Street/A Street. If left turn queues frequently extend into the through lane and block northbound through traffic, the turn lane may be restriped and lengthened to increase available storage for northbound left turning vehicles. This may be accommodated in the existing curb lines with select parking restrictions (impacting approximately five existing on-street parking spaces) on First Street between A Street and Mayes Street, as shown in Figure 9 (pg. 14).

FIGURE 8. FIRST STREET ENHANCED PEDESTRIAN OPPORTUNITIES

FIGURE 9. OPTIONAL MITIGATION FOR FIRST STREET QUEUEING

SOUTHWEST RAIL CROSSING

As noted in the previous *Collison Data and Safety Analysis Memorandum* and the *Traffic Analysis Memorandum*, the following findings were identified for the southwest rail crossings:

- There is limited distance (approximately 100 feet) between the stop bar for northbound vehicles and the railroad tracks.
- A fatal crash occurred in 2017 at the Pitt School Road railroad crossing, where an Amtrak train collided with a vehicle stopped on the tracks.

To help improve safety and upgrade the railroad crossing locations to best practices while accommodating and address the constraints listed above, two improvements were identified at the southwest rail crossings (as shown in Figure 10 on pg. 16), including an at-grade railroad crossing closure at Pitt School Road and the Parkway Boulevard Overcrossing.

Note that the County is currently pursuing implementation of low-cost systemic safety improvements, including adding a median on Pitt School Road, realigning the gate arm and restriping the intersection. Therefore, no additional at-grade safety improvements beyond upgrading signage and striping to MUTCD standards are recommended at the Pitt School Road at-grade railroad crossing at this time.

AT-GRADE RAILROAD CROSSING CLOSURE ($60,000)

A closure of the Pitt School Road at-grade railroad crossing would eliminate conflicts between the railroad and people walking, biking, and driving. The Railway-Highway At-grade Crossings program (Section 130) provides funding to help remove at-grade crossings[12], with matching funding available from the railroad. It is anticipated that funds associated with closing an at-grade crossing would help pay for improvements elsewhere on the system, including the Parkway Boulevard overcrossing. Closure of the existing at-grade crossing would require pavement removal, removal of the culvert, extending the ditch, and adding necessary barriers near the railroad to block motor vehicle, pedestrian and bicycle access. The creation of a cul-de-sac on the south side of the railroad tracks to allow vehicles to make a U-turn would also be required. In addition, the Vacaville-Dixon Bike Route (identified in the 2012 *Solano Countywide Bicycle Plan*) currently travels along Pitt School Road to Hawkins Road and an alternative bike route would need to be identified with a closure at Pitt School Road.

With the closure, the intersection is recommended to be reconfigured to a three-leg intersection with two-way stop-control, as shown in Figure 10 (pg. 16). If the intersection is converted to two-way stop-control, rumple strips or other improvements such as a flashing yellow warning light should be considered to alert drivers on Porter Road of an approaching intersection and help reduce vehicle speeds on Porter Road. As discussed in the *Traffic Impact Analysis Technical Memorandum,*

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[12] To receive funding, the project must be on a public road and included on the California Public Utility Commissions' Section 130 Priority list and included in the appropriate the Federal Transportation Improvement Program (FTIP) and Federal Statewide Transportation Improvement Program (FSTIP) list.

the closure of the south leg of the Pitt School Road/Porter Road intersection would reduce overall delay at the intersection but would increase the out-of-direction travel for some drivers, who would instead divert to Midway Road or use the proposed Parkway Boulevard Overcrossing. Diversion onto Midway Road is expected to be minor, with only 25-50 additional peak hour trips in each direction at the intersection by 2040 (approximately 800-900 daily trips). At-grade rail crossing improvements may be considered by Solano County at Midway Road given the crash history (five incidents at the rail crossing since 2007).

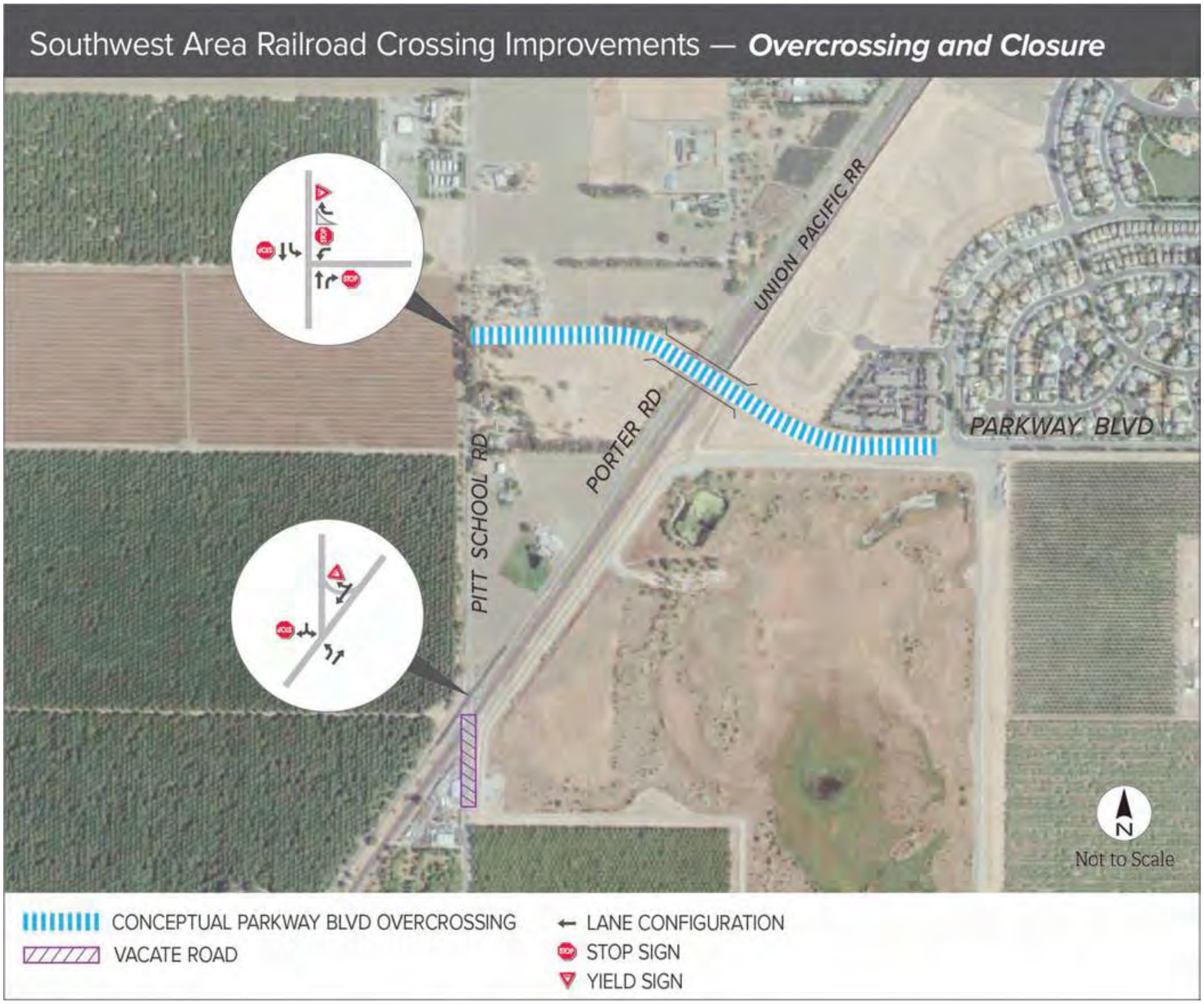

FIGURE 10. RECOMMENDED IMPROVEMENTS NEAR THE SOUTHWEST RAIL CROSSING

PARKWAY BOULEVARD OVERCROSSING ($25 MILLION)

The Parkway Boulevard Overcrossing, shown in Figure 10 (pg. 16), has been a priority for the City since 1997[13]. The Parkway Boulevard Overcrossing will be the first grade separated motor vehicle crossing of the railroad within the City. It provides an alternate route for vehicles when longer train crossing events or incidents occur and enhanced access for emergency responders. The Parkway Boulevard overcrossing also provides an alternative option to the at-grade Pitt School Road crossing, which had a fatal motor vehicle/train crash in 2017. The overcrossing connects the large southwest growth area to Dixon High School and provides an alternate route to the downtown area. With a future extension of Parkway Boulevard to Pitt School Road, it also provides as a bypass to congestion downtown and along First Street. The overcrossing is currently under design and as part of the design process, a detailed cost estimate is being compiled. As a placeholder that will be refined as design progresses, it is assumed the overcrossing will cost approximately $25 million dollars.

INTERSECTION CONTROL AND CROSS SECTION

To accommodate the traffic shifts associated with the overcrossing and Pitt School Road at-grade crossing closure, Figure 10 (pg. 16) shows the recommended lane configuration and traffic control. Based on current traffic forecasts, the previously identified four-lane cross section is not needed on Parkway Boulevard in the 20-year planning horizon. However, to accommodate future traffic demand beyond the 20-year planning horizon, particularly as Dixon continues to grow to the south of the current City limits, a bridge structure that can accommodate a four-lane roadway is recommended (note that the bridge is designed to a 100-year design life).

Figure 11 (pg. 18) shows an example[14] of an interim cross section that may be implemented on Parkway Boulevard and on the bridge. The example cross sections include a Class I multiuse path as the overcrossing helps connect the residential growth area in the southwest to Dixon High School and provides an alternate route to the downtown area. The Class I multiuse path provides separation from motor vehicle traffic and is consistent with the City's "complete streets" policy. Once traffic demand beyond the 20-year planning horizon warrants expanding to two travel lanes in each direction, the roadway cross section can be reallocated to accommodate four lanes of motor vehicle traffic.

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[13] https://sta.ca.gov/project/parkway-boulevard-grade-separation-project/

[14] Note that design is currently on-going for the Parkway Boulevard Overcrossing and the bridge width or cross section may be subject to change as design progresses.

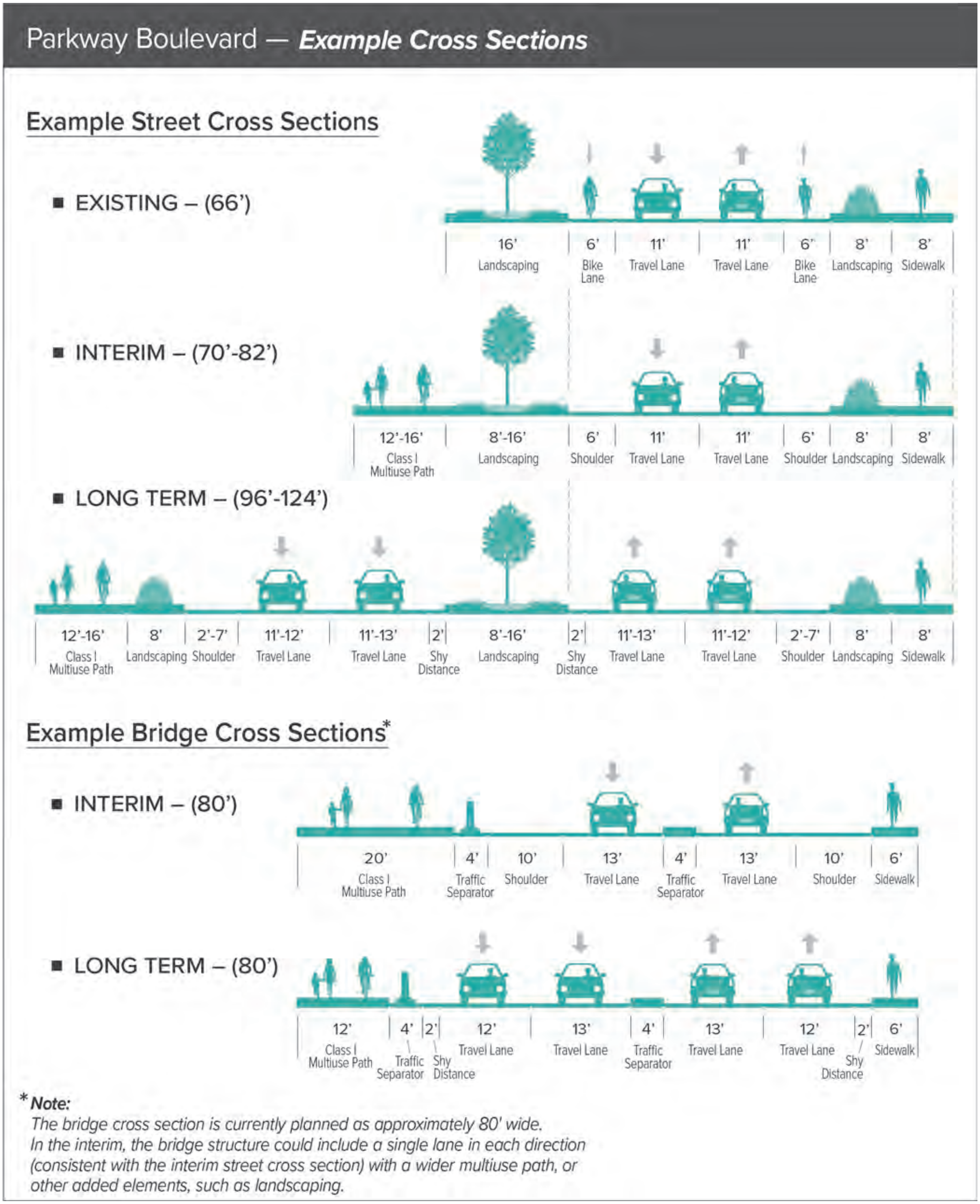


FIGURE 11. EXAMPLE PARKWAY BOULEVARD CROSS SECTION

ADDITIONAL SYSTEM-WIDE IMPROVEMENTS

Full-closure gate systems: While no proof or documentation of vehicles driving around the gate arms was identified at any of these crossing locations, vehicles driving around the gates appears to be an issue at the nearby railroad crossing at Midway Road (this crossing is in unincorporated Solano County), where over the past thirty years, two of six recorded incidents were related to driving around the gate. A second gate arm may be added on the exit legs of any of the at-grade crossing to prohibit vehicles from driving around the gate arms during a train crossing, similar to the improvement at First Street. To avoid entrapment within the crossing zone, detection loops must be installed to ensure that the gates on the exit legs remain raised until all vehicles have cleared the track. The ongoing need to maintain this sensor system is one of the primary downsides of installing a four-quad gate system[15]. As an alternative to a full-closure system, a raised median may be added at the urban at-grade crossings to reduce the potential for vehicles to drive around gate arms.

Advanced warning systems: While many of the Amtrak commuter trains that run on the railroad line pass relatively quickly with minimal delay, longer freight trains can block the track for longer periods of time. An advance warning system may be installed throughout the city to alert drivers of the expected delay. This would allow drivers to reroute to the nearest grade-separated railroad crossing.

POTENTIAL FOR GRADE SEPARATION PROGRAM FUNDING

One potential source of funding for grade separation of railroad crossings is the Caltrans Railroad-Highway Grade Crossing Program (RHGCP), also known as the Section 190 program. This competitive grant program provides $15 million each year to local agencies for the construction of grade separation projects. The intent of the program is to improve safety and expedite the movement of vehicles by eliminating highway-rail crossing at grade with a grade separation.

The program limits funding to $5 million per project per year at up to 80% of the estimated project cost (up to $20 million over multiple years) and can be used by an individual agency once every 10 years. Projects are prioritized for funding based on criteria such as daily vehicle/train traffic, crash history, delay, and other identified funding sources. The criteria, formulas, and calculation of likely priority index for each railroad crossing are included in Appendix B.

Table 1 below lists the likely range of priority index numbers for each of the crossings (with high priority index numbers indicating a higher priority). For reference, the top nine (out of 36) crossing locations on the priority list for fiscal year (FY) 2020-2021 have a priority index of greater than 1000. However, the top priority projects may not always meet the major funding requirements (e.g., completion of environmental review and construction documents, procurement of remainder

[15] Rail Strategy Study: Grade Crossing Toolkit, Alameda County Transportation Commission, July 2018

of the project cost, etc.) and lower priority projects may be allocated funding first. For example, from 2015 to 2020, projects which were allocated funding had priority indexes ranging from a high of 3,592 to a low of 114 (ranging in ranking from 3rd to 47th on their respective project lists).

TABLE 1. GRADE SEPARATION PRIORITY INDEX

RAILROAD CROSSING	PRIORITY INDEX RANGE (ROUNDED)	APPROXIMATE RANKING (USING FY 2020-2021 LIST)
PEDRICK ROAD OVERCROSSING	110 – 45	#32 – 38
A STREET UNDERCROSSING	150 – 50	#26 – 36
PARKWAY BOULEVARD OVERCROSSING (CLOSURE OF PITT SCHOOL ROAD)	245 – 85	#20 – 32

APPENDIX A

DKS Associates
1970 Broadway, Suite 740
Oakland, CA 94612
www.dksassociates.com

Project: Dixon Rail Safety Study - Planning Level Cost Estimate: North East Area
Date: April 27, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
Pedrick Road At-Grade Railroad Crossing Improvements							
1	Install Signage	LS	$ 5,000.00	1	$ 5,000.00	$ 3,500.00	
2	Install Striping	LS	$ 10,000.00	1	$ 10,000.00	$ 7,000.00	
Enhanced Signing and Striping at Railroad Crossings					$	25,500.00	
3	Multi-Use Perpendicular Crossing Concrete Path	SF	$ 20.00	1200	$ 24,000.00	$ 16,800.00	
4	Install Concrete Pad across Rail Tracks	EA	$ 20,000.00	2	$ 40,000.00	$ 28,000.00	
5	Install Light Pole and Foundation	EA	$ 10,000.00	2	$ 20,000.00	$ 14,000.00	
6	Excavation to remove asphalt pavement to continue ditch	LS	$ 20,000.00	1	$ 20,000.00	$ 14,000.00	
7	Install Metal Railing	LF	$ 50.00	100	$ 5,000.00	$ 3,500.00	
Bicycle and Pedestrian Facility Improvements					$	185,300.00	
Pedrick Road At-Grade Railroad Crossing Improvements Total				$		210,800	
Vaughn Road Realignment							
1	Vaughn Rd Realignment	LS	$ 5,500,000.00	1	-	$ 5,500,000.00	Dixon CIP Estimate
Vaughn Road Realignment Total				$		5,500,000	
Pedrick Rd Overcrossing							
1	Pedrick Rd Overcrossing	LS	$ 25,000,000.00	1	-	$25,000,000.00	Based on Parkway Blvd Overcrossing cost estimate
Pedrick Road Overcrossing Total				$		25,000,000	
*Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 30%							

DKS Associates
1970 Broadway, Suite 740
Oakland, CA 94612
www.dksassociates.com

Project: Dixon Rail Safety Study - Planning Level Cost Estimate: Central Area
Date: April 27, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
A Street At-Grade Railroad Crossing Improvements							
1	Install and Adjust Signage	LS	$ 5,000	1	$ 5,000	$ 3,500	
2	Install Striping	LS	$ 10,000	1	$ 10,000	$ 7,000	
3	Install Light Pole and Foundation	EA	$ 10,000	3	$ 30,000	$ 21,000	
4	Re-time signal to increase advance preemption	EA	$ 3,000	1	$ 3,000	$ 2,100	
Enhanced Signing, Striping and Lighting at Railroad Crossings					$	81,600	
5	Remove Existing Pavement	LS	$ 10,000	1	$ 10,000	$ 7,000	
6	Regrade Pavement/tracks	LS	$ 50,000	1	$ 50,000	$ 35,000	
Regrade Railroad Crossing					$	102,000	
7	Multi-Use Perpendicular Crossing Concrete Path	SF	$ 20	1800	$ 36,000	$ 25,200	
8	Install Concrete Pad across Rail Tracks	EA	$ 20,000	2	$ 40,000	$ 28,000	
9	Install Metal Railing	LF	$ 50	120	$ 6,000	$ 4,200	
10	Install Pedestrian Crossing Gates and System	EA	$ 75,000	4	$ 300,000	$ 210,000	
Bicycle and Pedestrian Facility Improvements					$	649,400	
A Street At-Grade Railroad Crossing Improvements Total				$		833,000	
Additional Central Area Improvements							
11	Install Mountable Curb (NBL restriction at Jackson)	EA	$ 2,000	1	$ 2,000	$ 1,400	
12	Relocate Existing RRFB	EA	$ 1,000	2	$ 2,000	$ 1,400	Hardware or re-timing signal
13	Install Flashing RRFB to existing poles	EA	$ 5,000	2	$ 10,000	$ 7,000	
14	Install Concrete Pedestrian Curb Extensions	EA	$ 15,000	4	$ 60,000	$ 42,000	
15	Install Concrete ADA Curb Ramps with Detectable Surface	EA	$ 8,500	4	$ 34,000	$ 23,800	
Additional Central Area Improvements Total				$		183,600	
A Street Undercrossing							
1	A Street Grade Separated Undercrossing	LS	$ 30,000,000.00	1	-	$ 30,000,000	Escalated A St Study (2009) cost estimate to 2021 dollars
A Street Undercrossing Total				$		30,000,000	
*Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 30%							

DKS Associates
1970 Broadway, Suite 740
Oakland, CA 94612
www.dksassociates.com

Project: Dixon Rail Safety Study - Planning Level Cost Estimate: South West Area
Date: April 27, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
Pitt School Road At-Grade Railroad Crossing Closure							
1	Install Signage	LS	$ 5,000	1	$ 5,000	$ 3,500	
2	Install Reflective Striping	LS	$ 10,000	1	$ 10,000	$ 7,000	
3	Excavation to remove asphalt pavement to continue ditch	LS	$ 20,000	1	$ 20,000	$ 14,000	
Pitt School Road At-Grade Railroad Crossing Closure Total					$	59,500	
Parkway Boulevard Overcrossing							
1	Parkway Blvd - Grade Separated Overpass	LS	$ 25,000,000	1	-	$ 25,000,000	Parkway Blvd Estimate per TY Lin
Parkway Boulevard Overcrossing Total					$	25,000,000	
Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 30%							

APPENDIX B

Section 190 Funding Criteria Factors	Points for Each Crossing Location								
	Pedrick Road Overcrossing			A Street Undercrossing			Parkway Boulevard Overcrossing/ PItt School Road Closure		
	Low	High	Notes	Low	High	Notes	Low	High	Notes
Avg. daily Traffic	4236	4236	Tube count on Pedrick Road north of Vaughn Road	8045	8045	Tube count on A Street west of Adams	1525	1525	Tube count on Pitt School Road south of Midway
Avg. Daily Freight/ Commuter train Traffic	40	40	From FRA crossing inventory	40	40	From FRA crossing inventory	40	40	From FRA crossing inventory
Avg. Daily Light Rail Train Traffic	0	0	No light rail trains	0	0	No light rail trains	0	0	No light rail trains
Project Cost Share to Be Allocated from Grade Separation Fund	12500	2500	Low: 50% of cost funded through Section 130 program High: 10% of cost funded through Section 130 program	15000	3000	Low: 50% of cost funded through Section 130 program High: 10% of cost funded through Section 130 program	5000	1250	Low: 20% of cost funded through Section 130 program High: 5% of cost funded through Section 130 program
Accident History	0	0	No crashes in past 10 years	0	0	No crashes in past 10 years	3	3	1 fatality in past 10 years
Special Conditions Factor	29	41		28	40		36	51	
Crossing Blocking Delay	5	5	5+ mins delay per day (max 5 pts)	5	5	5+ mins delay per day (max 5 pts)	5	5	5+ mins delay per day (max 5 pts)
Vehicular Speed Limit	5	5	55 mph speed limit	0	0	30 mph speed limit	5	5	55 mph speed limit
Railroad Prevailing Maximum Speeds	5	6	Low: Maximum speed 70 mph High: Maximum speed 79 mph	5	6	Low: Maximum speed 70 mph High: Maximum speed 79 mph	5	6	Low: Maximum speed 70 mph High: Maximum speed 79 mph
Crossing Geometrics	4	8	Low: 0 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 0 pts elevated surface profiles, 0 pt parallel road, 0 pts traffic signal, 0 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature High: 0 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 4 pts elevated surface profiles, 0 pt parallel road, 0 pts traffic signal, 0 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature	8	12	Low: 0 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 2 pts elevated surface profiles, 0 pt parallel road, 1 pts traffic signal, 1 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature High: 2 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 4 pts elevated surface profiles, 0 pt parallel road, 1 pts traffic signal, 1 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature	8	12	Low: 0 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 2 pts elevated surface profiles, 1 pt parallel road, 0 pts traffic signal, 1 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature High: 2 pts quadrant sight distance, 2 pts skewed crossing angle, 2 pts main number of tracks, 4 pts elevated surface profiles, 1 pt parallel road, 0 pts traffic signal, 1 pts entrace/exit within 100 ft, 0 pts raised median, 0 pts track curvature
Passenger Trains	6	7	Low: 31-40 passenger trains High: 41-50 passenger trains	6	7	Low: 31-40 passenger trains High: 41-50 passenger trains	6	7	Low: 31-40 passenger trains High: 41-50 passenger trains
Other Factors	4	10	Low: 1 pt school bus, 0 passenger bus, 1 hazmat trucks, 2 community impact High: 3 pt school bus, 0 passenger bus, 2 hazmat trucks, 5 community impact	4	10	Low: 1 pt school bus, 0 passenger bus, 1 hazmat trucks, 2 community impact High: 3 pt school bus, 0 passenger bus, 2 hazmat trucks, 5 community impact	7	16	Low: 1 pt school bus, 0 passenger bus, 1 hazmat trucks, 5 community impact High: 3 pt school bus, 0 passenger bus, 3 hazmat trucks, 10 community impact
PRIORITY INDEX	43	109		49	147		85	246	

SECTION E. DIAGNOSTIC MEETING MINUTES AND UPRR TECHNICAL MEMORANDUM

MEETING SUMMARY

DIXON RAIL SAFETY AND TRAFFIC STUDY

DIXON AT-GRADE CROSSING CORRIDOR DIAGNOSTIC MEETING

APRIL 19, 2021

DIXON, CA

ATTENDEES (SEE PROJECT SIGN IN SHEET)

ACTION ITEMS

ACTION ITEM	RESPONSIBLE ENTITY
Circulate comprehensive notes to diagnostic team for review	City of Dixon
Provide copy of A Street Assessment of Interconnected High-Rail Grade Crossing evaluation report (CTC) to diagnostic team	UPRR
Provide relevant design guidance documents to diagnostic team	UPRR
Provide updated ADT information at each rail crossing to include % trucks and emergency services use to diagnostic team and CPUC to update FRA inventory	City of Dixon/CPUC
Provide number of school buses at each crossing to diagnostic team and CPUC to update FRA inventory	School District/CPUC
City to increase A Street Track Clearance Green to 32 seconds per previous CTC recommendation. Agency to provide traffic signal timing to Diagnostic Team.	City of Dixon

BACKGROUND/PURPOSE OF MEETING (CITY OF DIXON)

City of Dixon

Deborah Barr from City of Dixon provided a brief background of the City of Dixon's short- and long-term goals and explained intent and purpose of the meeting specifically stating safety is of high concern and making note that the City is in the process of resurrecting the Parkway Blvd. overcrossing project, which is proposes a new overpass over UPRR ROW adjacent to Pitt School Rd (from Parkway Blvd to Pitt School Rd North of the Porter Rd intersection). She also clarified TY Lin is the City's consultant assisting with the re-design of the proposed bridge along with the revalidation process for the environmental certifications (CEQA/NEPA), and DKS is the City's consultant preparing the Rail Safety Study, Streets Master Plan, and Transportation Impact Fees. She further stated the City of Dixon along with City's consultants are hoping to obtain general feedback from UPRR along with other agencies, to better understand each agency's concerns about each railroad crossing both in and around the City of Dixon (including Pitt School Road, future Parkway Blvd., A Street, N. First Street, Vaughn Road, and Pedrick Road).

City also noted all parties have been invited in hopes to narrow the communication gap and to better collaborate with each entity; the City wants to hear what concerns each agency has at each crossing and aim for the common goal of safety. Through this method, the City is hoping the future modifications address each agencies concerns and the proposed solutions are in the best interest of the traveling public. Furthermore, the City is looking to have collaboration with Solano County and determining if closure of Pitt School Rd. is a viable alternative and what other factors or concerns shall be acknowledged.

Anthony Adams (Solano County) further noted the importance of safety and expanded on STA's (Solano County Transportation Authority) participation in assisting the City. The County aims to collaborate with the City on the Dixon Rail Safety and Traffic study that is underway. The County is also actively working on obtaining funding for the proposed projects in the sphere of the City of Dixon's rail corridor.

OVERVIEW, SAFETY BRIEFING, AND GENERAL NOTES:

Ellis Mays, Alfred Benesch (on behalf of UPRR) led job safety briefing to include railroad safety information as well as site specific conditions and emergency response protocols to follow during site meeting.

All crossings discussed herein are on the Martinez subdivision which carries 40 trains per day at up to 79 mph. This line has UPRR as well as Amtrak traffic. This is considered a high priority interstate commerce line by the Federal government.

Ellis provided context for the meeting with an excerpt from the CA MUTCD Section 8A.01:

> A diagnostic team, consisting of knowledgeable representatives of parties of interest in a highway-rail or highway-LRT grade crossing, using crossing safety management principles, evaluates conditions at a grade crossing to make determinations or recommendations concerning safety needs at the grade crossing. The diagnostic team needs to, at a minimum, include representatives of the highway agency or authority with jurisdiction over the roadway, the railroad or LRT agency with responsibility of the track and signals, and the California Public Utilities Commission (CPUC), which is the state regulatory agency with statutory authority over grade crossings. The removal, reduction, addition, or change in the type of warning devices at each public grade crossing, or publicly used private grade crossing (as determined by the CPUC or a court competent jurisdiction), must be authorized by the CPUC. This includes any changes that can affect interconnections with adjacent traffic signals, or any other modification that may

impact the safety of the grade crossing. Refer to Public Utilities Code Sections 1201 through 1205, 7537, 99152 and CPUC General Orders 75 and 88, as amended.

Ellis provided brief description of UPRR's Crossing Assessment Process (CAP). CAP is an initiative that was started in 2015 to enhance grade crossing safety in the communities in which UPRR operates which draws on data to identify grade crossings for further safety enhancement. This initiative is based on a regression model that uses data available to UPRR about its environment and infrastructure. The last model run compared a little over 20,000 public crossings over UPRR's 23 state network to find characteristics that are statistically significant in crossings that have had incidents. These statistically significant characteristics include unsafe motorist reports, vehicle on track events, interconnection status, average daily traffic count, average daily train count, etc. The model categorizes crossings in three tiers. A Tier 1 or Tier 2 crossing has several statistically significant characteristics; a Tier 3 crossing does not have several statistically significant characteristics. Each crossing ranking shown in the respective section below as well as the recommendations made as part of that assessment.

As general instruction for the diagnostic process each crossing will be individually assessed, and the team will first discuss short-term recommendations based on the existing conditions. Typically, these recommendations aim to improve conformance with CA MUTCD guidance. Additionally, these short-term recommendations will aim to improve operations at that crossing based on observations by the team. Long-term recommendations will also be discussed which are more involved recommendations based on the existing or proposed condition.

It was noted by UPRR that each crossing (aside from Parkway Blvd) will need to be re-diagnosed as scope is better defined in the future as part of that future project.

PITT SCHOOL ROAD AT-GRADE CROSSING

DOT# 751254M, RR MP 65.86 Martinez Sub

Per FRA Inventory: 1,195 ADT as of 2016, 15% trucks, No school busses, No emergency services

CAP Tier 3, No CAP recommendations

5-year Incident Data:

- 2 FRA reportable incidents
    - 11/30/2020 – Train struck unoccupied vehicle
    - 7/7/2017 – Fatal accident where motorist drove around descending/down gate and stopped on track
- 11 Broken Gate reports
- City provided collision data and safety analysis report shows 0 accidents in vicinity of crossing

This crossing is under County jurisdiction, and, as such, close coordination is needed with the County.

Significant residential growth is projected in the next 5 years, driving the need for roadway infrastructure improvements.

There is an ongoing County project at this location to remedy unauthorized changes to the crossing layout made by the County. These changes include existing turn-lane restriction and other geometric changes. A diagnostic for that project was held October 20th, 2020.UPRR noted that the existing layout (as modified by the County) likely creates a geometric problem with trucks which is likely causing them to hit the traffic control devices.

The long-term plan as noted by the City may include a closure of this crossing. Per the CPUC if this crossing is closed, approvals for the Parkway Boulevard overcrossing may be facilitated through the GO-88B crossing modification procedure which can be facilitated within a shorter time period. If the crossing remains open, a lengthy formal application process will be required for Parkway Boulevard which may take up to 18 months.

Short Term Recommendations:

- NB and SB W10-1 to be replaced with 36" signs and placed adjacent RXR pavement marking per CA MUTCD
- NB and SB stop bars to be updated to be 24" white limit lines 8ft upstream the nearest (most upstream) RR Flasher per CA MUTCD
- EB & WB W10-2 to be installed per CA MUTCD
- Existing curb protecting SB device (in pork chop island) does not appear to be 6" tall – Curb to be reinstalled or edge of lane striping to be established at 9'-3" from the centerline of the device
- County to clear existing culvert north of crossing between the tracks and Porter Rd.
- County to replace damaged delineators in vicinity of crossing and intersection
- County to consider refreshing pavement markings (stop pavement markings, stop lines, edgelines, RxR markings, etc.) with reflective markings to improve lane delineation in low light conditions – striping to be maintained to concrete crossing panels
- County to consider placement of W10-12 (skewed crossing) signs for NB and SB traffic
- County to consider installation of Short Storage Sign for NB Traffic, considering the truck crossing users.
- County to consider adding illumination near crossing
- County to provide better channelization for SB and EB traffic and/or limiting the EB to SB turn movement. County to provide truck turning templates to confirm lack of conflict with proposed channelization.

- County to consider removing NB stop sign at intersection to reduce queuing on track due to short storage distance

Long Term Recommendations & Project Impacts:

It was noted by the City that Pitt School Road needs to remain open for construction of western embankment and possibly in later construction phases for the Parkway overcrossing as there will be thousands of truck trips to bring soil from the retaining pond area, approximately half a mile south of the site. UPRR proposes that the crossing could be converted to private use (by the City's contractor) during this phase of the work to remove conflicting general traffic movements and to control traffic across that crossing – further conversation is needed with UPRR regarding the overpass construction phasing.

With permanent closure of crossing the City or County to remove asphalt north of tracks to edge of Porter Road and extend the existing drainage ditch, removing the existing culvert. South of the crossing a cul-de-sac or barricade should be installed off UPRR ROW to limit general traffic, however, UPRR may request access to their ROW pending further plan development. UPRR will remove the crossing surface and traffic control devices at project costs.

School district representative noted that bike routes will be affected if Pitt School Road is closed, and such traffic should be facilitated on the proposed overpass structure and sufficient signage should direct that traffic accordingly.

Attendance Notes:

- At this point, Scott Alman made contact noting he was leaving the meeting.
- Upon review of Pitt School Road quadrants, parties agreed to meet at City parking lot off A Street. However, upon meeting at A Street, to be cognizant of County staff time it was agreed to re-convene at Pedrick Road to complete review of the crossings bordering the county ROW.

PEDRICK ROAD AT-GRADE CROSSING

DOT# 751248J, RR MP 69.37 Martinez Sub

Per FRA Inventory: 3,412 ADT as of 2016, 20% trucks, No school buses, No emergency services

CAP Tier 3, No CAP recommendations

5-year Incident Data:

- 0 FRA reportable incidents
- 9 Broken Gate reports
- City provided collision data and safety analysis report shows 1 vehicle collision at Vaughn/Pedrick intersection

City/County noted that Pedrick is an important route to the Fairgrounds, approximately three miles southeast of the Pedrick crossing, during special events which occur several times a year. Also, commute traffic is sometimes routed along here by navigation apps to avoid congestion on I-80. Crossing users include mixed use trucks, including farm vehicles.   It was further mentioned that 1,200 new homes are planned for the area.

The City's ultimate plan is to include an overpass at this location although the timeframe and funding for such a project is unknown. An underpass alternative was briefly discussed by the diagnostic team, but underpasses are not currently allowed by UPRR due to service impacts and construction complexity. As an interim condition the City proposed to add pedestrian facilities perpendicular to the track as well as potentially add additional lanes for vehicular traffic.

Short Term Recommendations:

- NB and SB W10-1 to be replaced with 36" signs and placed adjacent RXR pavement marking per CA MUTCD
- NB and SB stop bars to be updated to be 24" white limit lines 8 ft upstream the nearest (most upstream) RR flasher device per CA MUTCD
- City to remove vegetation blocking W1-4 in NW quadrant for EB traffic
- City to consider refreshing pavement markings/striping with reflective markings/striping (stop lines, edgelines, RxR markings, etc.) to improve lane delineation in low light conditions – striping to be maintained to concrete crossing panels
- City to consider placement of W10-12 (skewed crossing) signs for NB and SB traffic
- City to consider adding illumination near crossing
- City to consider illuminating W10-1 signage
- City to review temporary traffic control during rain events.   Diagnostic team noted the "road may flood" signs near the crossing and suggested that road closure at Vaughn may be appropriate to prohibit vehicle use of the grade crossing if the roadway past the crossing is flooded.

Diagnostic team discussed a near-term project where the city may add bike lanes across crossing using existing crossing surface and devices. Diagnostic team noted that the edge of travel way (to include the bike lane) must be 9'-3" from the centerline of the device or a curb must be established at 5'-3" from the centerline of the device per CA MUTCD and UPRR guidance.

Long Term Recommendations & Project Impacts:

Initial concept plan provided by County show the use of exit gates, however, diagnostic team noted that may not be the best application. Rather, to prevent gate go around, diagnostic team recommends use of a raised median. If no device is placed in the median there is no width requirement although it was noted that median may pose obstacle to farm equipment that uses this road and could be a hazard in foggy conditions.

If/when Pedrick is widened to 4 lanes, a flasher must be considered for each lane of travel – this can be accomplished using a shoulder mounted CPUC standard 9A device, or preferably (to UPRR) a median and shoulder mounted CPUC standard 9 device. For installation of a median device the raised median would need to be 9'-9" wide at minimum per CA MUTCD and UPRR guidance.

Under no circumstance shall the gate arm length exceed 32' although shorter gate arm length is preferred by UPRR for maintenance purposes.

UPRR noted that as vehicle travel lanes are added, UPRR reviews the proposal as if establishing a new at-grade crossing which would include a requirement for closures or mitigations elsewhere along the corridor. Further references can be found on UPRR's website.

UPRR noted that widening a crossing surface will require complete replacement of the crossing surface and track structure.

UPRR also requests that multi-use paths or sidewalks are not requested across the ROW until surrounding land use supports or requires such facilities AND there is other useful pedestrian infrastructure off of the ROW. It was observed that existing culverts would need to be accommodated in design for path or sidewalk and UPRR noted that culverts under the tracks may not have turns which limit inspection ability. Additionally, parallel portions of path or sidewalk should be kept off of UPRR ROW. UPRR to provide Guidance for Sidewalk Projects which show relevant design criteria.

Attendance Note:

- Anthony Adams made note that he had to leave the meeting due to other business after review of the Pedrick Road crossing.
- Lunch break was taken shortly after 12:30pm and all agreed to return approximately at 1:30pm.

VAUGHN ROAD AT-GRADE CROSSING

DOT# 751249R; RR MP 69.21 Martinez Sub

Per FRA Inventory: 2,734 ADT as of 2016 with 25% trucks and no school buses. FRA Inventory does not indicate a selection under "emergency services".

CAP Tier 3, No CAP recommendations

5-year Incident Data:

- 0 FRA reportable incidents
- 1 Rough Crossing report
- 5 Broken Gates reports
- 1 Blocked Crossing report
- City provided collision data and safety analysis report shows 1 vehicle collision at Vaughn/Pedrick intersection

Similar to Pedrick it was noted that commute traffic is sometimes routed to Vaughn by navigation apps to avoid congestion on I-80. It was again mentioned that 1,200 new homes are planned for the area. Trucks regularly use this crossing. Historically the crossing has had a lot of industrial traffic use. City also noted that the crossing is a location where the street/land use changes from urban to rural/agricultural, as noted by the farm equipment sign in the SE quadrant.

The City's long-term plan proposes to vacate the at-grade crossing of Vaughn Road. EB Vaughn will be realigned west of the crossing to connect to Pedrick north of the Pedrick Road at-grade crossing.

Short term recommendations:

- NB and SB (cardinal direction) W10-1 to be replaced with 36" signs and placed adjacent RXR pavement marking per CA MUTCD. W10-1s should be accompanied by W48(CA).
- NB and SB stop bars to be updated to be 24" white limit lines 8ft upstream the nearest (most upstream) RR Flasher device per CA MUTCD
- City to consider replacing pavement marking with reflective markings to improve lane delineation in low light conditions – Centerline and edge line striping to be maintained to concrete crossing panels
- City to verify that existing edge-line striping is 8'-3" from the EB traffic control device or install a 6" or 8" AC dike to maintain compliance with CA MUTCD regarding device setbacks.
- City to consider placement of W10-12 (skewed crossing) signs for NB and SB traffic
- City to consider adding illumination near crossing
- City to consider illuminating W10-1 signage

Long Term Recommendations & Project Impacts:

With permanent closure of crossing the City to remove asphalt east of tracks to edge of Pedrick Road. West of the crossing a cul-de-sac or barricade should be installed off UPRR ROW to limit general traffic, however, UPRR may request access to their ROW pending further plan development. UPRR will remove the crossing surface and traffic control devices at project costs.

Current concept proposals show a stop-controlled intersection for the realigned Vaughn Road (through traffic on Pedrick will not stop). The City also discussed the potential use of a roundabout but UPRR is generally not agreeable as roundabouts may cause spillback queuing across the at-grade crossing.

Attendance Notes:

- City's representative, Jordan Santos did not return to meeting due to other conflicts.
- Pejman Mehrfar, Daniel Santos, and Felix Ko each made contact noting they needed to leave the meeting as they had other commitments.

PROPOSED PARKWAY BLVD OVERCROSSING

Pending DOT# 176285B, RR MP 66.30 Martinez Sub

Diagnostic team viewed the site and proposed location from eastern embankment. Diagnostic team discussed general constructability topics (to include the use of Pitt School Road, above). It was noted that due to the high volume of trains there will likely be no more than one continuous hour at any time for general construction activity. Construction tasks which may take longer than an hour, such as setting girders, will require advance coordination.

School district representative noted that new bridge should be wide enough to allow bike lanes and sidewalks in both directions. Designer noted that potential cross section of bridge could allow for 4 vehicular lanes with multi-use path. The School District may send a letter stressing the need for bike lanes and sidewalks in both directions.

It was noted that 3000-4000 homes would be built over the next 5-10 years in the general area.

Attendance Notes:

- Hans Strandguard and Bob Sergeant, from TY Lin both notified parties and parted from the meeting.

WEST A STREET AT-GRADE CROSSING

DOT# 751253F;, RR MP 67.39 Martinez Sub

Per FRA Inventory: 8,370 ADT as of 2016, No school buses, No emergency services. City noted that there is currently school bus use – to be updated. Vehicular Traffic in both directions at the crossing was constant in this downtown area during the diagnostic meeting. Lots of pedestrians were also noted by the diagnostic team and confirmed as a regular occurrence by the City.

2015 Model CAP Tier 2, CAP recommendations:

- Add 'Keep Clear' pavement markings for EB and WB traffic
- Add vehicle detection for EB traffic
- Refresh EB and WB median line markings
- Add 'Do Not Stop on Tracks' signs, R8-8 for EB and WB traffic downstream of the crossing

UPRR discussed their past assessment of the traffic signal interconnection operations as memorialized by the report entitled 'Assessment of Interconnected Highway-Rail Grade Crossing' (Interconnect Report). The assessment was performed April 12th, 2012 by UPRR's traffic signal consultant, CTC, Inc., and include representatives from the City of Dixon and representatives from the CPUC. The assessment was conducted as a result of the October 1, 2010 FRA Safety Advisory 2010-02 regarding traffic signal interconnection with railroad preemption. UPRR will provide copy of the report and recommends that the interconnect and railroad preemption be updated with this project. The intersection of A Street and Adams is currently interconnected with the RR Signal System with simultaneous preemption. As summary the CTC recommendations in that report (for the Agency) are as follows:

- Immediate Recommendations:
    - Increase the track clearance green time from 10 seconds to 32 seconds – this was agreed to and changes were made on site in 2012.
- Short Term Recommendations:
    - Convert from all-red flash to limited service of non-conflicting movements with the railroad during preemption operation.
    - Restrict the left turn movement toward the track during preemption.
    - Restrict the right turn movement toward the track during preemption.
    - Implement a maximum preemption timing circuit.
    - Implement a Preemption Operation and Maintenance program.
- Long Term Recommendations:
    - Implement Advance Preemption Time to clear design vehicle.

5-year Incident Data:

- 0 FRA reportable incidents
- 6 Broken Gate reports
- 2 Blocked Crossing reports
- City provided collision data and safety analysis report shows 6 vehicle collisions at Porter-Adams/A Street intersection and 8 vehicle collisions at 1st Street/A Street . It was noted that vehicle collisions at either intersection may cause spillback queuing across the at-grade crossing.

The City's ultimate plan is to include an underpass at this location although the timeframe and funding for such a project is unknown. As an interim condition the City proposes to add pedestrian facilities perpendicular to the track to complete the gap in the sidewalks over UPRR ROW. The city also proposed to improve the vertical profile of the crossing.

Short Term Recommendations:

- EB and WB W10-1 to be replaced with 36" signs and placed adjacent RXR pavement marking per CA MUTCD. W10-1s should be accompanied by W48(CA).

- Existing curb protecting EB and WB devices do not appear to be 6" tall nor 4'-3" from the face of curb to the centerline of the existing device – Curbs to be reinstalled or edge of lane striping to be established at 9'-3" from the centerline of the device.

- NB Porter Rd leg nearest the tracks (eastern leg) in missing W10-4 signage per CA MUTCD. This approach should also a include low-clearance (W10-5) sign

- Diagnostic team recommends installing edge line striping – striping to be installed to concrete crossing panels.

- Due to non-standard design diagnostic team recommends posting sidewalk closure sign and redirecting pedestrian traffic to B St pedestrian undercrossing north of the at-grade crossings. If closure not possible diagnostic team recommends the same signage redirecting traffic and adding tactile warning devices, Look (R15-8) signs, and edge line striping to better separate motorists from pedestrians

- Diagnostic team recommends relocating wayfinding signage to reduce sign clutter and limit flasher visibility obstructions. It was further noted that the right arrows on the WB signs may confuse motorists into turning on the RR ROW or tracks.

- Diagnostic team recommends placing 15 MPH (W13-1P) plaque below low-clearance (W10-5) sign.

- Diagnostic team recommends restricting left turns out of Porter St eastern leg to reduce conflicting movements in the vicinity of the at grade crossing. City to consider adding W10-3 (RT) signs, RXR pavement markings and right arrow pavement marking.

- Diagnostic team recommends removing rail bollards in NW (RR NE) quadrant as they present hazard for motorists who may collide with them

- Diagnostic team recommends the City look to install additional lighting in the vicinity of the at-grade crossing.

Long Term Recommendations & Project Impacts:

UPRR noted that the Guidance for Sidewalk Projects should be consulted in the design of the sidewalk project. Furthermore, given the number of school traffic anticipated to use this crossing the diagnostic team recommends the use of CPUC standard 9 devices for pedestrians along with effective channelization.

Diagnostic team recommends that the Interconnection Report recommendations be reviewed and considered. Queue prevention using queue cutter traffic signals at the crossing should also be considered due to the distance between the adjacent traffic signals.

UPRR noted that widening a crossing surface will require complete replacement of the crossing surface and track structure.

Initial concept plan provided by County show the use of exit gates, however, diagnostic team noted that may not be the best application. Rather, to prevent gate go around diagnostic team recommends use of a raised median. (see Pedrick Road discussion)

Initial concept plan shows closure of the eastern leg of Porter Rd to direct traffic to the signalized intersection or Porter and West A – Diagnostic team recommends this be implemented. It was noted that the closure is necessary to facilitate approach grade improvements at the grade crossing.

Regarding the underpass UPRR does not allow underpass grade separation structures. UPRR states that every effort should be made to design and construct an overpass.

FIRST STREET (SR-113) AT-GRADE CROSSING

DOT# 751250K, RR MP 67.62 Martinez Sub

Per FRA Inventory: 11,440 ADT as of 2016, No school buses, No emergency services. City noted that there is currently school bus use and that was observed by the diagnostic team. School District to provide number of buses using the crossing daily. Vehicular traffic was constant at the crossing.

CAP Tier 3, CAP recommendations to be facilitated as part of on-going Section 130 project

5-year Incident Data:

- 1 FRA reportable incidents
  - 1 Vehicle on Track report
  - 6 Broken Gate reports
  - 3 Blocked Crossing reports

This crossing is under Caltrans jurisdiction, and, as such, close coordination is needed with Caltrans.

The City is not proposing any additional short- or long-term improvements at this location.

Short Term Recommendations:

- It was noted that the on-going Section 130 project will bring crossing signage and striping to MUTCD compliance as well as provide pedestrian facilities. The project also will include exit gates as a median was determined to be not feasible by that diagnostic team.

- Diagnostic team recommends the City look to install additional lighting in the vicinity of the at-grade crossing.

- Diagnostic team recommends City work with Caltrans to extend painted medians to concrete crossing panels

- Diagnostic team recommends City consider restricting left turns from the driveway in the NW quadrant thru signage and a double-yellow striped median) to reduce possibility of vehicle collisions and subsequent spillback queuing

- It was noted that sightlines for NB traffic are obstructed due to crossing geometry

- There was discussion regarding relocating pedestrian crossing and Rectangular Rapid Flashing Beacon (RRFB) to B St intersection as existing crosswalk can cause spillback queuing across the at-grade crossing. The school district expressed concerns about this suggestion.

Technical Findings Memorandum

To: Deborah Barr, P.E., City Engineer, City of Dixon

From: Andrew Maximous, P.E., T.E.

Subject: Dixon Area Advanced Traffic and Railroad Safety Study Report

Date: October 11, 2021

1.0 Introduction

Per UPRR's request, RailPros has reviewed DKS's Dixon Area Advanced Traffic and Railroad Safety Study Report dated August 2021. The report was commissioned by the City of Dixon due to public concerns following recent fatal incidents at the Pitt School Road and 1st Street grade crossings in 2017 and 2019, respectively. The report provides an overview of existing traffic operations, summary of proposed rail crossing projects, crossing improvement recommendations, and future year (2040) traffic analysis along UPRR's Martinez subdivision corridor within the City of Dixon, CA.

It should be noted that UPRR has not endorsed or approved the recommendations and conclusions of any of the future projects described in the report. As each crossing project moves forward, UPRR respectfully requests that the City of Dixon continue to consult and partner with UPRR in this process.

Section C of the Dixon Area Advance Traffic and Railroad Safety Study Report (DKS Traffic Analysis Memorandum) dated May 29, 2021 analyzed three future traffic scenarios, described below. Each scenario was modelized in Synchro and utilized AM and PM peak traffic movement counts collected by the City in 2019 for their general plan update.

Baseline Scenario – Includes network and land use assumptions consistent with analyses conducted for the most recent General Plan update, including the Vaughn Road realignment; the Parkway Boulevard overcrossing project; and widening segments of Pedrick Road, Vaughn Road, and Parkway Boulevard to four lanes; among other projects.

Scenario A – Includes all the Baseline Scenario network assumptions (including widening of Pedrick Road, Vaughn Road and Parkway Boulevard) except for the Vaughn Road realignment and Parkway Boulevard overcrossing project.

Scenario B – Includes all the Baseline Scenario network assumptions, including Vaughn Road realignment and Parkway Boulevard overcrossing project plus the A Street undercrossing and a closure of the at-grade railroad crossing at Pitt School Road (closure of the south leg of Pitt School Road at Porter Road).

This memorandum outlines technical findings after a thorough review of the DKS Study Report.

2.0 Review of Proposed Crossing Improvements

The five grade crossing locations within the City of Dixon are shown in **Figure 1**. **Table 1** summarizes the average daily traffic (ADT) at each of the grade crossings. The ADT values reported on the FRA Inventory

Form is from data collected in 2016. It is requested that the City include the ADT data collected in 2019 in the appendix of the DKS study and provide to the CPUC to inform the FRA.

The crossing numbers shown in **Table 1** correspond to the crossing location numbers shown in **Figure 1**.

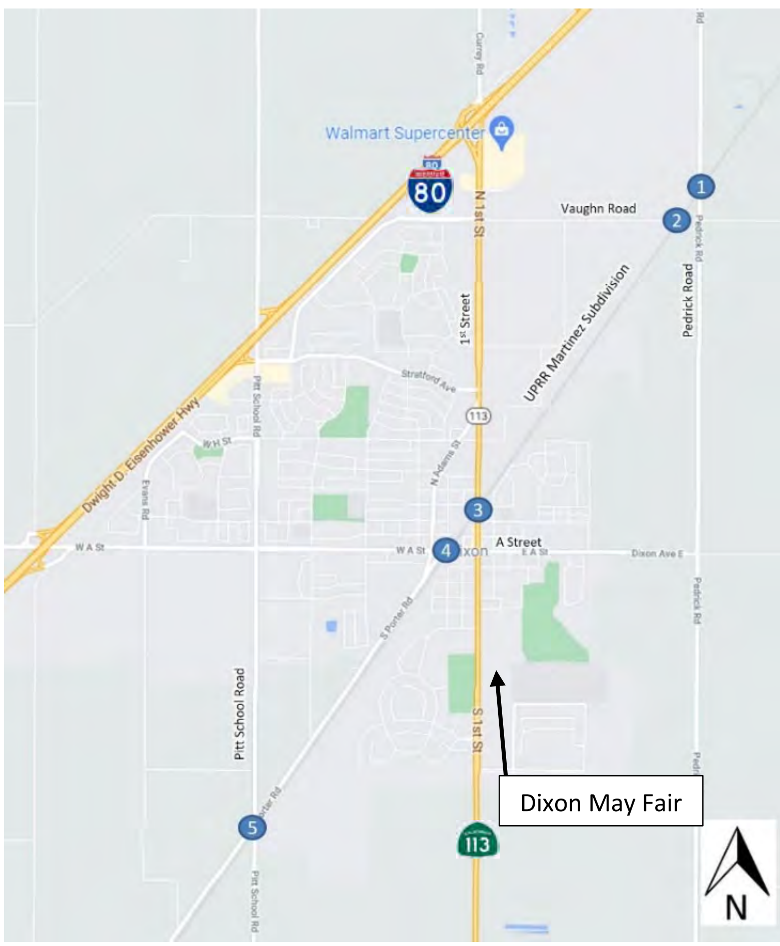
Table 1 – Average Daily Traffic by Grade Crossing

#	Crossing Name	DOT#	ADT (2016)*
1	Pedrick Road	751248J	3,412
2	Vaughn Road	751249R	2,734
3	1st Street	751250K	11,440
4	A Street	751253F	8,370
5	Pitt School Road	751254M	1,195

** From FRA Inventory Form – Data taken in 2016*

Diagnostic field meetings were held on April 19, 2021, to review the grade crossings and were attended by the City of Dixon, County of Solano, Dixon Unified School District, CPUC, and UPRR. Meeting minutes are still in progress and still need to be reviewed and accepted by all parties involved prior to finalizing.

Figure 1 – Grade Crossing Location Area



Source of base map: Google Maps

2.1 Pedrick Road (DOT# 751248J)

Pedrick Road is classified as a 2-lane arterial roadway with a 55 mph posted speed limit. It intersects I-80 approximate 1.25 miles north of the grade crossing and, as such, is frequently used by commuters and as an alternate route to the Dixon May Fair. Per the FRA Inventory this double track grade crossing has an average of 40 trains/day and a maximum train speed of 79 mph.

The report outlines the following improvements to the grade crossing:

- Short-term - Construct Class I multi use path or Class II bike lane across the west side of the crossing, see **Figure 2**. (short-term)
- Short-term - Update signs and markings to meet CA-MUTCD standards (short-term)
- Consider crossing elimination via roadway overcrossing (long term)

Figure 2 – Pedrick Road Proposed Improvements

Source: DKS - Dixon Area Advanced Traffic and Railroad Safety Study Report; August 2021

Per the diagnostic meeting, the City should also consider:

- Installation of quad gates and/or raised medians at this location to reduce the potential of motorists driving around the RR gates. (Raised medians are preferred by UPRR and CPUC).
- Installation of street lighting within 50’ of the grade crossing.

The report also detailed possible pedestrian and cyclist improvements as shown in **Figure 2.** A channelizing railing is detailed as part of this plan. Per UPRR standards, all channelizing devices must be no taller than 36” high at a grade crossing. See attached UPRR Pedestrian Guidelines for further reference.

2.2 Vaughn Road (DOT# 751249R)

Vaughn Road is classified as a 2-lane arterial roadway with a 45 mph speed limit and is part of the Dixon-Davis bikeway path. The intersection of Vaughn Road and Pedrick Road is approximately 475' east of the double track Vaughn Road grade crossing. Per the FRA Inventory Form, the Vaughn Road grade crossing has an average of 40 trains/day with a maximum train speed of 79 mph.

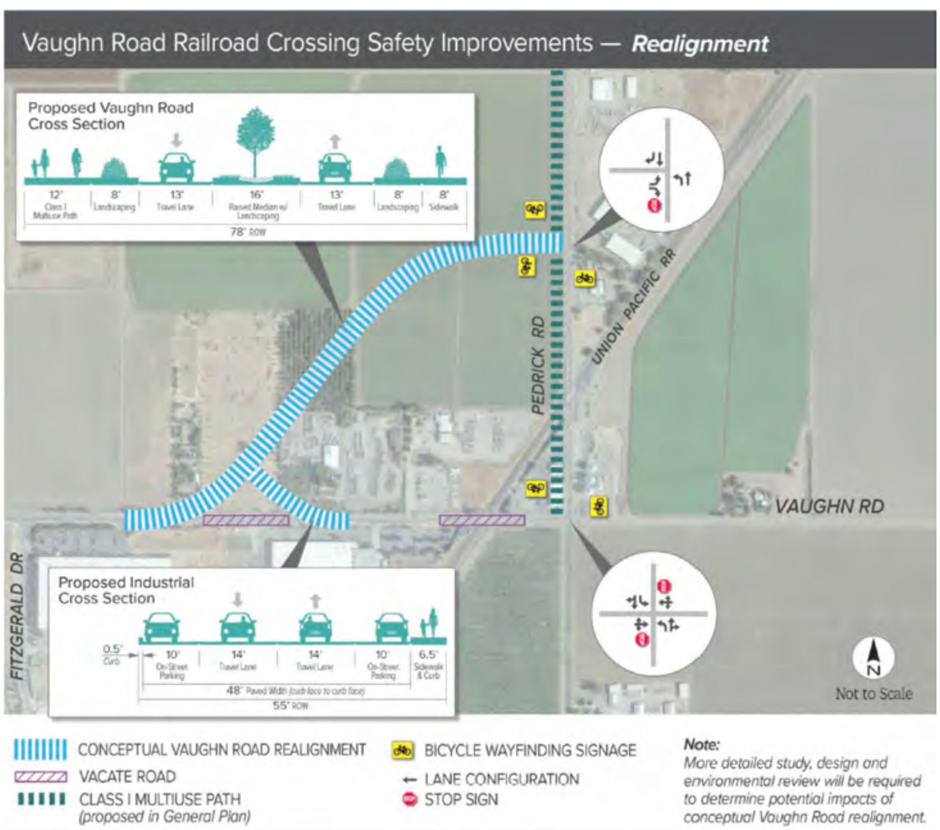
The City's report details the realignment of Vaughn Road which includes the Vaughn Road grade crossing closure (see **Figure 3**). UPRR is supportive of the crossing closure but does not support the proposed optional roundabout control for new intersection of Vaughn Road/Pedrick Road due to potential SB spillback queuing towards the Pedrick Road grade crossing. In addition, crossing closure plans should ensure that access to UPRR ROW is provided for UPRR maintenance vehicles.

They City's report should further examine the alternate route for the existing Dixon-Davis bikeway path on Vaughn Road. The future intersection of Vaughn Road and Pedrick Road should take into consideration right of way control and also guidance for all crossing users to ensure an effective closure of the Vaughn Road grade crossing.

Per the diagnostic meeting, it is recommended that the City:

- Update signs and markings to meet CA-MUTCD standards (short-term)
- Remove the vegetation obstructing the W1-4 sign in the northwest quadrant (short-term)

Figure 3 – Vaughn Road Proposed Improvements



Source: DKS - Dixon Area Advanced Traffic and Railroad Safety Study Report (August 2021)

2.3 1st Street (DOT# 751250K)

Within the City of Dixon, 1st Street is owned and maintained by Caltrans as SR-113, has a posted speed limit of 25 mph, and is classified as an arterial roadway in the City of Dixon general plan. At the double tracked 1st street grade crossing, there are 2 vehicle lanes with 40 trains/day and a maximum train speed of 79 mph. A fatality involving a train and a pedestrian occurred at the grade crossing in 2019. Crossing improvements including exit gates, sidewalks, and pedestrian flashers were recently completed in 2020 through a Section 130 project. See **Figure 4** for a photo showing the recent improvements.

The Dixon Area Advanced Traffic and Railroad Safety Study Report outlines the following proposed improvements to the grade crossing:

- Relocate the RRFB pedestrian crosswalk on 1st Street from C Street to B Street (short-term)
- Additional overhead lighting (short-term)
- Simplify signage near the crossing (short-term)
- Extend painted medians to crossing panels at both approaches (short-term)

The signalized intersection of A Street/1st Street is approximately 900' south of the 1st Street grade crossing. The Synchro output (attached to the DKS Traffic Analysis Memorandum) in the Baseline and Scenario A traffic conditions during the PM peak show that southbound queues extending from the intersection are likely to extend further than 500'. It is recommended that a more detailed queuing analysis is performed to better understand potential impacts to the 1st Street grade crossing.

The City's Study Report does not recommend any future grade separation improvements along 1st Street. The 1st Street corridor is a major north/south connection for the region and carries the highest amount of vehicle traffic within the City. It is recommended that the City partner with Caltrans to consider the creation of a Project Study Report (PSR) for an overcrossing and grade crossing closure as a long-term transportation improvement project. UPRR is fully supportive of any future 1st Street overcrossing project.

In addition, it is recommended that the City consider:

- Restricting turns at driveways at the southeast and northwest quadrants of the crossing to reduce potential queuing on tracks, per the diagnostic meeting.

Figure 4 – 1st Street Existing Conditions (April 2021)

2.4 A Street (DOT# 751253F)

A Street is classified as a 2-lane arterial roadway with a posted speed limit of 25 mph and steep asphalt roadway approaches to the grade crossing. The signalized intersection of A Street/Adams Street/Porter Street is approximately 340' west of the A Street grade crossing. The signalized intersection of A Street/1st Street is approximately 600' east of the A Street grade crossing. Per the FRA Inventory Form, the double tracked A street grade crossing averages 40 trains/day with a maximum train speed of 79 mph.

The report outlines the following improvements to the grade crossing:

- Implement advance preemption for traffic signal at A Street/Adams Street/Porter Street (short-term)
- Convert from all-red flash to limited service of non-conflicting movements with the railroad during preemption operation (short-term)
- Restrict turning movements toward the track during preemption (short-term)
- Update signs and markings to meet CA-MUTCD standards (short-term)
- Enhance overhead street lighting at the grade crossing (short-term)
- Implement bike/ped sidewalk enhancements (as shown in **Figure 5**) (short-term)
- Repave and regrade asphalt roadway approaches to the grade crossing to mitigate profile concerns (short-term)
- Close Porter Street access to Street St just west of the crossing (short-term)
- Restrict northbound left turns at the Jackson Street /A Street intersection
- Consider crossing elimination via roadway undercrossing (long term)

UPRR does not support the proposed long-term undercrossing project mentioned in the report. It is recommended that any crossing elimination project specify a roadway overcrossing.

The report also detailed possible pedestrian and cyclist improvements as shown in **Figure 5**. A channelizing railing is detailed as part of this plan. Per UPRR standards, all channelizing devices must be no taller than 36" high at the grade crossing. See attached UPRR Pedestrian Guidelines for further reference.

The report mentions re-designing the multiuse path during a future phase such that it would cross the track at a skew. UPRR recommends that all pedestrian and bicycle crossings should cross the tracks as close to 90 degrees as possible.

The B Street pedestrian undercrossing is 400' northeast of the A Street grade crossing. Per the diagnostic meeting, it is recommended that the City consider:

- Installing wayfinding signs to encourge pedestrians to use the B Street undercossing.

Figure 5 – A Street Proposed Improvements

Source: DKS - Dixon Area Advanced Traffic and Railroad Safety Study Report (August 2021)

The DKS Traffic Analysis Memorandum indicates that traffic Scenario A would shift a "minor" amount of traffic to the A Street grade crossing. At the A Street/1st Street intersection, the DKS memo Synchro files memo show 424 vehicles turning towards the crossing in the AM peak, and 520 vehicles in the future 2040 AM peak for Scenario A. Given the Synchro data in the AM peak and the queuing towards the grade crossing in the westbound direction during the PM peak observed at the diagnostic meeting, it is recommended that the installation of a westbound queue cutter traffic signal be considered to prevent vehicles from queuing on the tracks.

The intersection of Jackson Street/A Street located 330' east of the grade crossing is forecasted to operate at LOS F with future (2040) traffic volumes. The DKS memo analyzed three operational changes to the intersection including restricting the northbound left turn, converting the intersection to all-way stop control, and installing a traffic signal. UPRR supports restricting the northbound left turn alternative as signalization or all-way stop control would likely result in eastbound queuing impacts at the A Street grade crossing.

2.5 Pitt School Road (DOT# 751254M)

Pitt School Road is an arterial 2 lane roadway with a posted speed limit of 45 mph and is part of the Vacaville-Dixon bikeway route. The all way stop controlled intersection of Pitt School Road/Porter Road is approximately 75' north of the Pitt School Road grade crossing. Per the FRA Inventory Form, this double track grade crossing averages 40 trains/day with a maximum train speed of 79 mph. Two FRA reportable fatalities have occurred at this grade crossing in 2017 and 2020.

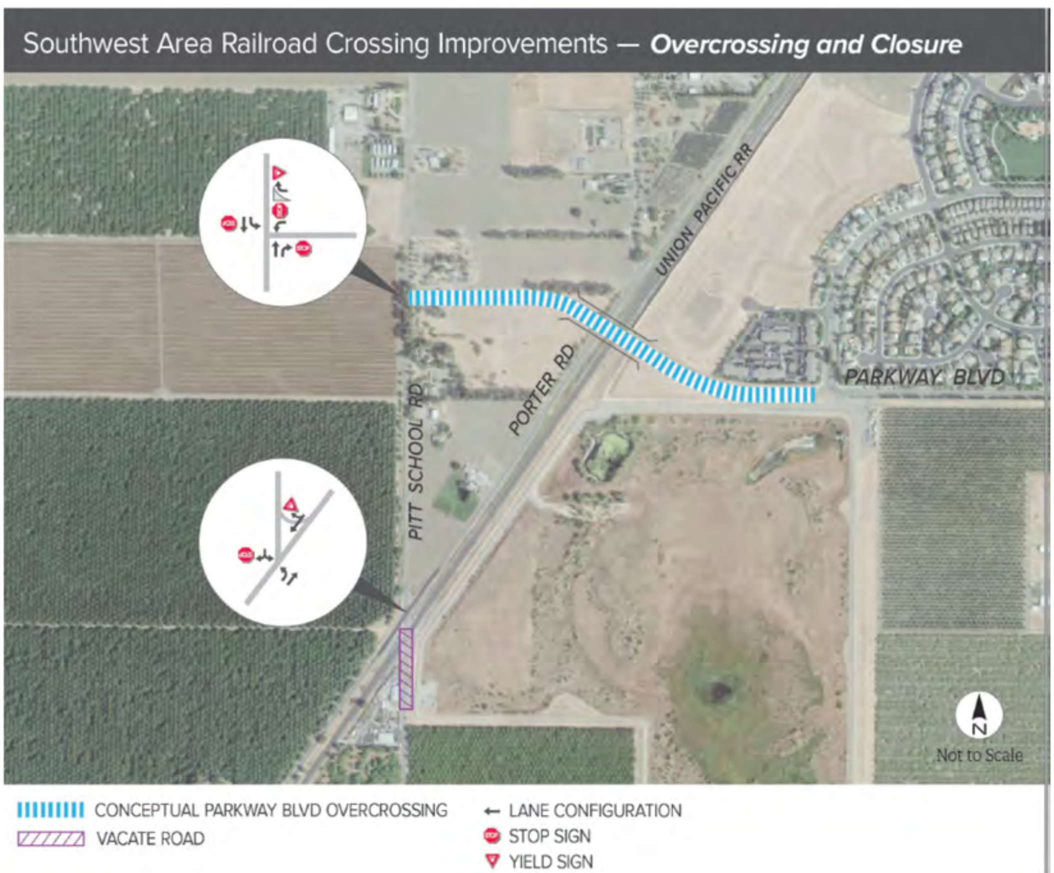
Per the diagnostic meeting, it is recommended that the City:

- Update signs and markings to meet CA-MUTCD standards (short-term)
- Conduct truck turning template analysis for the eastbound right turn movement towards the tracks (short-term)

It was noted at the diagnostic meeting that the RR gates have been broken 11 times in the last five years possibly related to recent intersection changes by the County that were not vetted with CPUC and UPRR.

UPRR supports the Parkway Boulevard overcrossing project and related Porter Road crossing closure shown in **Figure 6**. The plans for the overcrossing need to identify the alternate route of Vacaville-Dixon Bike Route.

Figure 6 – Pitt School Road Proposed Improvements



Source: DKS - Dixon Area Advanced Traffic and Railroad Safety Study Report (August 2021)

Conclusion

The DKS Dixon Area Advanced Traffic and Railroad Safety Study Report identified several short-term and long-term improvements at each of the five grade crossings within the City of Dixon. However, several items discussed by the diagnostic team at the diagnostic meeting were not include in the report. In addition, this Technical Findings Memorandum has identified key concerns with DKS Study Report that should be addressed in the Safety Study Report by the City to further progress coordination with UPRR.

These key concerns include:

- Inclusion of roundabout control for the future intersection of Vaughn Road/Pedrick Road
- Preform a more detailed queuing analysis and investigate the potential need for a westbound queue cutter traffic signal at the A Street grade crossing to prevent vehicles from queuing on the tracks.
- Inclusion of a long-term 1st Street overcrossing improvement and grade crossing closure project in partnership with Caltrans
- Change designation of A Street long-term improvement from an undercrossing to an overcrossing

The DKS Traffic Analysis Memorandum dated May 29, 2021 analyzed three future traffic scenarios. UPRR prefers the assumption and traffic analysis performed under Scenario B. This scenario includes the closure of the Pitt School Road grade crossing and results in less traffic redistribution to the other grade crossing within the City.

UPRR requests that consolidated meeting minutes be provided to the diagnostic team for review and acceptance by all parties to be finalized. The meeting minutes are the best way to document each parties' respective position at each location independent of the City's conclusions. Action items for each crossing noted in this memo should be included in the final minutes.

Per the diagnostic meeting minutes, a new diagnostic meeting will be required for each crossing as each project progresses and the scope of work is better defined.

Furthermore, UPRR requests that this Technical Findings Memorandum be included as an attachment to the final Dixon Area Advanced Traffic and Railroad Safety Study Report presented to the Dixon City Council.

Attachment – UPRR Guidance Document for Pedestrian Treatments

1. Vehicular device with gate arm.
Standard: MUTCD 8C.02 & 8C.04

2. Min. 2' Detectable warning strip.
Standard: MUTCD 8D.04

3. Min. 3' from edge of traveled way including shoulders or sidewalks.
Standard: UP Standard Drawing 0304J

4. 24" STOP LINE - 8' in advance of nearest Railroad Traffic Control Device.
Standard: MUTCD 3B-16

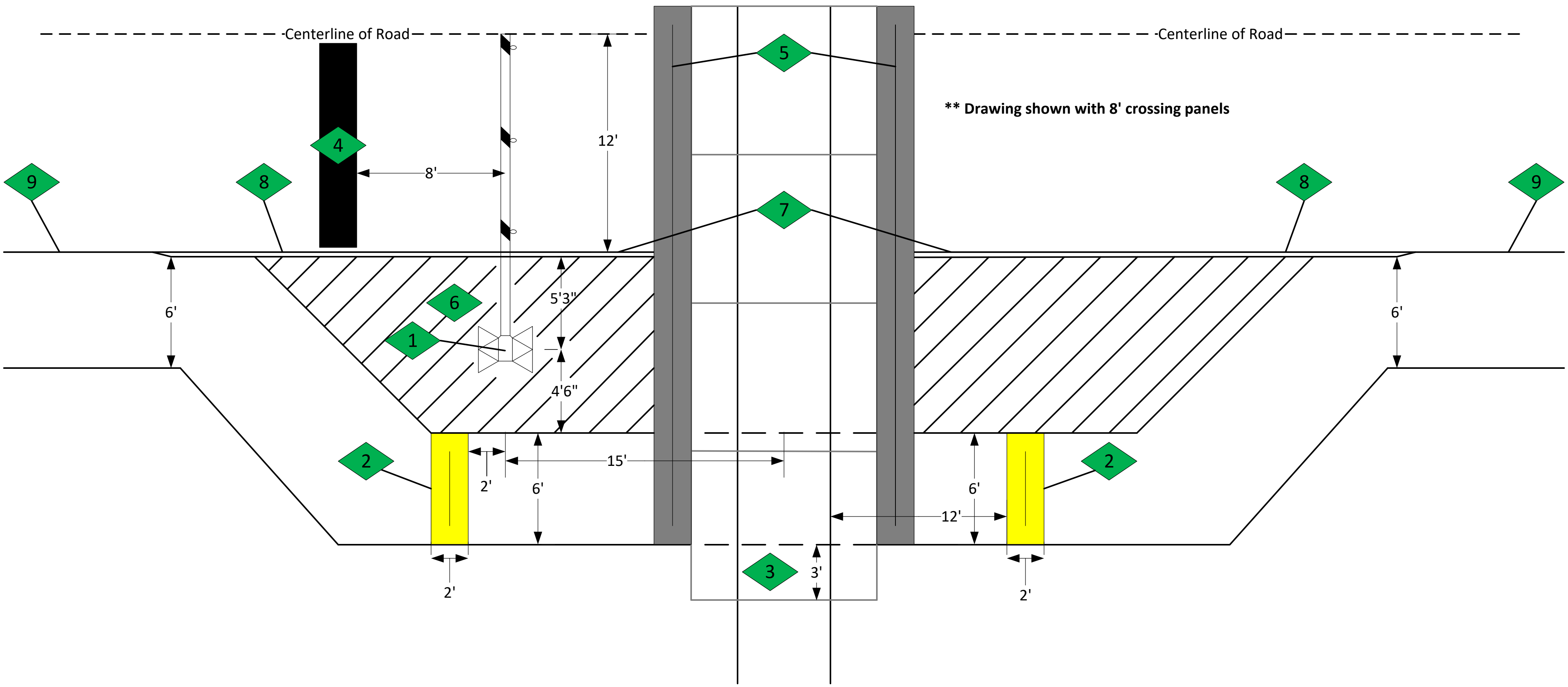
5. Min. 24" strip of asphalt between crossing surface and roadway.
Standard: UP Standard Drawing 0304J

6. Unpaved area – e.g. aggregate material around devices for maintenance access. Guidance: UP Maintenance

7. Min. 10' from center of track, tapered curb.
Guidance: Standard Practice

8. 6" non-mountable raised curb.
Standard: MUTCD 8C-01

9. Mountable curb for maintenance access..
Guidance: UP Maintenance



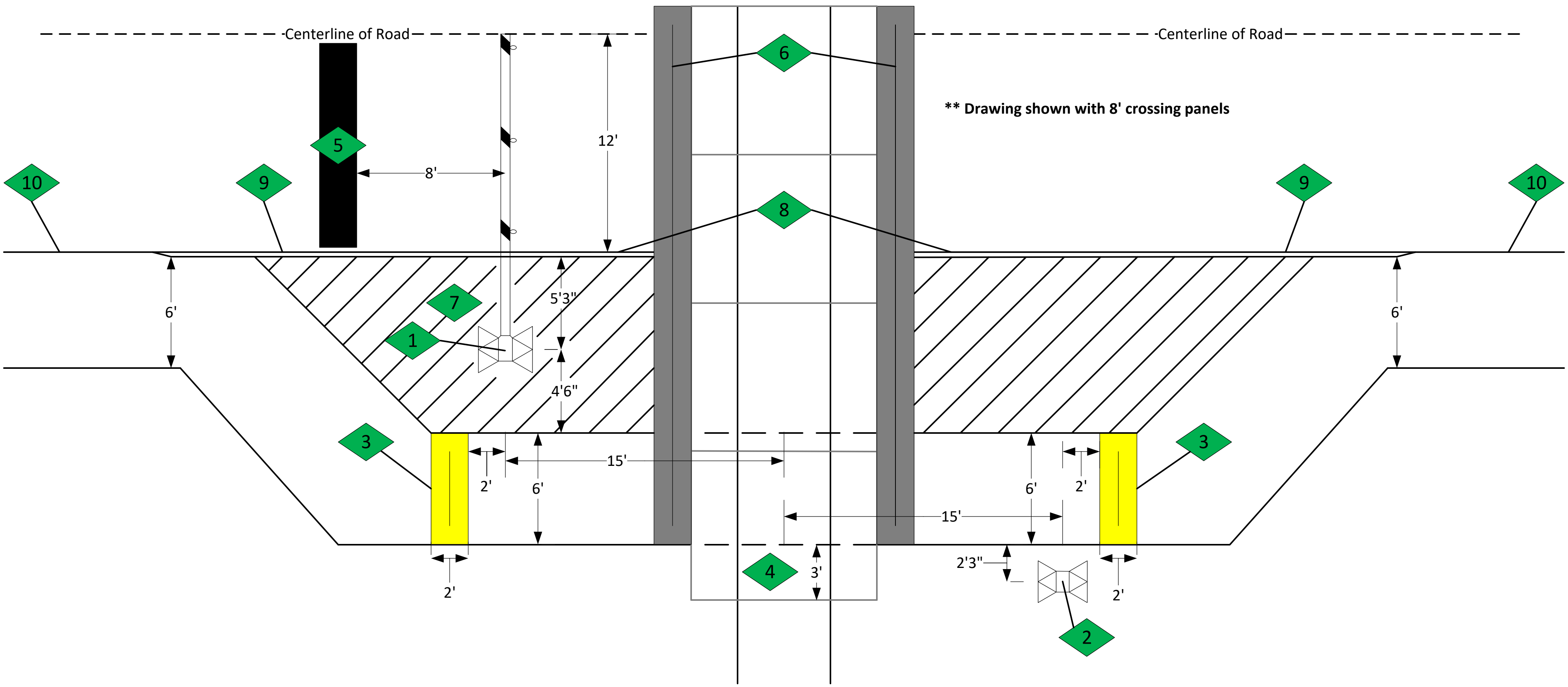
Guidance for Sidewalk Improvements

Disclaimer: The purpose of this document is to provide the design engineer with the guidelines for sidewalk improvements. This does not substitute the design engineer's specifications for a specific project but provides the basis of the standards, which the design engineer shall follow.

***Drawing is not to scale**
Drawn By: Mark Forgues
UPRR Public Projects
Revised: 4/17/2020

1	Vehicular device with gate arm. Standard: MUTCD 8C.02 & 8C.04
2	Pedestrian device. Standard: MUTCD 8D.06
3	Min. 2' Detectable warning strip. Standard: MUTCD 8D.04
4	Min. 3' from edge of traveled way including shoulders or sidewalks. Standard: UP Standard Drawing 0304J
5	24" STOP LINE - 8' in advance of nearest Railroad Traffic Control Device. Standard: MUTCD 3B-16

6	24" min. strip of asphalt between crossing surface and roadway. Standard: UP Standard Drawing 0304J
7	Unpaved area – e.g. aggregate material around devices for maintenance access. Guidance: UP Maintenance
8	Min. 10' from center of track, tapered curb. Guidance: Standard Practice
9	6" non-mountable raised curb. Standard: MUTCD 8C-01
10	Mountable curb for maintenance access.. Guidance: UP Maintenance

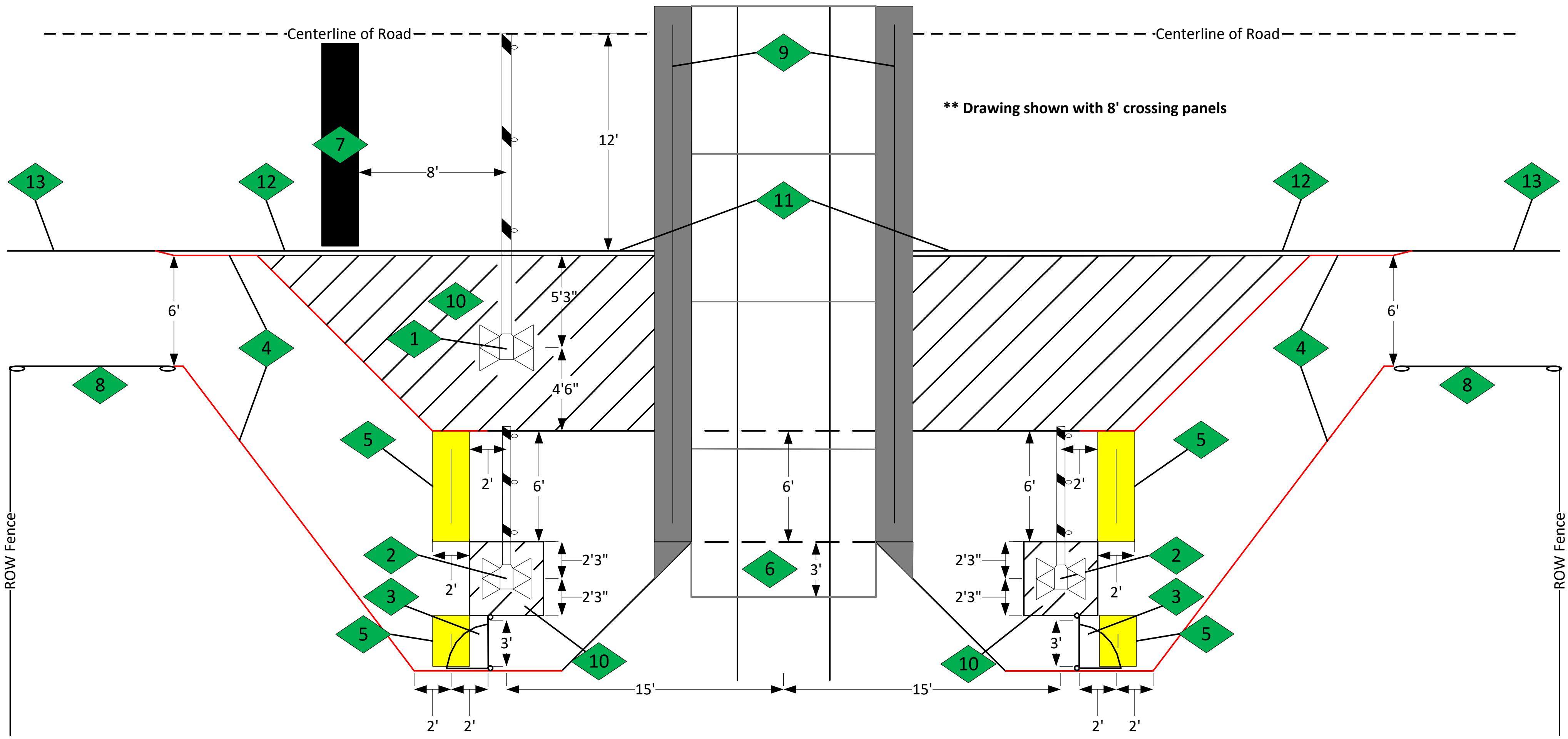


Guidance for Sidewalk Improvements w/ Off-Quadrant Pedestrian Device

Disclaimer: The purpose of this document is to provide the design engineer with the guidelines for sidewalk improvements w/ off-quadrant pedestrian device. This does not substitute the design engineer's specifications for a specific project but provides the basis of the standards, which the design engineer shall follow.

***Drawing is not to scale**
Drawn By: Mark Forgues
UPRR Public Projects
Revised: 4/17/2020

1	Vehicular device with gate arm. Standard: MUTCD 8C.02 & 8C.04
2	Pedestrian device with gate arm. Standard: MUTCD 8D.06
3	Pedestrian emergency exit gate. Guidance: Standard Practice
4	Pedestrian channelizing device – e.g. Steel tube rail. Installed no closer than 12' to CL. Guidance: UP Operation and Maintenance
5	Min. 2' Detectable warning strip. Standard: MUTCD 8D.04
6	Min. 3' from edge of traveled way including shoulders or sidewalks. Standard: UP Standard Drawing 0304J
7	24" STOP LINE - 8' in advance of nearest Railroad Traffic Control Device. Standard: MUTCD 3B-16
8	Gate to provide UPRR vehicle access for maintenance. Standard: UP Standard Drawing 0076B
9	24" min. strip of asphalt between crossing surface and roadway. Standard: UP Standard Drawing 0304J
10	Unpaved area – e.g. aggregate material around devices for maintenance access. Guidance: UP Maintenance
11	Min. 10' from center of track, tapered curb. Guidance: Standard Practice
12	6" non-mountable raised curb. Standard: MUTCD 8C-01
13	Mountable curb for maintenance access.. Guidance: UP Maintenance



Guidance for Sidewalk Improvements w/ Pedestrian Gates

Disclaimer: The purpose of this document is to provide the design engineer with the guidelines for sidewalk improvements w/ gate arms and emergency exit routes. This does not substitute the design engineer's specifications for a specific project but provides the basis of the standards, which the design engineer shall follow.

*Drawing is not to scale
Drawn By: Mark Forgues
UPRR Public Projects
Revised: 4/17/2020

SECTION F. UPDATED COST ESTIMATES

DKS Associates
1970 Broadway, Suite 740
Oakland, CA 94612
www.dksassociates.com

Project: Dixon Rail Safety Study - Planning Level Cost Estimate: North East Area
Date: October 6, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
Pedrick Road At-Grade Railroad Crossing Improvements							
1	Install Signage	LS	$ 5,000	1	$ 5,000	$ 4,000	
2	Install Striping	LS	$ 10,000	1	$ 10,000	$ 8,000	
	Enhanced Signing and Striping at Railroad Crossings				$ 27,000		
3	Multi-Use Perpendicular Crossing Concrete Path	SF	$ 20	1200	$ 24,000	$ 19,200	
4	Install Concrete Pad across Rail Tracks	LF	$ 2,000	220	$ 440,000	$ 352,000	Replace concrete pad
5	Install Light Pole and Foundation	EA	$ 10,000	2	$ 20,000	$ 16,000	
6	Excavation to remove asphalt pavement to continue ditch	LS	$ 25,000	1	$ 25,000	$ 20,000	
7	Install Metal Railing	LF	$ 75	120	$ 9,000	$ 7,200	
	Bicycle and Pedestrian Facility Improvements				$ 932,400		
	Pedrick Road At-Grade Railroad Crossing Improvements Total			$	960,000		
Vaughn Road Realignment							
1	Vaughn Rd Realignment	LS	$ 5,500,000	1	$ 5,500,000		Dixon CIP Estimate
	Vaughn Road Realignment Total			$	5,500,000		
Pedrick Road Grade Separation							
1	Pedrick Rd Grade Separation	LS	$ 25,000,000	1	$ 25,000,000		Based on Parkway Blvd Overcrossing cost estimate
	Pedrick Road Total			$	25,000,000		
*Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 40%							

DKS Associates
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Project: Dixon Rail Safety Study - Planning Level Cost Estimate: Central Area
Date: October 6, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
A Street At-Grade Railroad Crossing Improvements							
1	Install and Adjust Signage	LS	$ 5,000	1	$ 5,000	$ 4,000	
2	Install Striping	LS	$ 10,000	1	$ 10,000	$ 8,000	
3	Install Light Pole and Foundation	EA	$ 10,000	2	$ 20,000	$ 16,000	
4	Re-time signal to increase advance preemption	EA	$ 3,000	1	$ 3,000	$ 2,400	
	Enhanced Signing, Striping and Lighting at Railroad Crossings				$	68,400	
5	Remove Existing Pavement	LS	$ 10,000	1	$ 10,000	$ 8,000	
6	Regrade Pavement/tracks	LS	$ 50,000	1	$ 50,000	$ 40,000	
	Regrade Railroad Crossing				$	108,000	
7	Multi-Use Perpendicular Crossing Concrete Path	SF	$ 20	1800	$ 36,000	$ 28,800	
8	Install Concrete Pad across Rail Tracks	LF	$ 2,000	230	$ 460,000	$ 184,000	Replace concrete pad
9	Install Metal Railing	LF	$ 75	120	$ 9,000	$ 7,200	
10	Install Pedestrian Crossing Gates and System	EA	$ 75,000	4	$ 300,000	$ 240,000	
	Bicycle and Pedestrian Facility Improvements				$	1,265,000	
	A Street At-Grade Railroad Crossing Improvements Total			$		1,450,000	
Additional Central Area Improvements							
11	Install Mountable Curb (NBL restriction at Jackson)	EA	$ 2,000	1	$ 2,000	$ 1,600	
12	Relocate Existing RRFB	EA	$ 1,000	2	$ 2,000	$ 1,600	Hardware or re-timing signal
13	Install Flashing RRFB to existing poles	EA	$ 5,000	2	$ 10,000	$ 8,000	
14	Install Concrete Pedestrian Curb Extensions	EA	$ 15,000	4	$ 60,000	$ 48,000	
15	Install Concrete ADA Curb Ramps with Detectable Surface	EA	$ 8,500	4	$ 34,000	$ 27,200	
16	Install Light Pole and Foundation	EA	$ 10,000	1	$ 10,000	$ 8,000	
	Additional Central Area Improvements Total			$		213,000	
A Street Underpass							
1	A Street Grade Separated Underpass	LS	$ 35,244,000	1	-	$ 35,244,000	Escalated A St Study (2007) cost estimate to 2021 dollars
	A Street Underpass Total			$		35,244,000	

*Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 40%

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Project: Dixon Rail Safety Study - Planning Level Cost Estimate: South West Area
Date: October 6, 2021
Author: Bobby Sidhu
Note: All costs provided in 2021 dollars and represent high-level planning (1% design) cost estimates.

Cost Item No.	Cost Item Description	Unit	Unit Cost	Quantity	Subtotal	Soft Costs*	Additional Notes
Pitt School Road At-Grade Railroad Crossing Closure							
1	Install Signage	LS	$ 5,000	1	$ 5,000	$ 4,000	
2	Install Reflective Striping	LS	$ 10,000	1	$ 10,000	$ 8,000	
Pitt School Road At-Grade Railroad Crossing Closure Total				$ 27,000			
Parkway Boulevard Grade Separation							
1	Parkway Blvd - Grade Separated Overpass	LS	$ 25,000,000	1	$ 25,000,000		Parkway Blvd Estimate per TY Lin
2	Excavation to remove asphalt pavement to continue ditch	LS	$ 25,000	1	$ 25,000	$ 20,000	Lumped into Parkway Blvd
Parkway Boulevard Grade Separation Total				$ 25,000,000			
Soft Costs: Utility Coordination = 15% Mobilization = 10% Traffic Control = 15% Contingency = 40%							