M-83 Corridor Study

Frankenmuth, Michigan

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MDOT

Michigan Department of Transportation

Prepared By:

DLZ

DLZ Michigan, Inc.

MKSK

MKSK Studios, Inc.

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1.0 PROJECT BACKGROUND

1.1 Introduction

M-83 Downtown Frankenmuth

The M-83 Corridor Study was commissioned by the Michigan Department of Transportation (MDOT). The project study is focused on the M-83 corridor through the City of Frankenmuth (City) from Weiss Street to Tuscola Street (Figure 1). M-83 is a state trunkline owned and maintained by MDOT. M-83 is classified as a minor arterial road within the City. M-83 begins in Birch Run at the I-75/US-23 and Birch Run Road interchange, traveling east for approximately two miles, then turning north where in travels through the City of Frankenmuth. M-83 terminates approximately seven miles north of the City at M-15 (Vassar Road). M-83 primarily serves as a link between the I-75/US-23 and Birch Run Road interchange and the City of Frankenmuth.

The following intersections were included in the corridor study:

1. M-83/Weiss Street
2. M-83/Jefferson Street
3. M-83/Covered Bridge Lane
4. M-83/Zehnders-Bavarian Inn Pedestrian Crossing
5. M-83/Cass Street
6. M-83/Tuscola Street

1.2 Corridor Characteristics

Due to the varying characteristics in different parts of the corridor, the study was broken out into two individual segments for analysis. The segments include:

1. Segment 1 – Weiss Street to Jefferson Street
2. Segment 2 – Jefferson Street to Tuscola Street – Downtown Frankenmuth

At the Weiss Street intersection, M-83 is a two-lane roadway with 12-foot lanes and eight-foot paved shoulders. As M-83 travels north, it widens to 48 feet, with two 12-foot travel lanes in each direction. At the Jefferson Street intersection, M-83 has two travel lanes in each direction and a left turn lane. Within Segment 2, M-83 is mainly a four-lane roadway with two eleven-foot lanes in each direction. Northbound and southbound left turn lanes have been added at the Covered Bridge Lane intersection.

1.3 Project Purpose

The goal of the M-83 corridor is to identify potential corridor improvements to M-83 that will:

1. Accommodate the design year (2045) traffic volumes
2. Accommodate trucks
3. Meet the goals of the *Frankenmuth Complete Streets Plan* by:
    a. Enhancing safety and reducing crashes for all modes of transportation
    b. Accommodating all modes of transportation
    c. Improving non-motorized mobility and eliminating barriers for bicyclists/pedestrians with minimal impacts to traffic flow
    d. Increasing connectivity to Downtown
4. Provide context sensitive improvements that are consistent with community plans
5. Support economic development within the corridor

As described in the *Frankenmuth Complete Street Plan*, complete streets are *"Designed and operated to provide safe access for all users, including pedestrians, bicyclists, motorist and transit riders of all ages and abilities. A Complete Street Plan invites and relies heavily upon public engagement, conducts an inventory of available resources and analyzes resource capacities, creates a preliminary plan for discussion and then develops an implementation and active transportation plan. Complete Streets are customized for each community, providing the optimum configurations for transportation be it by car or truck, horse carriage or bicycle, on foot or on wheels."*

The outcome of the study is to identify short, medium, and long-term transportation system strategies to transform the corridor into a multi-modal environment that balances the needs of all modes and is sensitive to evolving land use and development.

M-83 at Weiss Street – Segment 1

M-83 Downtown Frankenmuth – Segment 2

1.4 Study Approach

The study included a corridor-wide data collection effort to obtain historical Average Annual Daily Traffic (AADT) volumes, intersection turning movement volumes (peak hour turning movements collected and provided by MDOT), traffic signal phasing and timings, crash data, right-of-way constraints, and road cross sections. The data collection effort relied heavily upon the inventory and analysis dashboard developed as part of the *Frankenmuth Complete Street Study* http://walkbike.info/frankenmuth/dashboard/. The dashboard provided an excellent database for existing conditions within the corridor by identifying existing bikeways, barriers, regional connections, activity centers, conflicts with roadways and other road-users, sidewalks, and pedestrian, running, and biking routes. The dashboard also identifies potential opportunities for medians, bikeways, and neighborhood routes.

As part of the data collection effort, field visits were conducted to identify any potential environmental, accessibility, and traffic issues and access management conflicts. Traffic generators, available resources, non-motorized facilities, roadways, and pedestrian paths and bikeways within and connecting to the study area were also identified.

Using the peak hour traffic volumes provided by MDOT, an analysis of key intersections and segments was completed. Crash data was analyzed to identify any crash patterns or locations with high crash rates. Any identified deficiencies in intersection and segment operations or crash patterns were further evaluated to develop mitigation measures to improve the operation or reduce crashes such as the installation of a signal, retiming of an existing traffic signal, lane addition, and/or geometric improvements, etc. One of the main tasks of the study was to determine if the existing four-lane cross section through the downtown area could be converted to three-lanes (i.e., “Road Diet”).

2.0 EXISTING CONDITIONS

A summary of the Existing Conditions is shown on Figure 1.

2.1 Crash/Safety Analysis

Crash data was analyzed for existing conditions utilizing five years of crash data (2013-2017) within the study area. Crash data was provided by the MDOT Bay City TSC. The crash analysis showed a total of 159 crashes within the study area over the five-year period. Of these crashes, there were no fatalities, eight-injury crashes, 20 possible injury crashes, three crashes involving pedestrians, zero crashes involving bicyclists, and 131 property damage only (PDO) crashes. Six crashes were alcohol/drug related. Over half (55%) of the crashes (88) occurred on Friday, Saturday, or Sunday.

Rear-end crashes are the highest occurring crash type throughout the corridor, comprising 44 percent of the total crashes. The second highest crash type is side-swipes from the same direction, comprising 17 percent of the total crashes.

The majority of segment crashes (non-intersection) are typically associated with curb cuts/driveways along M-83. These crash types and locations are typical of a commercial corridor with signalized intersections and numerous driveways.

The most significant pedestrian volumes occur at Covered Bridge Lane, the Zehnders-Bavarian Inn Pedestrian Crossing, and at Cass Street. The high pedestrian volumes at these locations are associated with weekend festivals and the large traffic generators located along this section of M-83. As noted in the crash summary there were three pedestrian/vehicle crash over the five-year study period. There is no discernable vehicle/pedestrian crash pattern based on the number of crashes and locations.

2.2 Right-of-Way Constraints

From Weiss Street to Christmas Lane, the road width of M-83 ranges from 24 to 58 feet. No sidewalks or paths are within this stretch of M-83. Development along this stretch is limited to two large commercial/tourist businesses with ample right-of-way. North of Christmas Lane the land use transitions to residential and the roadway narrows to 48 feet with a four-foot green strip and five-foot sidewalk. Right-of-way widths from Weiss Street to Jefferson Street range from 66 feet to 160 feet.

Within Segment 2, the roadway is 44 feet wide with a two-foot green strip and five to ten-foot sidewalk abutting parking lots and buildings for the majority of the segment. Throughout this segment, there is limited right-of-way available for roadway widening or non-motorized improvements. Any significant widening would require the removal of buildings, parking lots, retaining walls, landscaping, etc. Right-of-way from Jefferson Street to just north of the Cass river ranges from 71 feet to 86 feet.

Segment 1 – Christmas Lane to Weiss Street

Segment 1 – Christmas Lane to Jefferson Street

Segment 2 – Typical building locations immediately adjacent to public sidewalks

Segment 2 – Typical building locations immediately adjacent to public sidewalks

2.3 Non-Motorized Facilities

Sidewalks in the study area are generally in good condition with plentiful street lighting. Existing foliage and lighting provide a comfortable pedestrian experience. Throughout the Downtown, blocks are fairly short. Storefronts abutting the road, with parking in the rear, make the corridor visually appealing for pedestrians. However, the blocks become longer on the M-83 corridor towards Jefferson Street. Developments such as hotels and gas stations make the pedestrian experience less inviting, due to the multiple driveways and constant flow of cars entering and leaving those sites. Beyond Jefferson Street, sidewalks continue through a residential area to Christmas Lane and the commercial business located there. There are no sidewalks beyond Christmas Lane.

Non-Motorized Bridge Over Cass River

While the sidewalks surfaces are in fair condition, existing crosswalks throughout the area could be better maintained and be reinforced with clearer signage for both pedestrians and vehicles at intersections. Pedestrians need safe, visible points to cross just as much as drivers need to see where these points of crossing occur. Highly coordinated crossings of pedestrians and vehicles are vital on an arterial road bisecting a busy downtown.

Signalized Mid-Block Crossing

Highly coordinated crossings of pedestrians and vehicles are vital on an arterial road going through a busy downtown. Pedestrians need safe, visible points to cross just as much as drivers need to see where these points of crossing occur. Per the National Association of City Transportation Officials (NACTO), the average time a pedestrian is willing to walk to a crossing and wait for a signal is about three minutes. Current crosswalks are also extremely spread out; the distance between them varying from 350 feet to 1,200 feet. Considering this, and the distance between existing crosswalks, there is a clear gap (approximately 1,200 feet) in crosswalks between the Cass Street and Tuscola Street intersections as noted in Figure 2. This gap is also notable because of the three existing hotels on this block, a major source

of pedestrian traffic. This causes many pedestrians to illegally cross the street in between crosswalks, causing safety and traffic concerns.

In addition to sidewalks along the corridor, there is also a non-motorized bridge over Cass River and a non-motorized pathway between the river and Guzenhausen Street.

Access management is also of concern in regard to pedestrian traffic. Curb cuts and driveways that interfere with the sidewalk may cause hazardous conditions for pedestrians at crosswalks and mid-block. Additional curb cuts and driveways should take into consideration the impact they may have on conflicts with pedestrians and vehicles. Access management is explained further in the following section.

The public right-of-way has little to no bicycle facilities (lanes, bicycle parking, etc.) on M-83. As noted above, the right-of-way does have space constraints that make some bicycle facilities difficult to implement**.**

2.4 Access Management

Access Management is a process or program intended to ensure the major roadway systems will operate safely and efficiently through reduction of access points (i.e., driveways and curb cuts), spacing of traffic signals, and increasing cross-property connections, while adequately meeting the access need of abutting land uses and businesses along the roadway. The use of access management techniques is intended to increase roadway capacity, manage congestion, and reduce crashes. Access management provides several benefits including:

- Reduction in crashes
- Better communication and coordination between government agencies during development review and approval processes
- Maintaining and improving travel efficiency and access to-and-from businesses

Access management can be accomplished using a variety of techniques, depending on the situation, which include:

- Closure or consolidation of existing access points, where standards are not met, as part of street projects
- Gradual replacement of selected individual direct access points by combining access through rear service drives, parking areas, or shared driveways
- Establish standards to improve access systems where needed. For a change in use or expansion of an existing businesses to bring them into better conformance
- Ensure access for new developments meet the standards outlined below

A lack of an access management policy can result in a decrease in development due to poor aesthetics of the corridor for new business. A lack of an access management policy can also adversely affect roadway operations and safety by:

- Increasing crash rates
- Aiding in a greater number of conflicts and potential hazards between vehicles, bicycles, and pedestrians
- Diverting through traffic into abutting neighborhoods to avoid congestion
- Increasing congestion with slower travel speeds and delays to arterial traffic

Spacing and location of access points/driveways create several challenges and potential conflicts. Driveways that are too close to the intersection can create conflicts between vehicles making left and right turns, as well as pedestrians crossing the street. When driveways on opposing sides of the road are spaced too close together, conflicts between vehicles can occur. Driveways spaced too close together on the same side of the road can also cause conflicts.

Table 1 – MDOT Driveway Spacing Guidelines

Speed on Roadway (MPH)	MDOT Spacing Guidelines (feet)
25	130
30	185
35	245
40	300
45	350
50	455
55	455+

Source: MDOT Access Management Guidebook

Besides measurements, access management should also analyze crash maps to find where existing conflicts between vehicles already occur. In the project corridor, the main areas of concern for driveway conflicts are mainly in Segment 2. These include:

1. Cass Street intersection
2. Drives at the intersection of Jefferson Street
3. Drives near the intersection of Covenant Drive

Cass Street

This intersection accounts for the most crashes along the corridor, according to the crash study. A drive at the intersection of Cass Street and M-83 is positioned directly across from Cass Street. The drive provides access to the parking lots behind establishments along the East side of M-83. This access point exacerbates an already challenging intersection and can lead to more vehicular conflicts.

Jefferson Street

The Michigan Access Management Guidebook recommends at least 230 feet between the signalized intersection and a driveway. However, the northeast corner lot has an access drive within the 230 feet clearance distance from a signalized intersection.

Drives with access to the southeast corner lot of the intersection are also of concern. The drive on Jefferson Street is approximately 25 feet from the intersection, while the drive on M-83 is approximately 30 feet from the intersection. These are well within the 230 feet clearance distance from a signalized intersection.

The northwest corner lot also has a drive on Jefferson Street less than 230 feet from the signalized intersection.

Covenant Drive

This area is an unsignalized intersection with three private residential drives within 130 feet of the Covenant Drive and M-83 intersection. Three crashes have been recorded in this area.

2.5 Environmental Concerns (NEPA)

Any potential transportation improvements would need to consider the following National Environmental Policy Act (NEPA) issues relative to social, economic, and environmental (SEE) conditions:

- Noise impacts to sensitive noise receivers (residencies, parks, public institutions, etc.)
- Impacts to Section 4(f) properties
  - Historical properties, Frankenmuth Historic District
  - Parks (Cross, Willkommen, Zehnder)
  - Recreational facilities
- Farmland impacts
- Cass River impacts

Historic Site


Willkommen Park

3.0 TRAFFIC OPERATIONAL ANALYSIS

3.1 Capacity Analysis Methodology

To determine the existing traffic conditions along the M-83 corridor, a capacity analysis was conducted using the traffic modeling softwares SYNCHRO and SimTraffic. The model included the existing weekday PM and weekend PM peak hour turning movement counts, intersection geometry, and signal timings. A future traffic volume forecast for the year 2045 No-Build scenario was developed through applying a compound annual growth factor to the existing traffic volumes. In order to develop future growth rates for the project corridor, historic ADT counts, peak hour turning movement counts, local land use and zoning plans, local transportation plans, and information from the existing MDOT travel models for the area were reviewed and evaluated. Upon this review, future growth rates were developed. Based on direction provided by MDOT, the growth rates used to develop future (year 2045) traffic volumes were 0.5 percent per year for traffic north of Jefferson Street and 1.0 percent south of Jefferson Street. Therefore, to develop "base" 2045 No Build traffic volumes, the existing traffic volumes were increased by growth rates of 0.5 or 1.0 percent per year to the year 2045 (2018 to 2045).

The SYNCHRO (Version 10) and SimTraffic software programs from Trafficware, which are the most recent version of these softwares, were used for the analysis of operations at each of the study intersections and roadway segments. SYNCHRO is a macroscopic traffic analysis and optimization software tool that supports the *Highway Capacity Manual's* (HCM) methodology for intersection analysis (discussed below). This software tool was chosen for this study as it is widely used in the traffic engineering industry, and is also utilized by MDOT. SimTraffic, a microsimulation program packaged with SYNCHRO, was also utilized to evaluate LOS, delays, and queuing and blocking issues.

The determination of acceptable traffic operations at an intersection is typically based on the HCM Level of Service (LOS) calculated based using the methods of the Transportation Research Board *Highway Capacity Manual*, 2010 Edition. The HCM details methodologies for assessing the operational characteristics of various aspects of public roads and non-motorized facilities. These methodologies have been developed over 60 years based on empirical analyses and studies. HCM methodologies were utilized for this project and are based on travel delay experienced by users, which is then converted to LOS. The Federal Highway Administration (FHWA) also requires the use of HCM for projects that could involve Federal funding.

LOS is a qualitative measure that describes the quality of operating conditions within the traffic stream and the perception of motorists. The LOS of an intersection is based on the total delay experienced by vehicles waiting to travel through an intersection. The LOS is defined in terms of this total delay, as measured by the average number of seconds of delay per vehicle. Vehicle delay is a means of measuring factors such as driver comfort and convenience, safety, maneuverability, fuel consumption, and lost travel time. The LOS is based on a scale of "A" to "F", with "A" being the best situation. LOS "A" describes traffic operations with very low delay (i.e., most vehicles stop only the minimum amount necessary before entering the intersection). LOS "F" indicates very high delays with long queues of vehicles. In this case, the volume often exceeds the capacity of the intersection. Traffic is interrupted and impeded to the point that it can become "gridlocked" and the capacity of the road system is greatly diminished.

Table 2 summarizes the specific LOS criteria for signalized and unsignalized intersections as well as arterial segments.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersections	Unsignalized Intersections	Arterial Segment
	Average Control Delay (Seconds/Vehicle)		Average Travel Speed as a Percentage of Base Free Flow Speed (percent)
A	≤10	≤ 10	> 85
B	> 10 and ≤ 20	> 10 and ≤ 15	> 67 and < 85
C	> 20 and ≤ 35	> 15 and ≤ 25	> 50 and < 67
D	> 35 and ≤ 55	> 25 and ≤ 35	> 40 and < 50
E	> 55 and ≤ 80	> 35 and ≤ 50	> 30 and < 40
F	> 80	> 50	≤ 30

Source: Transportation Research Board, *Highway Capacity Manual*, 2010

3.2 SYNCHRO Results

Existing Conditions
Under the existing traffic and roadway conditions, all study area intersections operate at acceptable levels of service in the weekday and weekend PM peak hour. During the weekend PM peak hour, the westbound left turn from Weiss onto M-83 is predicted to operate at LOS F.

Future (Year 2045) No-Build Scenario
With the future traffic and the existing roadway configurations, all study area intersections operate at acceptable LOS in the weekday and weekend PM peak hours, with the following exceptions during the weekend peak:

- The eastbound left turn at Jefferson Street is predicted to operate at LOS F
- The westbound through and right turn at Jefferson Street is predicted to operate at LOS E
- The westbound left turn at Weiss is predicted to operate at LOS F

Future (Year 2045) Three-Lane Scenario
With the future traffic and the three-lane roadway configurations, all study area intersections operate at acceptable levels of service in the weekday and weekend PM peak hours, with the following exceptions during the weekend peak:

- The southbound left turn at Jefferson Street is predicted to operate at LOS F
- The westbound left turn from Weiss is predicted to operate at LOS F

SYNCHRO results are included in Appendix A.

After a detailed review of the SYNCHRO results, it was found that the SYNCHRO model was not effectively modeling the impacts of the high pedestrian volumes during the weekend peak hour. These pedestrian volumes may delay or inhibit northbound and southbound vehicles from making left/right turns onto the side streets. As noted by MDOT and the stakeholder committee, long delays and queues occur during the weekends at the signalized intersections as a result of the increased traffic and significant increase in pedestrian volumes for weekend events/festivals. The SYNCHRO model accounts for pedestrian volumes using a "Ped-Bike Adjustment" factor based on the number of pedestrians arriving at the intersection during the peak hour. This factor reduces the overall capacity of the intersection, but it does not take into

account vehicles being blocked along M-83 waiting for a gap in the pedestrian traffic and the resulting delays/queues. In order to account for the traffic impacts caused by the high number of pedestrians on the weekends, a more detailed microanalysis using SimTraffic analysis was conducted.

3.3 SimTraffic Results

Existing Conditions

The SimTraffic analysis showed that under the existing traffic and roadway conditions, all study area intersections operate at acceptable LOS in the weekday PM peak hour. During, the weekend PM peak hour, the eastbound left turn at Jefferson, southbound left turn at Covered Bridge Lane, and the westbound left turn at Weiss Street are predicted to operate at LOS F. Table 3 depicts LOS by movement for each intersection based on the SimTraffic results. The SimTraffic results are included in Appendix B.

The delay and LOS results reported throughout the remainder of this document are based on the SimTraffic microanalysis. The SimTraffic results for existing conditions are included in Appendix B.

Future (Year 2045) No-Build Scenario

The "No Build" scenario assumes that normal traffic growth occurs between 2018 and the year 2045, with no capacity modifications to the existing roadway network except for projects that are already identified/planned and likely to be built (note: it was assumed that for the "No Build" scenario, normal ongoing capital maintenance and road resurfacing/reconstruction projects would still occur consistent with MDOT and the City's capital improvement plan). Reviewing expected traffic operations of the existing network in the year 2045 based on anticipated traffic growth allows identification of potential future infrastructure needs that would not be apparent when only looking at existing traffic volumes. It is anticipated that signal operation modernization and optimization will occur by year 2045, and this is assumed for the No Build scenario.

In order to evaluate the operation of the study intersections and roadway segments for the future conditions (year 2045 No Build), the SYNCHRO model was updated to reflect conditions anticipated to exist in the year 2045.

With the future traffic forecast and the existing roadway configurations, all study area intersections operate at acceptable levels of service in the weekday PM peak hour. During the weekend peak hour, all study area intersections operate at acceptable levels of service with the following exceptions:

1. Overall Jefferson Street is predicted to operate at LOS E
    a. The eastbound approach at Jefferson Street is predicted to operate at LOS F
    b. The westbound approach at Jefferson Street is predicted to operate at LOS F
2. The southbound left turn at Covered Bridge Lane is predicted to operate at LOS F
3. Overall Weiss Street is predicted to operate at LOS D
    a. The westbound left turn is predicted to operate at LOS F
    b. The westbound right turn is predicted to operate at LOS E

Table 4 depicts LOS by movement for each intersection. The SimTraffic results for this scenario are included in Appendix C.

Table 3 – Existing Conditions Delay and Level of Service

Signalized Intersection	Weekday PM Peak Hour LOS/Delay (s/veh) Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	C	B		C	B		B	A	A	B	A	A	A
	26.2	18.8		23.9	19.7		12.5	7.9	3.4	12.5	4.7	2.6	9.3
M-83 & Covered Bridge Ln	B	C		B	B		B	A	A	C	B	A	A
	19.6	21.1		15.6	19.1		13.3	6.8	5.0	21.2	11.9	8.3	9.6
M-83 & Pedestrian Crossing								B			A		B
								11.3			9.6		10.5
M-83 & Rosstal St. / Cass St.		C			A		B		A		A	A	A
		24.6			8.3		16.2		8.8		3.6	2.5	6.8
M-83 & Tuscola St.		C			C		B		A	B		A	A
		21.9			22.9		10.3		5.4	10.7		7.3	8.3
M-83 & Weiss St.*				A		A		A	A	A	A		A
				8.6		4.1		0.5	0.2	2.8	1.1		1.5
Total Delay	436.0 (7.3 minutes)												
Signalized Intersection	Weekend PM Peak Hour LOS/Delay (s/veh) Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	EBL	C		C	D		B	A	A	B	A	A	B
	70.4	29.5		34.5	38.4		16.4	9.0	9.8	22.6	5.1	3.6	18.7
M-83 & Covered Bridge Ln	C	C		C	C		B	A	B	F	B	B	C
	25.6	20.8		32.8	24.7		19.4	9.9	23.1	129.9	13.3	11.7	22.6
M-83 & Pedestrian Crossing													B
								10.2			14.3		12.3
M-83 & Rosstal St. / Cass St.		C			D		C		B		A	A	A
		28.8			39.7		27.0		14.0		4.4	6.7	8.0
M-83 & Tuscola St.		C			C		B		A	B		A	A
		25.3			31.5		12.8		5.6	13.4		7.4	9.2
M-83 & Weiss St.*				F		C		A	A	B	A		C
				145.5		21.1		2.5	2.0	11.3	6.3		22.7
Total Delay	792.9 (13.22)												

*Unsignalized

Table 4 – No Build (2045) Delay and Level of Service

	Weekday PM Peak Hour LOS/Delay (s/veh) Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	C 28.0	B 18.8		C 24.6	C 23.0		B 18.8	A 8.3	A 6.2	B 15.4	A 5.7	A 4.3	B 10.9
M-83 & Covered Bridge Ln	B 18.8	B 16.6		B 19.6	C 22.6		B 15.0	A 7.1	A 6.6	C 25.5	B 12.2	A 9.3	B 10.3
M-83 & Pedestrian Crossing								B 11.0			A 8.5		A 9.8
M-83 & Rosstal St. / Cass St.		C 22.8			A 17.0		B 17.0	A 9.0			A 3.5	A 2.0	A 6.6
M-83 & Tuscola St.		C 23.8			C 25.2		B 12.6	A 5.2		B 15.0	A 7.7		A 8.7
M-83 & Weiss St.*				B 14.8		A 5.6		A 0.7	A 0.2	A 3.9	A 1.6		A 2.5
Total Delay	465.1 (7.75 minutes)												
Signalized Intersection	Weekend PM Peak Hour LOS/Delay (s/veh) Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	F 362.1	F 88.4		F 105.5	F 142.2		C 20.6	B 11.2	B 14.2	D 43.4	A 6.2	A 4.6	E 57.7
M-83 & Covered Bridge Ln	C 32.5	C 25.1		D 37.0	C 27.6		C 24.6	A 9.8	C 22.7	F 180.9	B 15.9	B 14.5	C 28.5
M-83 & Pedestrian Crossing								A 9.1			C 21.9		B 15.9
M-83 & Rosstal St. / Cass St.		C 25.4			B 16.1		C 27.0	B 14.1			A 7.1	A 5.8	A 7.8
M-83 & Tuscola St.		C 26.8			C 33.0		B 14.8	A 6.1		B 13.8	A 8.4		A 10.3
M-83 & Weiss St.*				F 426.9		F 57.2		A 3.8	A 3.3	E 36.9	D 29.5		E 35.2
Total Delay	1,214.4 (20.24 minutes)												

*Unsignalized

Future (Year 2045) Three-Lane Scenario

Under this alternative, M-83 would be reduced from two travel lanes in each direction to one lane in each direction with a continuous two-way left-turn lane (TWLTL) and on-street bike lanes (i.e., Road Diet) from just south of Christmas Lane to Tuscola Street. Additionally, all signalized intersections would be retimed. On-street parking was not considered to be a viable option due the impacts to traffic operations resulting from on-street parking delays.

With the future traffic and the three-lane roadway configurations, all study area intersections operate at acceptable levels of service in the weekday PM peak hour. The eastbound left turn at Jefferson Street would operate at LOS D. Some moderate queuing (200-225 feet) would occur southbound and northbound at Jefferson Street, northbound at Covered Bridge Lane, southbound at the pedestrian crossing, and southbound at Tuscola Street.

During the weekend PM peak hour, significant delays and queues would arise under the three-lane roadway scenario as follows:

1. Overall Jefferson Street is predicted to operate at LOS F
    a. All approaches at the intersection of Jefferson Street are predicted to operate at LOS F
2. Overall Covered Bridge Lane is predicted to operate at LOS F
    a. The westbound left turn, northbound approach, and southbound left turn is predicted to operate at LOS F
3. The southbound approach at the pedestrian crossing is predicted to operate at LOS E
4. Overall Cass Street is predicted to operate at LOS E
    a. The southbound approach is predicted to operate at LOS F
    b. Queuing of southbound traffic at Cass Street will extend through the Tuscola Street intersection and result in failing LOS at Tuscola Street
5. Overall Tuscola Street is predicted to operate at LOS F
    a. All approaches are predicted to operate at LOS F
6. The westbound approach from Weiss is predicted to operate at LOS F

Significant queuing (450+ feet) would occur on all the Jefferson Street approaches with the northbound through movement predicted to queue back 2,460 feet. Additional significant queuing is predicted as follows:

- Northbound at Covered Bridge Lane – 880 feet
- Southbound at pedestrian crossing – 380 feet
- Southbound at Cass Street – 560 feet
- Eastbound at Tuscola Street – 350 feet
- Westbound at Tuscola Street – 375 feet
- Southbound Through-Left lane – 860 feet
- Southbound Through-Right lane – 810 feet

Table 5 depicts LOS by movement for each intersection. The SimTraffic results for this scenario are included in Appendix D.

Table 5 – Three-Lane (2045) Delay and Level of Service

	Weekday PM Peak Hour LOS/Delay (s/veh) Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	D 41.9	B 18.0		C 22.7	C 23.0		C 27.5	B 12.4	B 10.7	C 24.2	B 10.3	A 7.7	B 15.0
M-83 & Covered Bridge Ln	B 18.9	C 22.0		C 20.6	B 17.3		C 25.7	B 10.1	A 8.2	C 22.5	A 5.2	A 3.2	A 9.2
M-83 & Pedestrian Crossing								A 9.0			B 11.3		B 10.2
M-83 & Rosstal St. / Cass St.		C 24.6			C 20.4		B 11.2	A 4.7			A 5.0	A 3.2	A 5.5
M-83 & Tuscola St.		C 24.4			C 26.8		B 12.4	A 3.8		B 16.3	A 9.3		A 9.0
M-83 & Weiss St.*				C 15.7		A 5.0		A 0.7	A 0.3	A 4.4	A 1.5		A 2.5
Total Delay	490.9 (8.18 minutes)												
Signalized Intersection	**Weekend PM Peak Hour LOS/Delay (s/veh) Movement**												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Overall
M-83 & Jefferson St.	F 683.1	F 157.4		F 83.7	F 105.9		F 333.6	F 329.6	F 335.8	F 212.2	F 81.6	F 81.6	F 210.9
M-83 & Covered Bridge Ln	B 31.3	B 25.1		E 65.0	B 23.2		F 156.7	F 167.3	F 169.0	F 256.8	D 48.6	D 42.2	F 113.5
M-83 & Pedestrian Crossing								B 13.2			E 75.3		D 44.0
M-83 & Rosstal St. / Cass St.		D 43.5			A 9.5		D 47.6	B 15.1			E 91.7	E 88.0	E 59.4
M-83 & Tuscola St.		F 291.8			F 401.3		F 93.4	A 8.4		C 27.0	F 133.0		F 111.1
M-83 & Weiss St.*				F 251.2		F 125.6		D 28.8	C 17.0	D 29.3	A 3.4		E 42.0
Total Delay	2,255.8 (37.60 minutes)												

*Unsignalized

4.0 RECOMMENDED IMPROVEMENTS

Table 6 and Figures 2 and 3 summarize the recommended improvements for M-83 from Weiss Street to Tuscola Street. The goal of these improvements is to help make the street more walkable, with a particular focus on safety for both vehicles and non-motorized travel, e.g. to make M-83 a more "complete street". The recommendations are based on input from MDOT, previous work by the City, the project Stakeholder Committee, and the analysis provided in this report. It is intended that the City will use this list as a source for identifying potential projects to be added to the Capital Improvement Plan (CIP). Some improvements, particularly changes in access design, may be made as part of future developments or redevelopments. It will be important in the future to measure progress, reassess priorities, and strive to further increase safety along M-83. The recommended improvements are based upon the ease and feasibility of implementation and are not required to be completed in any particular order.

Level I
Level I projects are considered high priority projects they could be implemented immediately as they are lower in cost, easiest to implement, do not result in environmental, aesthetic or social impacts, have minimal public opposition, and provide immediate benefits. These projects can help create early success, building momentum for other Level II and III improvements to help implement a complete street along M-83.

Level II
Level II projects may include minor acquisition of right-of-way, short-term disruption, and/or new construction. These projects may also require agreements between business owners or require additional funding sources. These projects could be implemented when funding becomes available or agreements are finalized.

Level III
Level III projects include more complex facility improvements, acquisition of right-of-way, and may require additional time for planning, designing, identifying and securing funding, and construction. These projects tend to have greater right-of-way, environmental, aesthetic, and social impacts. These projects are typically incorporated with other long-term transportation projects. These projects could be constructed at any time as funding is secured and required studies are completed.

4.1 Access Management

Access management improves overall traffic safety and can help prevent vehicular crashes. Proper access management results in shorter travel times and reduced motorist costs. In the context of a downtown, good access management reduces potential traffic conflicts, consequently improving pedestrian and bicycle safety. Enhanced access to properties can also increase the value of private land development and overall general appearance of properties. Where possible, driveways should be aligned with those across the street or offset a sufficient distance to reduce left-turning movement conflicts.

One of the goals along the corridor is to bring the access/driveway spacing into better conformance with the MDOT access spacing guidelines. The strategy is to gradually remove or relocate the access points/driveways that are the least conforming. This can be accomplished in a number of ways:

1. Voluntary closure by the property owner
2. Closure as part of an MDOT project
    - Business owners could permit access improvements as part of MDOT project cost, thus avoid paying for the change that may be required later by the City or MDOT
3. Access improvement as part of site plan approval for new development, a change in use, or a review of access and input from MDOT as part of the site plan or use approval process. Expansion that increases traffic for this to occur, the City should require
4. For this to occur, the city should require as part of MDOT access permit review and approval. MDOT can assert its right to review access and require improvements for reoccupancy or redevelopment to a more intense use in terms of traffic generated.
    - City should notify MDOT of any new development or changes proposed on a commercial site that may increase the amount of traffic or change traffic patterns at the access point
5. MDOT could require closure or change in driveway design to improve safety. For example, driveways too close to pedestrian crosswalks or in proximity to locations with crash issues

A special provision for the M-83 corridor in the City's zoning ordinance is recommended to formalize the collaboration process between the City of Frankenmuth and MDOT regarding any proposed development requiring a MDOT permit for a change in access. This will also help alert applicants about MDOT's role in access permit review and approval.

4.2 Service Drives and Parking Lot Cross Access

As with access management, service drives and parking lot cross access improves overall traffic safety and can help prevent vehicular crashes. Per the MDOT Access Management Guidelines, frontage roads, service drives, and rear access drives can eliminate the need for multiple driveways, offer safe and efficient access between parcels, and provide parking and access to more than one property. Frontage and rear access drives could reduce the number of conflict points and preserve the capacity on M-83. Access to property from a local street, alley, or service drive is safer due to lower speeds and traffic volume while still providing reasonable access to all businesses. Encouraging shared access agreements between businesses can reduce the number of driveways on M-83 further reducing the need for drivers to use M-83 to access adjacent businesses.

In order to implement potential service drives, parking lot cross access, and access management measures, a Cross Access/Common Driveway/Cross Parking agreement between adjacent property owners should be formalized. The agreement should:

- Grant and convey perpetual, non-exclusive, mutual cross access easements for purposes of vehicular and pedestrian ingress and egress on, over, upon, and across the designated easement areas between adjacent land owners.
- Grant and convey perpetual, non-exclusive, mutual common driveway easements for purposes of vehicular ingress and egress on, over, upon, and across the designated easement areas between adjacent land owners.
- Grant and convey perpetual, non-exclusive, mutual cross parking easements for use of all parking spaces within the designated easement areas between adjacent land owners.

Table 6 – Recommended Improvements

Recommended Improvement	Notes
Level I	
Enhanced Pedestrian Signing	Install high-visibility pedestrian crossing signs in advance of all intersections.
Add Midblock Pedestrian Crossing South of Tuscola Street[1]	Install new mid-block crossing – High-visibility pedestrian sign w/Rectangular Rapid Flashing Beacons (RRFB) or pedestrian signal/hybrid beacon, in-street pedestrian crossing sign, stamped concrete/pavers, zebra-style pavement markings, lighting. While this location has merit for a mid-block pedestrian crossing, there are nearby driveways that have less than preferred spacing from the potential crossing location. Removal/closure of those driveways, to reduce conflicts between pedestrian/bicyclists and vehicles, is recommended prior to installation of the mid-block crossing.
Enhance Midblock Pedestrian Crossing & Crossing at Flint Street	Enhance existing crossings – High-visibility pedestrian sign w/RRFB, in-street pedestrian crossing sign, zebra-style pavement markings, lighting.
Shared Bike Lanes / Sharrows	Install shared bike lanes/sharrows on outside lanes with pavement markings and signing from Jefferson Street to Tuscola Street to connect existing bike routes.
Road Diet – *Weiss Street to Jefferson Street*	Restripe M-83 as a three-lane roadway with on-street bike lanes from Weiss Street to just south of Jefferson Street.
Multi-Use Paths	Develop prioritized list of multi-use paths.
Level II	
Multi-Use Paths	Construct ten-foot wide multi-use path(s) based on prioritized list of paths
Construction of Non-Motorized Bridge Over Cass River	Construct non-motorized, multi-use bridge over Cass River connecting (future) non-motorized path along west side of river to Heritage Park.
Ten-foot multi-use path – *West side of Cass River from Tuscola to Cass River Pedestrian Bridge*	Construct ten-foot wide multi-use path along west side of Cass River from Jefferson Street to Tuscola Street
Ten-foot multi-use path – *West side of M-83 from Weiss to Jefferson*	Construct ten-foot wide multi-use path along west side of M-83 from Weiss Street to Jefferson Street
Service Drive / Connected Parking Lots	Develop service drive between Fairfield Inn and Spring Hill Suites parking lots and beyond. Establish clear wayfinding signage, curbs, and striping to direct vehicular traffic through service drive and parking lots.
	Better define rear service drive/connected parking lots behind Zehnder's. Establish clear wayfinding signage, curbs, and striping to direct vehicular traffic through rear service drive and parking lots between the businesses from Gunzenhausen Street to Cass Street.
	Better define rear service drive/connected parking lots behind businesses from Covered Bridge Lane to the Honey B's parking lot. Establish clear wayfinding signage, curbs, and striping to direct vehicular traffic through rear service drive and parking lots.

Level II	
Access management[2]	Cap and share redundant driveways where possible. Remove driveways where practical. Priority is to eliminate driveways nearest the pedestrian crosswalks, those closest to signaled intersections, and those that are poorly offset (spaced) from driveways on the opposite side of the street (see figure 3). Sharing of driveways, and potentially parking is desired, where possible. Primary access should be to local side street instead of along M-83.[3]
M-83/Weiss Street Intersection	Construct roundabout at intersection.
M-83/Jefferson Street Intersection	Widen Jefferson Street at M-83 to provide westbound right turn lane.
M-83/Jefferson Street Intersection	Modify traffic signal to provide for protected-permitted phasing for the southbound left turn and eastbound left turn as well as an overlap phase for the westbound right turn during the protected southbound left turn phase.
M-83/Covered Bridge Lane Intersection	Modify traffic signal to provide for protected-permitted phasing of northbound and southbound left turns.
Service Drive	Construct service drive from Jefferson Street to Flint Street.

1. See Figure 2 for mid-block crossing and access management locations
2. See Figure 3 for shared driveway/closure
3. The National Association of City Transportation Officials (NATCO)

FIGURE 1

M-83 CORRIDOR STUDY: EXISTING CONDITIONS

MOTORIZED CONFLICTS:

The crash analysis from 2013-2017 showed a total of 159 crashes within the study area over the five-year period. Of these crashes, there were 0 fatalities, 8-injury crashes, 20 possible injury crashes, 3 crashes involving pedestrians, 0 crashes involving bicyclists, and 131 property damage only (PDO) crashes. 6 crashes were alcohol/drug related.

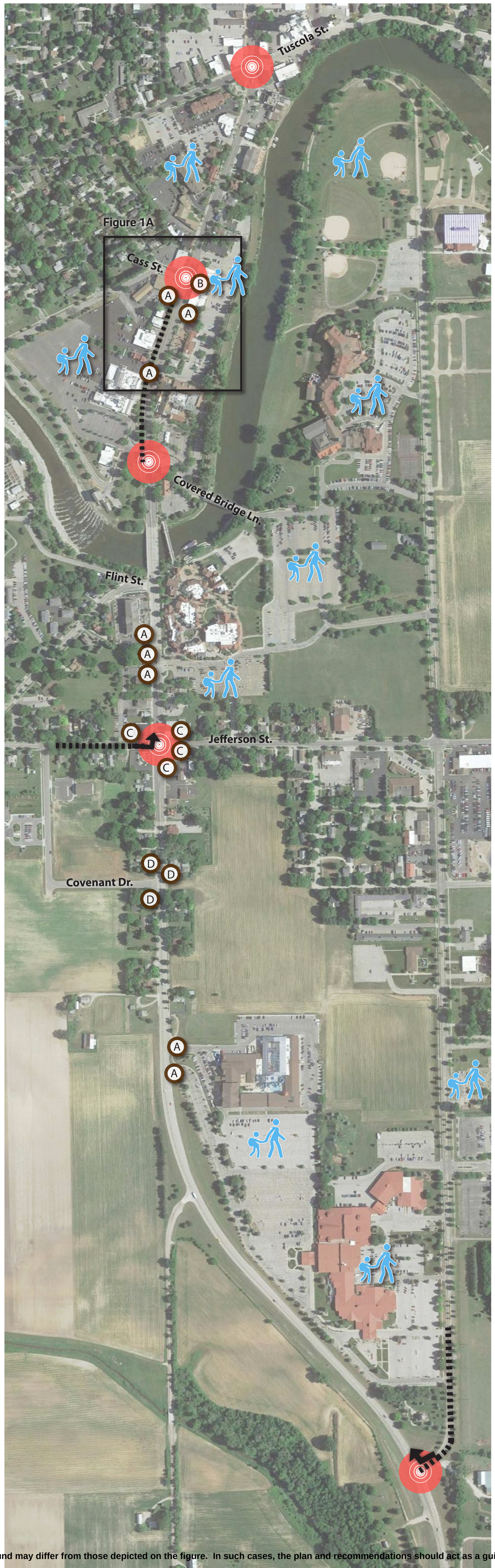
Crashes Along the Corridor

The majority of segment crashes (non-intersection) are typically **associated with one of the many curb cuts/driveways** along M-83. These crash types and locations are typical of a commercial corridor with signalized intersections and numerous driveways.

Recommended Minimum Spacing Between Driveways:

Speed on Roadway (MPH)	MDOT Spacing Guidelines (feet)
25	130
30	185
35	245
40	300
45	350
50	455
55	455+

MDOT Access Management Guidebook, 2001



RIGHT OF WAY CONSTRAINTS:

Weiss Street to the Christmas Lane, M-83 ranges from 24 to 58 feet. No sidewalks are within the this stretch of M-83. Development along this stretch is limited with ample right-of-way.

Typical view from Weiss St. to Christmas Lane

North of Christmas Lane the land use transitions to residential and the roadway narrows to 48 feet with a four-foot green strip and five-foot sidewalk.

North of Christmas Lane typical road

From Jefferson St. to Tuscola St., the roadway is 44 feet wide with a two-foot green strip and five to ten-foot sidewalk abutting parking lots and buildings. Throughout this segment, there is limited right-of-way for roadway or non-motorized improvements. Any significant widening would require the removal of buildings, parking lots, retaining walls, landscaping, etc.

View of typical right-of-way Tuscola St. to Jefferson St.

DRIVEWAY CONFLICTS

- (A) Driveway less than minumum recommended distance from other driveways
- (B) Drive with insufficient offset from facing road
- (C) Driveway less than 230’ from signalized intersection
- (D) Driveway less than 115’ from unsignalized intersection

LEGEND:

- Movements at LOS E or worse (55 seconds of delay or worse, weekend traffic only)
- Intersection queues longer tha 200 ft.
- Higher Crash Area
- High Traffic/ Pedestrian Generator

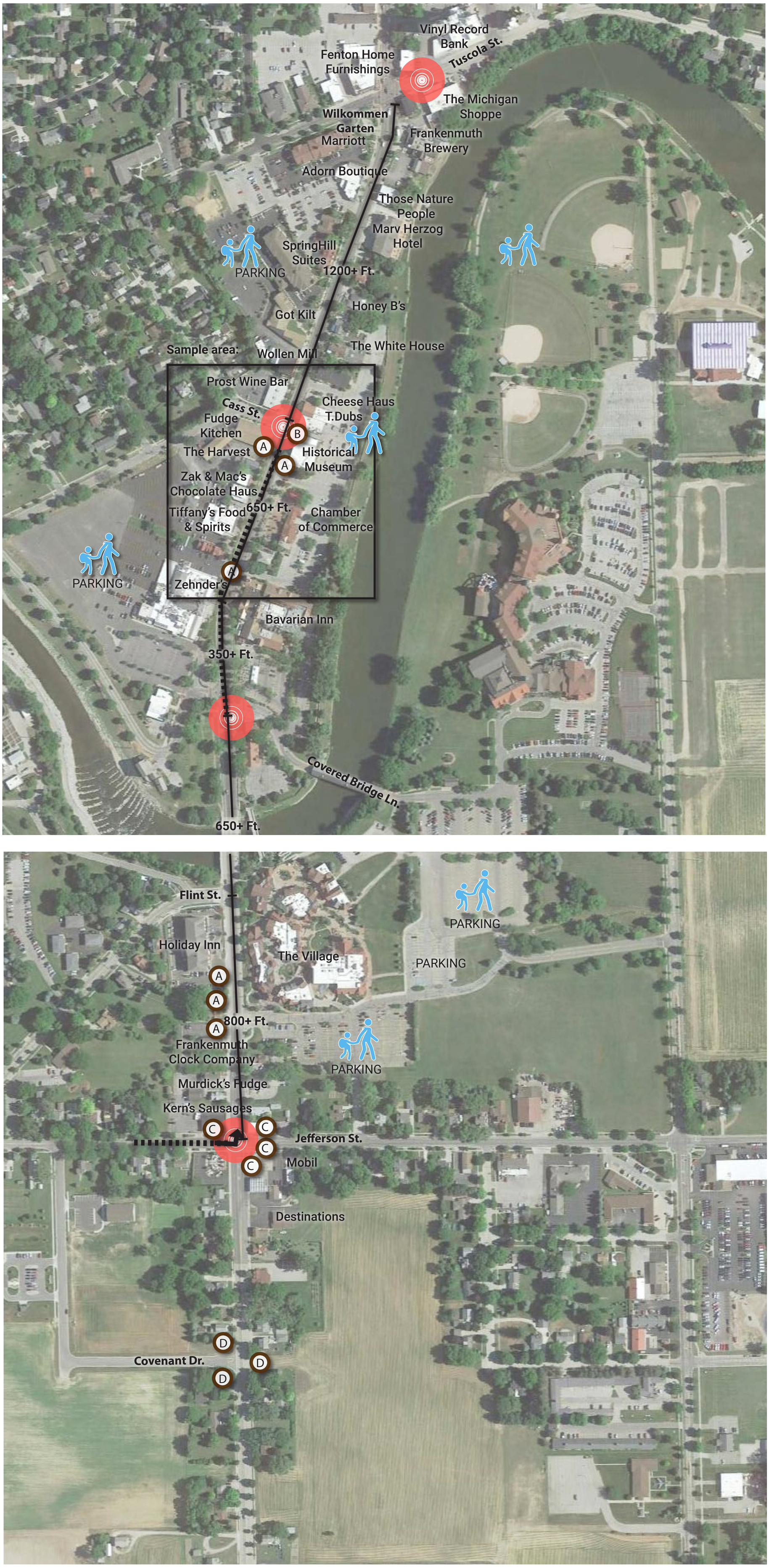
0’ 500’ 1000’

M-83 CORRIDOR STUDY

DLZ MKSK

Actual conditions on the ground may differ from those depicted on the figure. In such cases, the plan and recommendations should act as a guide in terms of best practices.

FIGURE 1A



DRIVEWAY CONFLICTS

- A — Driveway less than minumum recommended distance from other driveways
- B — Drive with insufficient offset from facing road
- C — Driveway less than 230' from signalized intersection
- D — Driveway less than 115' from unsignalized intersection

LEGEND:

- Movements at LOS E or worse (55 seconds of delay or worse, weekend traffic only)
- Intersection queues longer tha 200 ft.
- Higher Crash Area
- High Traffic/ Pedestrian Generator

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FIGURE 2

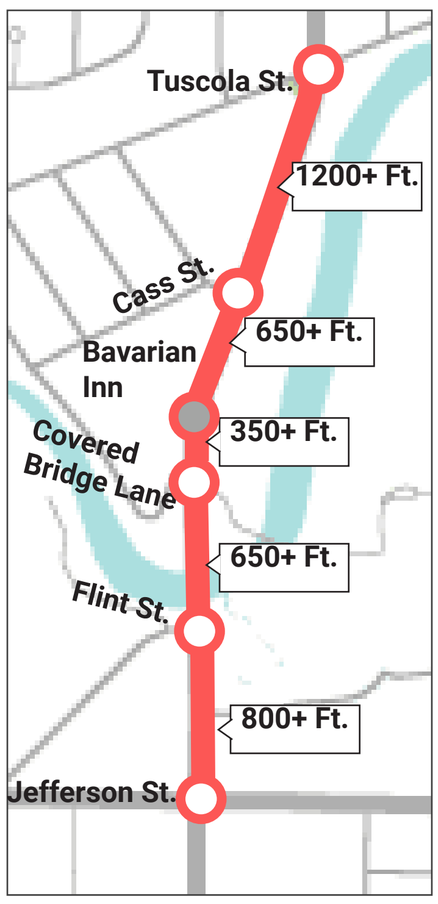
M-83 CORRIDOR STUDY: EXISTING CONDITIONS

PEDESTRIAN CONFLICTS:

The majority of conflicts with M-83 and other road-users occur at the project area intersections. The most significant pedestrian volumes occur at Covered Bridge Lane, the Zehnders-Bavarian Inn Pedestrian Crossing, and at Cass Street. The high pedestrian volumes at these locations are associated with **weekend festivals** and the large traffic generators located along this section of M-83. As noted in the crash summary there were three pedestrian/vehicle crash over the five-year study period. There is no discernable vehicle/pedestrian crash patterned based on the number of crashes and locations.

Long blocks give little opportunity for pedestrians to cross

Multiple driveways with pedestrian-vehicle conflicts



Distances between existing signalized pedestrian crossings North of Jefferson St.

NON-MOTORIZED FACILITIES:

The public right-of-way has little to no bicycle facilities (lanes, bicycle parking, etc.) on M-83. As noted above, the right-of-way does have space constraints that make some bicycle facilities difficult to implement.

Pedestrian bridge over Cass River

The corridor also has a non-motorized pedestrian bridge over the Cass Riveras well as the Gunzenhausen Street Walkway along the northern bank.

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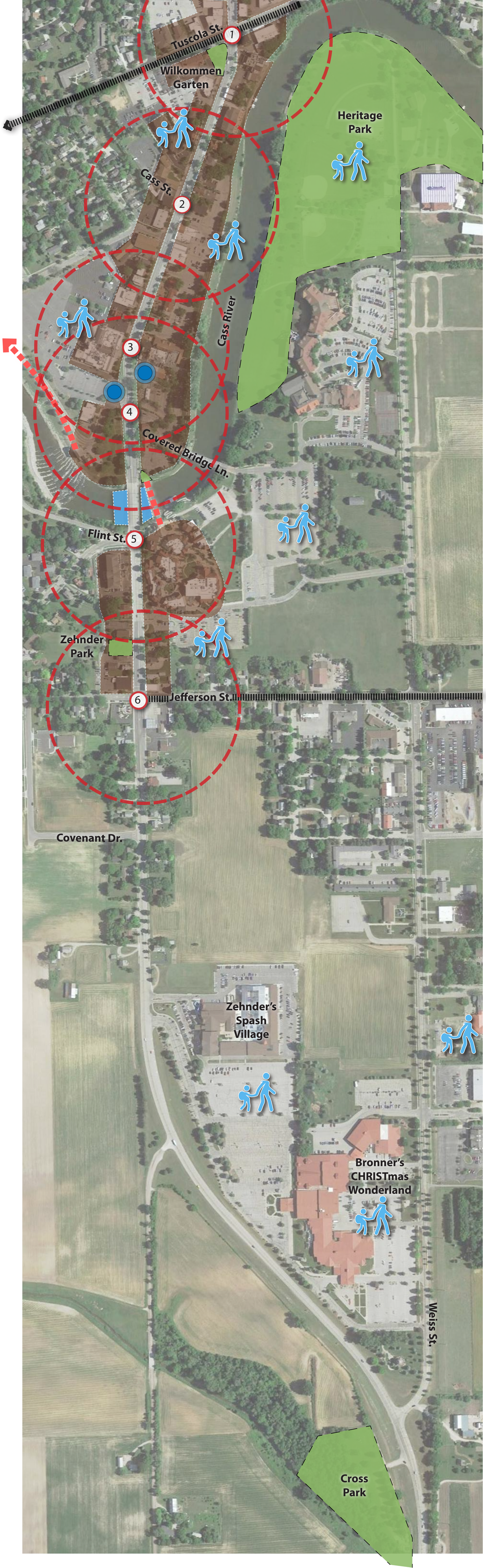


VISUAL INVENTORY OF EXISTING INTERSECTIONS:

1 Tuscola St. intersection with traffic signal

2 Cass St 3-way intersection with traffic signal

3 Bavarian Inn signalized mid-block crossing

4 Covered Bridge Lane intersection with traffic signal

5 Existing mid-block crossing at Flint St.

6 Jefferson St. intersection with traffic signal

LEGEND:

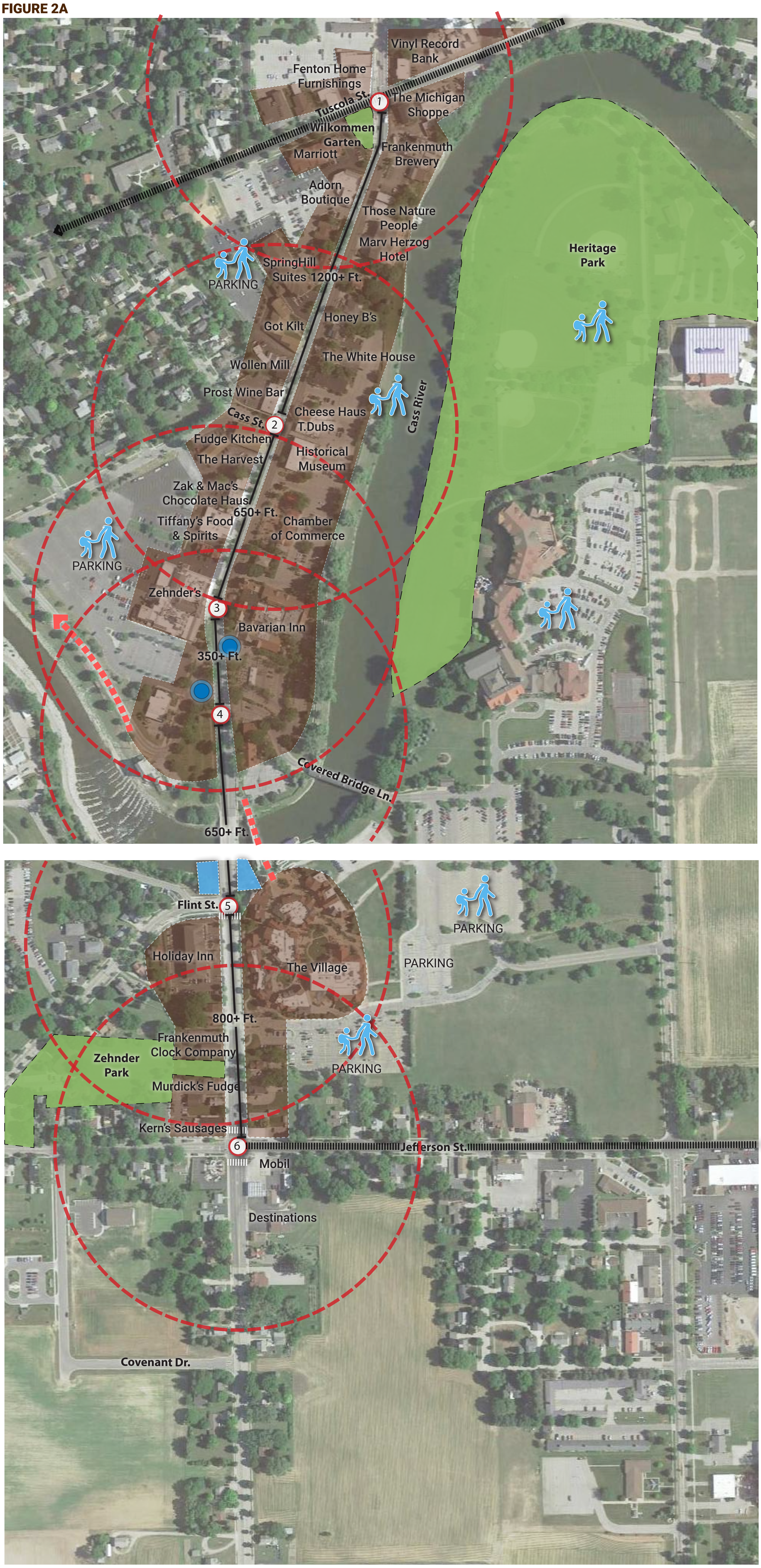
- Historic District
- Park/ Recreational
- Cass River
- Historic Site
- Existing Bike/ Shared Lane
- Existing Non-Motorized Multi-Use Path
- # Existing Crossing
- High Traffic / Pedestrian Generator
- Average walking distance pedestrian willing to travel and wait to cross*

*The National Association of City Transportation Officials (NACTO)

0' 500' 1000'

M-83 CORRIDOR STUDY
June 28, 2018

FIGURE 2A



LEGEND:

- Historic District
- Park/ Recreational
- Cass River
- Historic Site
- Existing Bike/ Shared Lane
- Existing Non-Motorized Multi-Use Path
- # Existing Crossing
- High Traffic / Pedestrian Generator
- Average walking distance pedestrian willing to travel and wait to cross*

*The National Association of City Transportation Officials (NACTO)

DLZ MKSK

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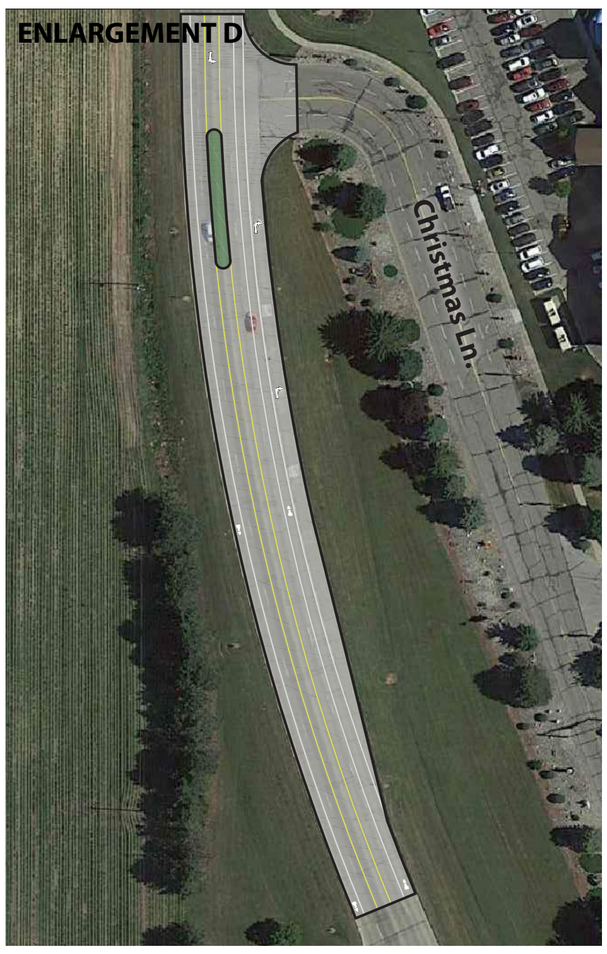
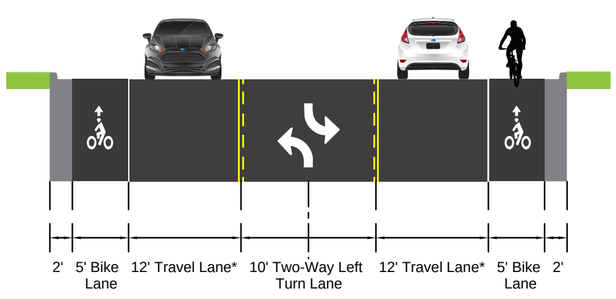
FIGURE 3

M-83 CORRIDOR STUDY: RECOMMENDED IMPROVEMENTS



Three-lane road diet layout south of Jefferson Street to Covenant Drive (top left) and Christmas Lane to Weiss Street (above).

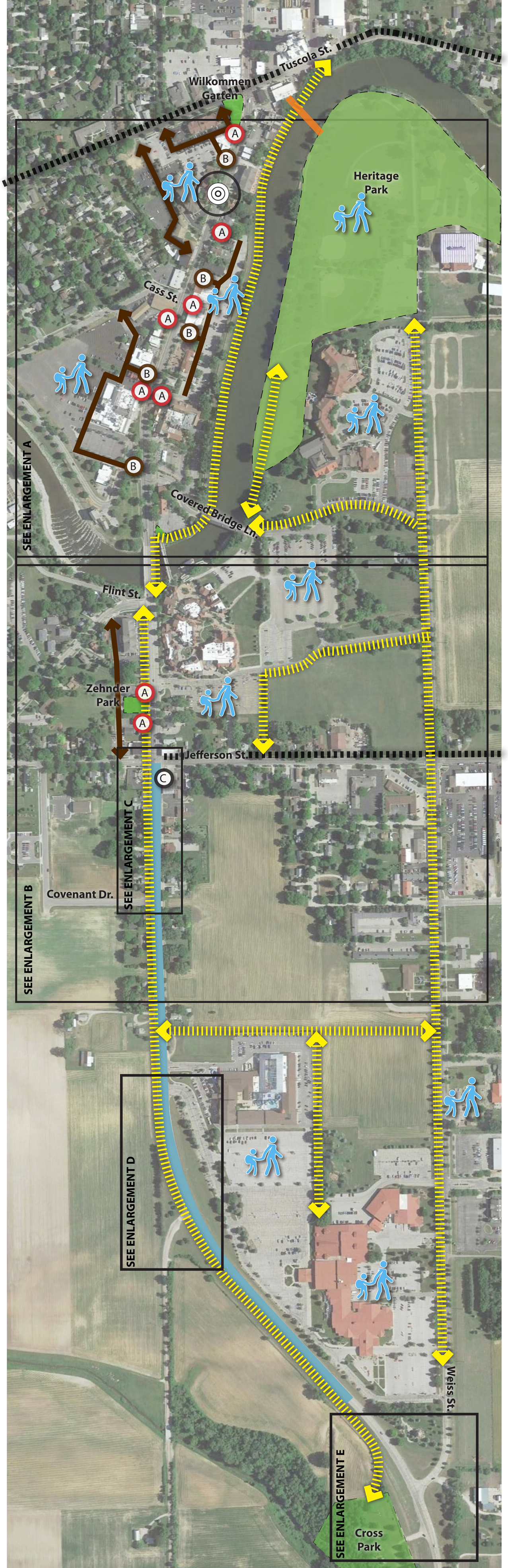


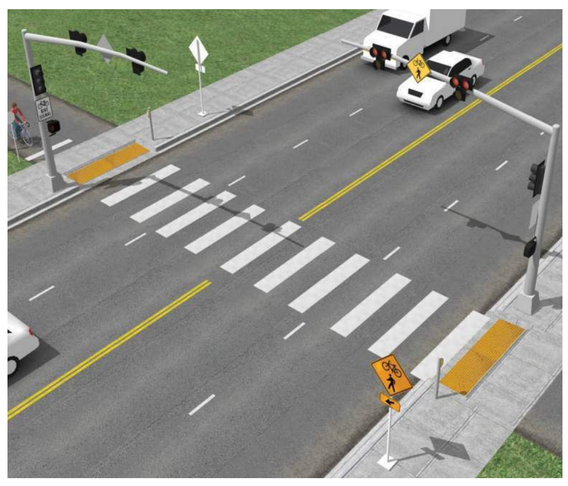
Three-lane cross section of M-83 road diet south of Jefferson Street to Weiss Street

*Per the MDOT Truck Operator Map, M-83 is a designated "Gold Truck Route." Therefore, 12-foot minimum travel lanes are required.

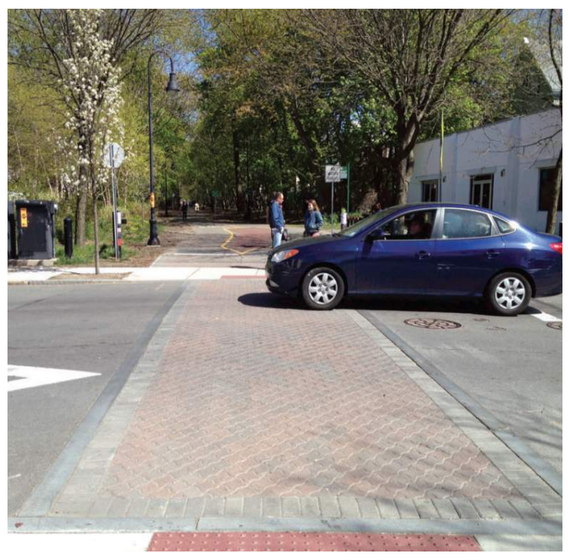
ENLARGEMENT E

Recommended roundabout layout at Weiss Street



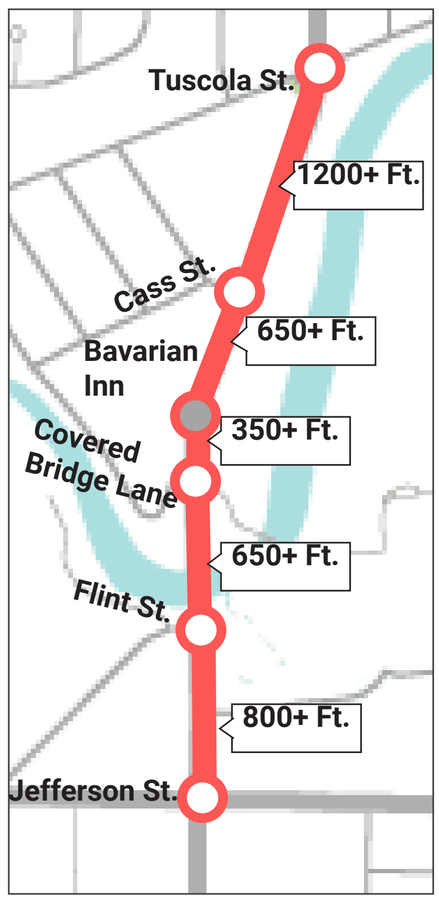


Mid-block crossing hybrid beacon type recommended for location



Recommended paving type change at midblock crossing

EXISTING DISTANCES BETWEEN CROSSWALKS



ACCESS MANAGEMENT RECOMMENDATIONS:

- (A) Driveway to be eliminated; parking to be accessed via rear service road
- (B) Driveway to accommodate traffic for rear service road
- Define rear service road
- (C) Redundant driveway to be eliminated

See Enlargements A and B for detailed recommendations.

LEGEND:

- High traffic/pedestrian generator
- Existing bike lanes
- Non-motorized multi-use path
- Extents of road diet south of Jefferson Street
- Implementation of mid-block crossing with flashing beacon, RFB, HAWK
- Pedestrian bridge

0' 500' 1000'

M-83 CORRIDOR STUDY

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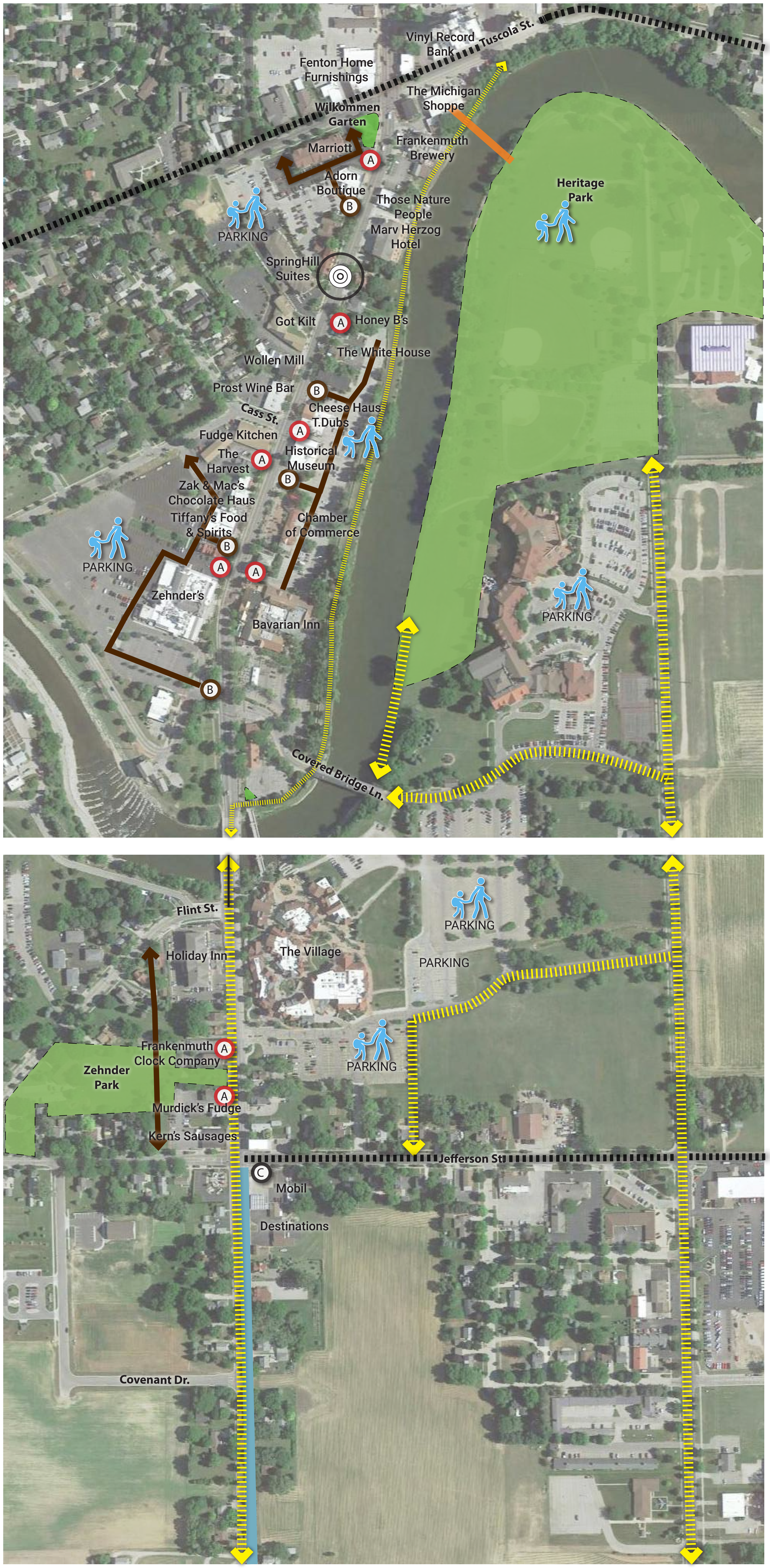
Actual conditions on the ground may differ from those depicted on the figure. In such cases, the plan and recommendations should act as a guide in terms of best practices.

FIGURE 3A



ACCESS MANAGEMENT:

Access management involves reducing the number of access points and making sure they are well placed to improve safety and traffic flow along the corridor.

CURRENT DRIVEWAY SPACING:

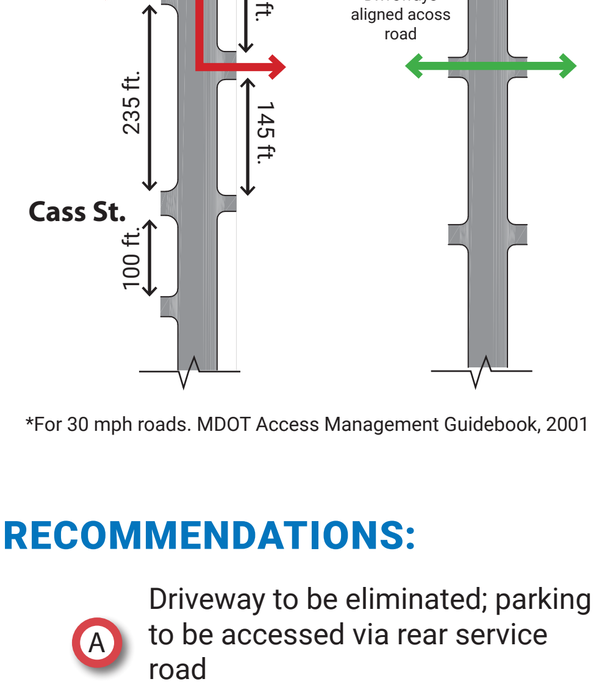
-15 driveways in 1500 ft.

-Only 4 aligned driveways

RECOMMENDED MDOT DRIVEWAY SPACING*:

-12 driveways in 1500 ft.

-Driveways aligned across road



*For 30 mph roads. MDOT Access Management Guidebook, 2001

RECOMMENDATIONS:

- (A) Driveway to be eliminated; parking to be accessed via rear service road
- (B) Driveway to accommodate traffic for rear service road
- Defined rear service road
- (C) Redundant driveway to be eliminated

LEGEND:

- High traffic/pedestrian generator
- Existing bike lanes
- Non-motorized multi-use path
- Extents of road diet south of Jefferson Street
- Implementation of mid-block crossing with flashing beacon, RFB, HAWK
- Pedestrian bridge

DLZ MKSK

Actual conditions on the ground may differ from those depicted on the figure. In such cases, the plan and recommendations should act as a guide in terms of best practices.

Appendix A - SYNCHRO Results

Existing Conditions - Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	66	24	25	58	115	21	310	20	107	375	65
Future Volume (veh/h)	50	66	24	25	58	115	21	310	20	107	375	65
Number	5	2	12	1	6	16	3	8	18	7	4	14
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
Adj Sat Flow, veh/h/ln	1792	1792	1900	1827	1827	1900	1792	1792	1900	1845	1845	1900
Adj Flow Rate, veh/h	62	81	30	32	75	149	24	352	23	120	421	73
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.77	0.77	0.77	0.88	0.88	0.88	0.89	0.89	0.89
Percent Heavy Veh, %	6	6	6	4	4	4	6	6	6	3	3	3
Cap, veh/h	275	338	125	378	148	294	550	1822	119	607	1678	289
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	0.75	0.75	0.75
Sat Flow, veh/h	1106	1247	462	1248	546	1084	864	3246	211	992	2989	515
Grp Volume(v), veh/h	62	0	111	32	0	224	24	184	191	120	246	248
Grp Sat Flow(s),veh/h/ln	1106	0	1709	1248	0	1630	864	1703	1754	992	1752	1751
Q Serve(g_s), s	3.5	0.0	3.5	1.4	0.0	8.1	1.0	3.7	3.8	3.3	3.1	3.1
Cycle Q Clear(g_c), s	11.6	0.0	3.5	5.0	0.0	8.1	4.1	3.7	3.8	7.0	3.1	3.1
Prop In Lane	1.00		0.27	1.00		0.67	1.00		0.12	1.00		0.29
Lane Grp Cap(c), veh/h	275	0	464	378	0	442	550	956	985	607	984	983
V/C Ratio(X)	0.23	0.00	0.24	0.08	0.00	0.51	0.04	0.19	0.19	0.20	0.25	0.25
Avail Cap(c_a), veh/h	275	0	464	378	0	442	550	956	985	607	984	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	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	26.5	0.0	19.9	21.8	0.0	21.5	8.4	7.5	7.6	5.5	4.3	4.3
Incr Delay (d2), s/veh	1.9	0.0	1.2	0.4	0.0	4.1	0.1	0.4	0.4	0.7	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(95%),veh/ln	2.2	0.0	3.3	1.0	0.0	7.4	0.4	3.3	3.5	1.8	2.9	2.9
LnGrp Delay(d),s/veh	28.4	0.0	21.1	22.2	0.0	25.6	8.5	8.0	8.0	6.2	4.9	4.9
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		173			256			399			614	
Approach Delay, s/veh		23.7			25.2			8.0			5.2	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		45.0		25.0		45.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		19.0		* 39		19.0		* 39
Max Q Clear Time (g_c+I1), s		13.6		9.0		10.1		6.1
Green Ext Time (p_c), s		0.3		3.9		1.0		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	4	90	25	8	35	54	421	31	33	457	11
Future Volume (veh/h)	10	4	90	25	8	35	54	421	31	33	457	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	0.97		0.90	0.96		0.90
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1827	1827	1900	1845	1845	1900
Adj Flow Rate, veh/h	11	5	103	31	10	43	57	448	33	39	544	13
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	3	3	3
Cap, veh/h	470	22	450	421	92	396	465	1733	127	522	1859	44
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.71	0.71	0.71	0.53	0.53	0.53
Sat Flow, veh/h	1329	73	1500	1279	307	1319	810	3252	238	867	3489	83
Grp Volume(v), veh/h	11	0	108	31	0	53	57	238	243	39	273	284
Grp Sat Flow(s),veh/h/ln	1329	0	1573	1279	0	1626	810	1736	1755	867	1752	1819
Q Serve(g_s), s	0.4	0.0	3.6	1.3	0.0	1.7	2.2	3.4	3.5	1.7	6.0	6.1
Cycle Q Clear(g_c), s	2.1	0.0	3.6	4.9	0.0	1.7	8.3	3.4	3.5	5.2	6.0	6.1
Prop In Lane	1.00		0.95	1.00		0.81	1.00		0.14	1.00		0.05
Lane Grp Cap(c), veh/h	470	0	472	421	0	488	465	925	935	522	934	969
V/C Ratio(X)	0.02	0.00	0.23	0.07	0.00	0.11	0.12	0.26	0.26	0.07	0.29	0.29
Avail Cap(c_a), veh/h	470	0	472	421	0	488	465	925	935	522	934	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	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	18.5	0.0	18.4	20.3	0.0	17.7	7.3	5.3	5.3	9.8	9.0	9.1
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.3	0.0	0.4	0.5	0.7	0.7	0.3	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	3.1	0.9	0.0	1.4	1.0	3.1	3.2	0.8	5.6	5.8
LnGrp Delay(d),s/veh	18.6	0.0	19.5	20.6	0.0	18.2	7.9	5.9	5.9	10.1	9.8	9.8
LnGrp LOS	B		B	C		B	A	A	A	B	A	A
Approach Vol, veh/h		119			84			538			596	
Approach Delay, s/veh		19.5			19.1			6.1			9.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		5.6		8.1		6.9		10.3
Green Ext Time (p_c), s		0.5		3.9		0.3		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	1	10	0	1	0	6	473	0	0	490	22
Future Volume (veh/h)	26	1	10	0	1	0	6	473	0	0	490	22
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.87		0.87	1.00		1.00	0.97		1.00	1.00		0.87
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1900	1810	1900	1900	1845	1900
Adj Flow Rate, veh/h	43	2	17	0	2	0	6	498	0	0	563	25
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	289	25	85	0	461	0	58	1974	0	0	1997	88
Arrive On Green	0.24	0.24	0.24	0.00	0.24	0.00	0.59	0.59	0.00	0.00	0.59	0.59
Sat Flow, veh/h	830	102	352	0	1900	0	9	3436	0	0	3485	150
Grp Volume(v), veh/h	62	0	0	0	2	0	270	234	0	0	290	298
Grp Sat Flow(s),veh/h/ln	1284	0	0	0	1900	0	1798	1564	0	0	1752	1791
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.1	0.0	0.0	5.1	0.0	0.0	5.7	5.7
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.0	0.1	0.0	5.0	5.1	0.0	0.0	5.7	5.7
Prop In Lane	0.69		0.27	0.00		0.00	0.02		0.00	0.00		0.08
Lane Grp Cap(c), veh/h	399	0	0	0	461	0	1111	921	0	0	1031	1054
V/C Ratio(X)	0.16	0.00	0.00	0.00	0.00	0.00	0.24	0.25	0.00	0.00	0.28	0.28
Avail Cap(c_a), veh/h	399	0	0	0	461	0	1111	921	0	0	1031	1054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	0.0	20.1	0.0	7.0	7.0	0.0	0.0	7.1	7.1
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0	0.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	0.0	0.0	0.0	0.1	0.0	4.7	4.2	0.0	0.0	5.3	5.4
LnGrp Delay(d),s/veh	21.7	0.0	0.0	0.0	20.1	0.0	7.5	7.6	0.0	0.0	7.8	7.8
LnGrp LOS	C				C		A	A			A	A
Approach Vol, veh/h		62			2			504			588	
Approach Delay, s/veh		21.7			20.1			7.6			7.8	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		4.4		7.7		2.1		7.1
Green Ext Time (p_c), s		0.2		4.0		0.0		3.3

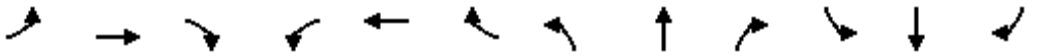
Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	24	22	47	33	13	19	436	35	21	465	26
Future Volume (veh/h)	22	24	22	47	33	13	19	436	35	21	465	26
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	0.99		0.98	0.99		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
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1827	1900	1900	1827	1900	1900	1863	1900
Adj Flow Rate, veh/h	29	31	29	78	55	22	21	479	38	23	511	29
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.77	0.77	0.77	0.60	0.60	0.60	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	4	4	4	4	4	4	2	2	2
Cap, veh/h	158	163	122	228	149	50	95	1836	143	99	1914	107
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	393	715	536	661	654	217	66	3060	238	73	3189	178
Grp Volume(v), veh/h	89	0	0	155	0	0	281	0	257	292	0	271
Grp Sat Flow(s),veh/h/ln	1644	0	0	1532	0	0	1749	0	1615	1781	0	1660
Q Serve(g_s), s	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	5.3	0.0	0.0	5.5
Cycle Q Clear(g_c), s	2.9	0.0	0.0	5.7	0.0	0.0	5.1	0.0	5.3	5.2	0.0	5.5
Prop In Lane	0.33		0.33	0.50		0.14	0.07		0.15	0.08		0.11
Lane Grp Cap(c), veh/h	444	0	0	427	0	0	1105	0	969	1124	0	996
V/C Ratio(X)	0.20	0.00	0.00	0.36	0.00	0.00	0.25	0.00	0.27	0.26	0.00	0.27
Avail Cap(c_a), veh/h	444	0	0	427	0	0	1105	0	969	1124	0	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.9	0.0	0.0	22.9	0.0	0.0	6.6	0.0	6.7	6.6	0.0	6.7
Incr Delay (d2), s/veh	1.0	0.0	0.0	2.4	0.0	0.0	0.6	0.0	0.7	0.6	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(95%),veh/ln	2.7	0.0	0.0	5.1	0.0	0.0	4.8	0.0	4.6	5.1	0.0	4.8
LnGrp Delay(d),s/veh	22.9	0.0	0.0	25.3	0.0	0.0	7.2	0.0	7.3	7.2	0.0	7.4
LnGrp LOS	C			C			A		A	A		A
Approach Vol, veh/h		89			155			538			563	
Approach Delay, s/veh		22.9			25.3			7.2			7.3	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		4.9		7.5		7.7		7.3
Green Ext Time (p_c), s		0.3		3.9		0.5		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	466	0	0	501	0
Future Volume (vph)	0	0	0	0	0	0	0	466	0	0	501	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	3539	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	3539	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		191			245			314			371	
Travel Time (s)		4.3			5.6			7.1			8.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	0	507	0	0	545	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	507	0	0	545	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases								4			8	
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								None			None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								12.5			12.5	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio								0.28			0.28	
v/c Ratio								0.51			0.55	
Control Delay								15.3			15.8	
Queue Delay								0.0			0.0	
Total Delay								15.3			15.8	
LOS								B			B	
Approach Delay								15.3			15.8	
Approach LOS								B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 44.6			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 18.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)

Lane Group	Ø2
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	8	342	357	48	76	9
Future Vol, veh/h	8	342	357	48	76	9
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	9	398	380	51	89	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	433	0	-	0	798	382
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	416	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1127	-	-	-	355	665
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1125	-	-	-	350	664
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	665	-

Approach	SE	NW	SW
HCM Control Delay, s	0.2	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1125	-	350	664
HCM Lane V/C Ratio	-	-	0.008	-	0.255	0.016
HCM Control Delay (s)	-	-	8.2	0	18.8	10.5
HCM Lane LOS	-	-	A	A	C	B
HCM 95th %tile Q(veh)	-	-	0	-	1	0

Existing Conditions - Weekend PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	135	53	61	92	187	59	516	66	116	318	46
Future Volume (veh/h)	82	135	53	61	92	187	59	516	66	116	318	46
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.89	0.94		0.89	0.89		0.81	0.96		0.81
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	86	142	56	68	102	208	62	543	69	130	357	52
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.95	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	1	1	1
Cap, veh/h	199	340	134	303	140	285	600	1758	222	469	1706	243
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	1.00	1.00	1.00
Sat Flow, veh/h	1043	1251	493	1126	516	1052	886	3132	395	781	3039	434
Grp Volume(v), veh/h	86	0	198	68	0	310	62	311	301	130	207	202
Grp Sat Flow(s),veh/h/ln	1043	0	1744	1126	0	1568	886	1805	1722	781	1787	1686
Q Serve(g_s), s	5.7	0.0	6.5	3.7	0.0	12.6	2.3	6.4	6.5	2.7	0.0	0.0
Cycle Q Clear(g_c), s	18.3	0.0	6.5	10.2	0.0	12.6	2.3	6.4	6.5	9.2	0.0	0.0
Prop In Lane	1.00		0.28	1.00		0.67	1.00		0.23	1.00		0.26
Lane Grp Cap(c), veh/h	199	0	473	303	0	425	600	1013	967	469	1003	946
V/C Ratio(X)	0.43	0.00	0.42	0.22	0.00	0.73	0.10	0.31	0.31	0.28	0.21	0.21
Avail Cap(c_a), veh/h	199	0	473	303	0	425	600	1013	967	469	1003	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	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	31.5	0.0	21.0	25.2	0.0	23.2	7.2	8.1	8.2	0.8	0.0	0.0
Incr Delay (d2), s/veh	6.7	0.0	2.7	1.7	0.0	10.5	0.3	0.8	0.8	1.5	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.6	0.0	6.3	2.3	0.0	10.9	1.1	6.0	5.8	1.3	0.2	0.2
LnGrp Delay(d),s/veh	38.2	0.0	23.7	26.9	0.0	33.6	7.6	8.9	9.0	2.2	0.5	0.5
LnGrp LOS	D		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		284			378			674			539	
Approach Delay, s/veh		28.1			32.4			8.8			0.9	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		45.0		25.0		45.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		19.0		* 39		19.0		* 39
Max Q Clear Time (g_c+I1), s		20.3		8.5		14.6		11.2
Green Ext Time (p_c), s		0.0		4.6		1.0		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	4	57	50	27	66	126	444	171	102	402	30
Future Volume (veh/h)	7	4	57	50	27	66	126	444	171	102	402	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.74		0.63	0.73		0.63	0.88		0.63	0.85		0.63
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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	11	6	90	66	36	87	133	467	180	113	447	33
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.63	0.63	0.63	0.76	0.76	0.76	0.95	0.95	0.95	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	1	1	1
Cap, veh/h	310	19	292	322	104	250	475	1162	432	459	1720	125
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	1.00	1.00	1.00	0.53	0.53	0.53
Sat Flow, veh/h	946	65	974	957	345	834	816	2181	811	668	3228	235
Grp Volume(v), veh/h	11	0	96	66	0	123	133	384	263	113	244	236
Grp Sat Flow(s),veh/h/ln	946	0	1039	957	0	1179	816	1805	1187	668	1787	1675
Q Serve(g_s), s	0.6	0.0	5.0	4.0	0.0	5.7	2.4	0.0	0.0	6.7	5.2	5.4
Cycle Q Clear(g_c), s	6.4	0.0	5.0	9.0	0.0	5.7	7.7	0.0	0.0	6.7	5.2	5.4
Prop In Lane	1.00		0.94	1.00		0.71	1.00		0.68	1.00		0.14
Lane Grp Cap(c), veh/h	310	0	312	322	0	354	475	962	632	459	952	893
V/C Ratio(X)	0.04	0.00	0.31	0.21	0.00	0.35	0.28	0.40	0.42	0.25	0.26	0.26
Avail Cap(c_a), veh/h	310	0	312	322	0	354	475	962	632	459	952	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	0.0	18.9	22.4	0.0	19.1	0.6	0.0	0.0	9.2	8.8	8.9
Incr Delay (d2), s/veh	0.2	0.0	2.5	1.4	0.0	2.7	1.5	1.2	2.0	1.3	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.0	2.9	2.1	0.0	3.8	1.3	0.6	0.6	2.5	4.8	4.7
LnGrp Delay(d),s/veh	21.8	0.0	21.4	23.8	0.0	21.8	2.0	1.2	2.0	10.5	9.5	9.6
LnGrp LOS	C		C	C		C	A	A	A	B	A	A
Approach Vol, veh/h		107			189			780			593	
Approach Delay, s/veh		21.5			22.5			1.6			9.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		8.4		8.7		11.0		9.7
Green Ext Time (p_c), s		0.6		4.3		0.8		6.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	14	0	1	2	34	420	5	1	588	59
Future Volume (veh/h)	14	0	14	0	1	2	34	420	5	1	588	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.68		0.68	1.00		0.68	0.97		0.71	0.91		0.71
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1900	1810	1900	1900	1845	1900
Adj Flow Rate, veh/h	23	0	23	0	2	3	36	442	5	1	676	68
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	185	19	127	0	128	192	153	1749	20	52	1777	178
Arrive On Green	0.24	0.00	0.24	0.00	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	444	79	523	0	528	792	159	2971	33	0	3018	302
Grp Volume(v), veh/h	46	0	0	0	0	5	240	0	243	413	0	332
Grp Sat Flow(s),veh/h/ln	1046	0	0	0	0	1320	1539	0	1624	1844	0	1477
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	5.1	0.0	0.0	8.4
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	0.0	0.2	4.4	0.0	5.1	8.3	0.0	8.4
Prop In Lane	0.50		0.50	0.00		0.60	0.15		0.02	0.00		0.20
Lane Grp Cap(c), veh/h	331	0	0	0	0	321	965	0	956	1137	0	869
V/C Ratio(X)	0.14	0.00	0.00	0.00	0.00	0.02	0.25	0.00	0.25	0.36	0.00	0.38
Avail Cap(c_a), veh/h	331	0	0	0	0	321	965	0	956	1137	0	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	0.0	0.0	0.0	20.1	6.8	0.0	7.0	7.6	0.0	7.6
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.6	0.9	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.0	0.0	0.0	0.0	0.1	4.3	0.0	4.3	7.9	0.0	6.5
LnGrp Delay(d),s/veh	21.6	0.0	0.0	0.0	0.0	20.2	7.4	0.0	7.6	8.5	0.0	8.9
LnGrp LOS	C					C	A		A	A		A
Approach Vol, veh/h		46			5			483			745	
Approach Delay, s/veh		21.6			20.2			7.5			8.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		3.9		10.4		2.2		7.1
Green Ext Time (p_c), s		0.2		5.5		0.0		3.4

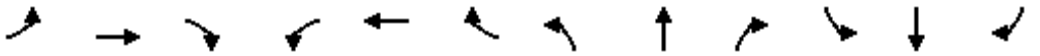
Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	23	35	56	15	26	24	358	58	21	581	17
Future Volume (veh/h)	18	23	35	56	15	26	24	358	58	21	581	17
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.80		0.71	0.78		0.71	0.97		0.84	0.95		0.84
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1900	1900	1900	1900	1900	1881	1900
Adj Flow Rate, veh/h	23	29	44	81	22	38	26	393	64	23	632	18
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.79	0.79	0.79	0.69	0.69	0.69	0.91	0.91	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	110	122	142	225	64	77	120	1656	263	88	2007	56
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	201	533	621	631	279	336	105	2760	438	56	3345	94
Grp Volume(v), veh/h	96	0	0	141	0	0	255	0	228	351	0	322
Grp Sat Flow(s),veh/h/ln	1355	0	0	1247	0	0	1747	0	1557	1820	0	1675
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	4.8	0.0	0.0	6.7
Cycle Q Clear(g_c), s	3.8	0.0	0.0	5.9	0.0	0.0	4.3	0.0	4.8	6.4	0.0	6.7
Prop In Lane	0.24		0.46	0.57		0.27	0.10		0.28	0.07		0.06
Lane Grp Cap(c), veh/h	374	0	0	366	0	0	1105	0	934	1147	0	1005
V/C Ratio(X)	0.26	0.00	0.00	0.39	0.00	0.00	0.23	0.00	0.24	0.31	0.00	0.32
Avail Cap(c_a), veh/h	374	0	0	366	0	0	1105	0	934	1147	0	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.3	0.0	0.0	22.9	0.0	0.0	6.5	0.0	6.6	6.9	0.0	6.9
Incr Delay (d2), s/veh	1.7	0.0	0.0	3.1	0.0	0.0	0.5	0.0	0.6	0.7	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	0.0	0.0	4.7	0.0	0.0	4.4	0.0	3.9	6.4	0.0	5.9
LnGrp Delay(d),s/veh	24.0	0.0	0.0	26.0	0.0	0.0	7.0	0.0	7.2	7.6	0.0	7.8
LnGrp LOS	C			C			A		A	A		A
Approach Vol, veh/h		96			141			483			673	
Approach Delay, s/veh		24.0			26.0			7.1			7.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		5.8		8.7		7.9		6.8
Green Ext Time (p_c), s		0.4		4.7		0.5		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	517	0	0	534	0
Future Volume (vph)	0	0	0	0	0	0	0	517	0	0	534	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	3539	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	3539	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		236			227			338			347	
Travel Time (s)		6.4			6.2			7.7			7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	0	562	0	0	580	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	562	0	0	580	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors								2			2	
Detector Template								Thru			Thru	
Leading Detector (ft)								100			100	
Trailing Detector (ft)								0			0	
Detector 1 Position(ft)								0			0	
Detector 1 Size(ft)								6			6	
Detector 1 Type								Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)								0.0			0.0	
Detector 1 Queue (s)								0.0			0.0	
Detector 1 Delay (s)								0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases												
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								None			None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								13.7			13.7	
Actuated g/C Ratio								0.30			0.30	
v/c Ratio								0.53			0.55	
Control Delay								15.2			15.4	
Queue Delay								0.0			0.0	
Total Delay								15.2			15.4	
LOS								B			B	
Approach Delay								15.2			15.4	
Approach LOS								B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 45.8			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 19.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)

Lane Group	Ø2
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	51
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	44.9

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	82	377	562	350	213	103
Future Vol, veh/h	82	377	562	350	213	103
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	95	438	598	372	251	121

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	970	0	-	0	1227	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	629	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	710	-	-	-	~ 197	502
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	531	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	710	-	-	-	~ 162	502
Mov Cap-2 Maneuver	-	-	-	-	~ 162	-
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	531	-

Approach	SE	NW	SW
HCM Control Delay, s	1.9	0	223.9
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	710	-	162	502
HCM Lane V/C Ratio	-	-	0.134	-	1.547	0.241
HCM Control Delay (s)	-	-	10.9	0	$ 325.2	14.4
HCM Lane LOS	-	-	B	A	F	B
HCM 95th %tile Q(veh)	-	-	0.5	-	16.7	0.9

Notes

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

2045 No Build Conditions - Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	87	32	33	77	152	28	410	26	141	495	86
Future Volume (veh/h)	66	87	32	33	77	152	28	410	26	141	495	86
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	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
Adj Sat Flow, veh/h/ln	1792	1792	1900	1827	1827	1900	1792	1792	1900	1845	1845	1900
Adj Flow Rate, veh/h	81	107	40	43	100	197	32	466	30	158	556	97
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.77	0.77	0.77	0.88	0.88	0.88	0.89	0.89	0.89
Percent Heavy Veh, %	6	6	6	4	4	4	6	6	6	3	3	3
Cap, veh/h	216	337	126	348	149	293	475	1824	117	536	1675	291
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	0.75	0.75	0.75
Sat Flow, veh/h	1035	1243	465	1207	549	1081	746	3248	209	887	2983	519
Grp Volume(v), veh/h	81	0	147	43	0	297	32	244	252	158	326	327
Grp Sat Flow(s),veh/h/ln	1035	0	1707	1207	0	1629	746	1703	1754	887	1752	1749
Q Serve(g_s), s	5.3	0.0	4.8	2.1	0.0	11.4	1.6	5.1	5.2	5.7	4.4	4.4
Cycle Q Clear(g_c), s	16.7	0.0	4.8	6.9	0.0	11.4	6.0	5.1	5.2	10.9	4.4	4.4
Prop In Lane	1.00		0.27	1.00		0.66	1.00		0.12	1.00		0.30
Lane Grp Cap(c), veh/h	216	0	463	348	0	442	475	956	985	536	984	982
V/C Ratio(X)	0.38	0.00	0.32	0.12	0.00	0.67	0.07	0.25	0.26	0.29	0.33	0.33
Avail Cap(c_a), veh/h	216	0	463	348	0	442	475	956	985	536	984	982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	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	30.1	0.0	20.3	23.1	0.0	22.7	9.2	7.9	7.9	6.5	4.4	4.4
Incr Delay (d2), s/veh	4.9	0.0	1.8	0.7	0.0	7.9	0.3	0.6	0.6	1.4	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(95%),veh/ln	3.2	0.0	4.5	1.4	0.0	10.1	0.6	4.6	4.7	2.9	4.0	4.1
LnGrp Delay(d),s/veh	35.1	0.0	22.1	23.8	0.0	30.6	9.5	8.5	8.5	7.9	5.3	5.4
LnGrp LOS	D		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		228			340			528			811	
Approach Delay, s/veh		26.7			29.8			8.6			5.8	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		45.0		25.0		45.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		19.0		* 39		19.0		* 39
Max Q Clear Time (g_c+I1), s		18.7		12.9		13.4		8.0
Green Ext Time (p_c), s		0.0		5.5		1.0		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	5	103	29	9	40	62	484	36	38	525	13
Future Volume (veh/h)	11	5	103	29	9	40	62	484	36	38	525	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	0.98		0.89	0.96		0.89
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1827	1827	1900	1845	1845	1900
Adj Flow Rate, veh/h	13	6	118	36	11	49	66	515	38	45	625	15
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	3	3	3
Cap, veh/h	463	23	448	405	89	397	427	1730	127	488	1858	45
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.71	0.71	0.71	0.53	0.53	0.53
Sat Flow, veh/h	1319	76	1494	1259	297	1325	752	3246	239	812	3486	84
Grp Volume(v), veh/h	13	0	124	36	0	60	66	274	279	45	314	326
Grp Sat Flow(s),veh/h/ln	1319	0	1570	1259	0	1622	752	1736	1749	812	1752	1817
Q Serve(g_s), s	0.5	0.0	4.2	1.6	0.0	1.9	3.0	4.1	4.1	2.2	7.1	7.2
Cycle Q Clear(g_c), s	2.4	0.0	4.2	5.8	0.0	1.9	10.1	4.1	4.1	6.3	7.1	7.2
Prop In Lane	1.00		0.95	1.00		0.82	1.00		0.14	1.00		0.05
Lane Grp Cap(c), veh/h	463	0	471	405	0	487	427	925	932	488	934	968
V/C Ratio(X)	0.03	0.00	0.26	0.09	0.00	0.12	0.15	0.30	0.30	0.09	0.34	0.34
Avail Cap(c_a), veh/h	463	0	471	405	0	487	427	925	932	488	934	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	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	18.7	0.0	18.6	20.8	0.0	17.8	8.0	5.4	5.4	10.3	9.3	9.3
Incr Delay (d2), s/veh	0.1	0.0	1.4	0.4	0.0	0.5	0.8	0.8	0.8	0.4	1.0	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(95%),veh/ln	0.4	0.0	3.6	1.1	0.0	1.6	1.2	3.8	3.8	1.0	6.6	6.8
LnGrp Delay(d),s/veh	18.8	0.0	20.0	21.2	0.0	18.3	8.7	6.2	6.2	10.6	10.3	10.2
LnGrp LOS	B		B	C		B	A	A	A	B	B	B
Approach Vol, veh/h		137			96			619			685	
Approach Delay, s/veh		19.9			19.4			6.5			10.3	
Approach LOS		B			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		6.2		9.2		7.8		12.1
Green Ext Time (p_c), s		0.6		4.6		0.3		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1	11	0	1	0	7	544	0	0	563	25
Future Volume (veh/h)	30	1	11	0	1	0	7	544	0	0	563	25
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.85		0.85	1.00		1.00	0.97		1.00	1.00		0.85
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1900	1810	1900	1900	1845	1900
Adj Flow Rate, veh/h	50	2	18	0	2	0	7	573	0	0	647	29
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	291	22	78	0	461	0	58	1972	0	0	1993	89
Arrive On Green	0.24	0.24	0.24	0.00	0.24	0.00	0.59	0.59	0.00	0.00	0.59	0.59
Sat Flow, veh/h	837	92	322	0	1900	0	9	3432	0	0	3479	152
Grp Volume(v), veh/h	70	0	0	0	2	0	310	270	0	0	334	342
Grp Sat Flow(s),veh/h/ln	1251	0	0	0	1900	0	1795	1564	0	0	1752	1786
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.1	0.0	0.0	6.0	0.0	0.0	6.8	6.8
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.0	0.1	0.0	6.0	6.0	0.0	0.0	6.8	6.8
Prop In Lane	0.71		0.26	0.00		0.00	0.02		0.00	0.00		0.08
Lane Grp Cap(c), veh/h	392	0	0	0	461	0	1109	921	0	0	1031	1051
V/C Ratio(X)	0.18	0.00	0.00	0.00	0.00	0.00	0.28	0.29	0.00	0.00	0.32	0.33
Avail Cap(c_a), veh/h	392	0	0	0	461	0	1109	921	0	0	1031	1051
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	0.0	0.0	20.1	0.0	7.2	7.2	0.0	0.0	7.3	7.3
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	0.0	0.0	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	0.0	0.0	0.0	0.1	0.0	5.6	5.0	0.0	0.0	6.3	6.4
LnGrp Delay(d),s/veh	22.1	0.0	0.0	0.0	20.1	0.0	7.8	8.0	0.0	0.0	8.2	8.1
LnGrp LOS	C				C		A	A			A	A
Approach Vol, veh/h		70			2			580			676	
Approach Delay, s/veh		22.1			20.1			7.9			8.2	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		4.9		8.8		2.1		8.0
Green Ext Time (p_c), s		0.2		4.7		0.0		3.9

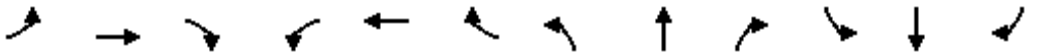
Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	28	25	54	38	15	22	501	40	24	535	30
Future Volume (veh/h)	25	28	25	54	38	15	22	501	40	24	535	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.98		0.98	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
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1827	1900	1900	1827	1900	1900	1863	1900
Adj Flow Rate, veh/h	32	36	32	90	63	25	24	551	44	26	588	33
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.77	0.77	0.77	0.60	0.60	0.60	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	4	4	4	4	4	4	2	2	2
Cap, veh/h	156	169	121	229	149	49	94	1830	144	98	1911	105
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	387	740	531	665	651	215	65	3050	239	71	3185	176
Grp Volume(v), veh/h	100	0	0	178	0	0	322	0	297	335	0	312
Grp Sat Flow(s),veh/h/ln	1658	0	0	1531	0	0	1740	0	1614	1772	0	1660
Q Serve(g_s), s	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.5
Cycle Q Clear(g_c), s	3.2	0.0	0.0	6.7	0.0	0.0	6.0	0.0	6.3	6.1	0.0	6.5
Prop In Lane	0.32		0.32	0.51		0.14	0.07		0.15	0.08		0.11
Lane Grp Cap(c), veh/h	447	0	0	427	0	0	1099	0	969	1119	0	996
V/C Ratio(X)	0.22	0.00	0.00	0.42	0.00	0.00	0.29	0.00	0.31	0.30	0.00	0.31
Avail Cap(c_a), veh/h	447	0	0	427	0	0	1099	0	969	1119	0	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	0.0	23.3	0.0	0.0	6.8	0.0	6.9	6.8	0.0	6.9
Incr Delay (d2), s/veh	1.2	0.0	0.0	3.0	0.0	0.0	0.7	0.0	0.8	0.7	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.1	0.0	0.0	6.0	0.0	0.0	5.7	0.0	5.4	5.9	0.0	5.7
LnGrp Delay(d),s/veh	23.2	0.0	0.0	26.2	0.0	0.0	7.5	0.0	7.7	7.5	0.0	7.7
LnGrp LOS	C			C			A		A	A		A
Approach Vol, veh/h		100			178			619			647	
Approach Delay, s/veh		23.2			26.2			7.6			7.6	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		5.2		8.5		8.7		8.3
Green Ext Time (p_c), s		0.3		4.6		0.5		4.4

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	535	0	0	575	0
Future Volume (vph)	0	0	0	0	0	0	0	535	0	0	575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	3539	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	3539	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		233			237			339			308	
Travel Time (s)		6.4			6.5			7.7			7.0	
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
Adj. Flow (vph)	0	0	0	0	0	0	0	582	0	0	625	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	582	0	0	625	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors								2			2	
Detector Template								Thru			Thru	
Leading Detector (ft)								100			100	
Trailing Detector (ft)								0			0	
Detector 1 Position(ft)								0			0	
Detector 1 Size(ft)								6			6	
Detector 1 Type								Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)								0.0			0.0	
Detector 1 Queue (s)								0.0			0.0	
Detector 1 Delay (s)								0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases												
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								None			None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								14.2			14.2	
Actuated g/C Ratio								0.31			0.31	
v/c Ratio								0.54			0.58	
Control Delay								15.1			15.6	
Queue Delay								0.0			0.0	
Total Delay								15.1			15.6	
LOS								B			B	
Approach Delay								15.1			15.6	
Approach LOS								B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 46.4			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 20.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)

Lane Group	Ø2
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	3.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	11	452	472	63	100	12
Future Vol, veh/h	11	452	472	63	100	12
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	13	526	502	67	118	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	569	0	-	0	1054	505
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1003	-	-	-	250	567
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1003	-	-	-	246	565
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	577	-

Approach	SE	NW	SW
HCM Control Delay, s	0.2	0	30.2
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1003	-	246	565
HCM Lane V/C Ratio	-	-	0.013	-	0.478	0.025
HCM Control Delay (s)	-	-	8.6	0	32.4	11.5
HCM Lane LOS	-	-	A	A	D	B
HCM 95th %tile Q(veh)	-	-	0	-	2.4	0.1

2045 No Build Conditions - Weekend PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	178	70	81	122	247	78	682	87	153	420	61
Future Volume (veh/h)	108	178	70	81	122	247	78	682	87	153	420	61
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	0.93		0.86	0.97		0.80	0.98		0.80
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	114	187	74	90	136	274	82	718	92	172	472	69
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.95	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	1	1	1
Cap, veh/h	106	335	132	252	137	277	466	1750	224	388	1698	245
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	0.19	0.19	0.19
Sat Flow, veh/h	991	1233	488	1058	506	1019	854	3116	399	663	3024	436
Grp Volume(v), veh/h	114	0	261	90	0	410	82	415	395	172	276	265
Grp Sat Flow(s),veh/h/ln	991	0	1720	1058	0	1524	854	1805	1710	663	1787	1673
Q Serve(g_s), s	0.2	0.0	9.1	5.6	0.0	18.8	4.3	9.2	9.2	17.0	9.3	9.5
Cycle Q Clear(g_c), s	19.0	0.0	9.1	14.7	0.0	18.8	13.8	9.2	9.2	26.2	9.3	9.5
Prop In Lane	1.00		0.28	1.00		0.67	1.00		0.23	1.00		0.26
Lane Grp Cap(c), veh/h	106	0	467	252	0	414	466	1013	960	388	1003	939
V/C Ratio(X)	1.07	0.00	0.56	0.36	0.00	0.99	0.18	0.41	0.41	0.44	0.28	0.28
Avail Cap(c_a), veh/h	106	0	467	252	0	414	466	1013	960	388	1003	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	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	35.0	0.0	21.9	28.2	0.0	25.4	12.8	8.7	8.8	27.5	16.3	16.4
Incr Delay (d2), s/veh	108.4	0.0	4.8	3.9	0.0	42.0	0.8	1.2	1.3	3.6	0.7	0.7
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.4	0.0	8.5	3.4	0.0	18.5	2.0	8.5	8.1	6.3	8.4	8.1
LnGrp Delay(d),s/veh	143.6	0.0	26.7	32.1	0.0	67.4	13.6	10.0	10.1	31.2	17.0	17.1
LnGrp LOS	F		C	C		E	B	A	B	C	B	B
Approach Vol, veh/h		375			500			892			713	
Approach Delay, s/veh		62.2			61.1			10.3			20.5	
Approach LOS		E			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		45.0		25.0		45.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		19.0		* 39		19.0		* 39
Max Q Clear Time (g_c+I1), s		21.0		28.2		20.8		15.8
Green Ext Time (p_c), s		0.0		3.7		0.0		6.2

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	5	66	57	31	76	145	511	197	117	462	34
Future Volume (veh/h)	8	5	66	57	31	76	145	511	197	117	462	34
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.75		0.61	0.73		0.61	0.90		0.63	0.87		0.63
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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	13	8	105	75	41	100	153	538	207	130	513	38
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.63	0.63	0.63	0.76	0.76	0.76	0.95	0.95	0.95	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	1	1	1
Cap, veh/h	291	21	281	303	100	243	450	1154	436	435	1718	126
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	1.00	1.00	1.00	0.53	0.53	0.53
Sat Flow, veh/h	935	71	937	946	333	811	784	2166	819	624	3225	236
Grp Volume(v), veh/h	13	0	113	75	0	141	153	447	298	130	282	269
Grp Sat Flow(s),veh/h/ln	935	0	1008	946	0	1144	784	1805	1180	624	1787	1674
Q Serve(g_s), s	0.8	0.0	6.2	4.8	0.0	6.9	3.6	0.0	0.0	8.6	6.1	6.3
Cycle Q Clear(g_c), s	7.7	0.0	6.2	10.9	0.0	6.9	9.9	0.0	0.0	8.6	6.1	6.3
Prop In Lane	1.00		0.93	1.00		0.71	1.00		0.69	1.00		0.14
Lane Grp Cap(c), veh/h	291	0	302	303	0	343	450	962	629	435	952	892
V/C Ratio(X)	0.04	0.00	0.37	0.25	0.00	0.41	0.34	0.46	0.47	0.30	0.30	0.30
Avail Cap(c_a), veh/h	291	0	302	303	0	343	450	962	629	435	952	892
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	0.0	19.3	23.6	0.0	19.6	0.8	0.0	0.0	9.6	9.1	9.1
Incr Delay (d2), s/veh	0.3	0.0	3.5	1.9	0.0	3.6	2.0	1.6	2.6	1.8	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(95%),veh/ln	0.4	0.0	3.6	2.5	0.0	4.5	1.8	0.8	0.8	3.0	5.7	5.5
LnGrp Delay(d),s/veh	22.9	0.0	22.8	25.6	0.0	23.2	2.9	1.6	2.6	11.4	9.9	10.0
LnGrp LOS	C		C	C		C	A	A	A	B	A	A
Approach Vol, veh/h		126			216			898			681	
Approach Delay, s/veh		22.8			24.0			2.1			10.2	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		9.7		10.6		12.9		11.9
Green Ext Time (p_c), s		0.7		5.1		0.9		7.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	16	0	1	2	39	483	6	1	676	68
Future Volume (veh/h)	16	0	16	0	1	2	39	483	6	1	676	68
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.67		0.66	1.00		0.66	0.98		0.71	0.93		0.71
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1900	1810	1900	1900	1845	1900
Adj Flow Rate, veh/h	27	0	27	0	2	3	41	508	6	1	777	78
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	182	19	124	0	126	189	150	1731	20	52	1776	178
Arrive On Green	0.24	0.00	0.24	0.00	0.24	0.24	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	434	78	512	0	519	779	155	2941	34	0	3018	302
Grp Volume(v), veh/h	54	0	0	0	0	5	272	0	283	475	0	381
Grp Sat Flow(s),veh/h/ln	1024	0	0	0	0	1298	1507	0	1624	1844	0	1477
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0	6.1	0.0	0.0	10.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.0	0.0	0.2	5.1	0.0	6.1	10.0	0.0	10.0
Prop In Lane	0.50		0.50	0.00		0.60	0.15		0.02	0.00		0.20
Lane Grp Cap(c), veh/h	326	0	0	0	0	315	946	0	956	1137	0	869
V/C Ratio(X)	0.17	0.00	0.00	0.00	0.00	0.02	0.29	0.00	0.30	0.42	0.00	0.44
Avail Cap(c_a), veh/h	326	0	0	0	0	315	946	0	956	1137	0	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	0.0	0.0	20.1	7.0	0.0	7.2	8.0	0.0	8.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.8	1.1	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	0.0	0.0	0.0	0.0	0.1	4.9	0.0	5.2	9.2	0.0	7.9
LnGrp Delay(d),s/veh	22.0	0.0	0.0	0.0	0.0	20.2	7.7	0.0	8.0	9.1	0.0	9.6
LnGrp LOS	C					C	A		A	A		A
Approach Vol, veh/h		54			5			555			856	
Approach Delay, s/veh		22.0			20.2			7.9			9.3	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		4.3		12.0		2.2		8.1
Green Ext Time (p_c), s		0.2		6.4		0.0		4.1

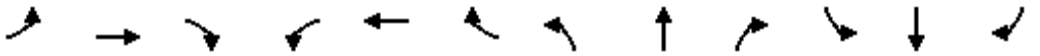
Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	26	40	64	17	30	28	412	67	24	668	20
Future Volume (veh/h)	21	26	40	64	17	30	28	412	67	24	668	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.80		0.70	0.78		0.70	0.98		0.84	0.96		0.84
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1900	1900	1900	1900	1900	1881	1900
Adj Flow Rate, veh/h	27	33	51	93	25	43	31	453	74	26	726	22
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.79	0.79	0.79	0.69	0.69	0.69	0.91	0.91	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	112	121	144	228	64	77	122	1638	261	87	2001	60
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	212	531	632	643	279	336	108	2730	435	54	3334	99
Grp Volume(v), veh/h	111	0	0	161	0	0	294	0	264	404	0	370
Grp Sat Flow(s),veh/h/ln	1375	0	0	1258	0	0	1719	0	1554	1815	0	1672
Q Serve(g_s), s	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	5.7	0.0	0.0	8.0
Cycle Q Clear(g_c), s	4.5	0.0	0.0	6.9	0.0	0.0	5.1	0.0	5.7	7.6	0.0	8.0
Prop In Lane	0.24		0.46	0.58		0.27	0.11		0.28	0.06		0.06
Lane Grp Cap(c), veh/h	378	0	0	369	0	0	1088	0	932	1144	0	1003
V/C Ratio(X)	0.29	0.00	0.00	0.44	0.00	0.00	0.27	0.00	0.28	0.35	0.00	0.37
Avail Cap(c_a), veh/h	378	0	0	369	0	0	1088	0	932	1144	0	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.6	0.0	0.0	23.3	0.0	0.0	6.6	0.0	6.7	7.1	0.0	7.2
Incr Delay (d2), s/veh	2.0	0.0	0.0	3.7	0.0	0.0	0.6	0.0	0.8	0.9	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(95%),veh/ln	3.6	0.0	0.0	5.5	0.0	0.0	5.0	0.0	4.7	7.6	0.0	7.0
LnGrp Delay(d),s/veh	24.5	0.0	0.0	27.0	0.0	0.0	7.2	0.0	7.5	8.0	0.0	8.2
LnGrp LOS	C			C			A		A	A		A
Approach Vol, veh/h		111			161			558			774	
Approach Delay, s/veh		24.5			27.0			7.4			8.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		6.5		10.0		8.9		7.7
Green Ext Time (p_c), s		0.4		5.6		0.6		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	595	0	0	614	0
Future Volume (vph)	0	0	0	0	0	0	0	595	0	0	614	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	3539	0	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	3539	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		231			269			332			342	
Travel Time (s)		6.3			7.3			7.5			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0	0	647	0	0	667	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	647	0	0	667	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors								2			2	
Detector Template								Thru			Thru	
Leading Detector (ft)								100			100	
Trailing Detector (ft)								0			0	
Detector 1 Position(ft)								0			0	
Detector 1 Size(ft)								6			6	
Detector 1 Type								Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)								0.0			0.0	
Detector 1 Queue (s)								0.0			0.0	
Detector 1 Delay (s)								0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases												
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								None			None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								15.2			15.2	
Actuated g/C Ratio								0.32			0.32	
v/c Ratio								0.57			0.59	
Control Delay								15.3			15.5	
Queue Delay								0.0			0.0	
Total Delay								15.3			15.5	
LOS								B			B	
Approach Delay								15.3			15.5	
Approach LOS								B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 47.4			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 22.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)

Lane Group	Ø2
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	51
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	225.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	108	498	743	462	281	136
Future Vol, veh/h	108	498	743	462	281	136
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	126	579	790	491	331	160

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1281	0	-	0	1622	790
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	832	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	542	-	-	-	~ 113	390
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	427	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	542	-	-	-	~ 74	390
Mov Cap-2 Maneuver	-	-	-	-	~ 74	-
Stage 1	-	-	-	-	~ 294	-
Stage 2	-	-	-	-	427	-

Approach	SE	NW	SW
HCM Control Delay, s	2.4	0	$ 1134.9
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	542	-	74	390
HCM Lane V/C Ratio	-	-	0.232	-	4.467	0.41
HCM Control Delay (s)	-	-	13.6	$	1674.3	20.5
HCM Lane LOS	-	-	B	A	F	C
HCM 95th %tile Q(veh)	-	-	0.9	-	35.6	2

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

2045 Three-Lane Conditions - Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	87	32	33	77	152	28	410	26	141	495	86
Future Volume (veh/h)	66	87	32	33	77	152	28	410	26	141	495	86
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	0.99		0.99	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
Adj Sat Flow, veh/h/ln	1792	1792	1900	1827	1827	1900	1792	1792	1900	1845	1845	1900
Adj Flow Rate, veh/h	81	107	40	43	100	197	32	466	30	158	556	97
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.81	0.81	0.81	0.77	0.77	0.77	0.88	0.88	0.88	0.89	0.89	0.89
Percent Heavy Veh, %	6	6	6	4	4	4	6	6	6	3	3	3
Cap, veh/h	215	337	126	347	149	293	521	935	60	450	858	150
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.56	0.56	0.56	1.00	1.00	1.00
Sat Flow, veh/h	1033	1241	464	1204	547	1078	745	1666	107	889	1529	267
Grp Volume(v), veh/h	81	0	147	43	0	297	32	0	496	158	0	653
Grp Sat Flow(s),veh/h/ln	1033	0	1705	1204	0	1625	745	0	1773	889	0	1796
Q Serve(g_s), s	5.3	0.0	4.8	2.1	0.0	11.4	1.4	0.0	11.9	5.5	0.0	0.0
Cycle Q Clear(g_c), s	16.7	0.0	4.8	6.9	0.0	11.4	1.4	0.0	11.9	17.5	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.66	1.00		0.06	1.00		0.15
Lane Grp Cap(c), veh/h	215	0	463	347	0	441	521	0	995	450	0	1008
V/C Ratio(X)	0.38	0.00	0.32	0.12	0.00	0.67	0.06	0.00	0.50	0.35	0.00	0.65
Avail Cap(c_a), veh/h	215	0	463	347	0	441	521	0	995	450	0	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	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	30.2	0.0	20.3	23.1	0.0	22.7	7.0	0.0	9.3	2.6	0.0	0.0
Incr Delay (d2), s/veh	5.0	0.0	1.8	0.7	0.0	8.0	0.2	0.0	1.8	2.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	0.0	4.5	1.4	0.0	10.1	0.6	0.0	10.4	2.8	0.0	1.6
LnGrp Delay(d),s/veh	35.2	0.0	22.1	23.8	0.0	30.7	7.3	0.0	11.1	4.8	0.0	3.2
LnGrp LOS	D		C	C		C	A		B	A		A
Approach Vol, veh/h		228			340			528			811	
Approach Delay, s/veh		26.8			29.8			10.9			3.5	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		25.0		45.0		25.0		45.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		19.0		* 39		19.0		* 39
Max Q Clear Time (g_c+I1), s		18.7		19.5		13.4		13.9
Green Ext Time (p_c), s		0.0		5.6		1.0		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	5	103	29	9	40	62	484	36	38	525	13
Future Volume (veh/h)	11	5	103	29	9	40	62	484	36	38	525	13
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.98		0.97	1.00		0.89	0.95		0.89
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1827	1827	1900	1845	1845	1900
Adj Flow Rate, veh/h	13	6	118	36	11	49	66	515	38	45	625	15
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.81	0.81	0.81	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	3	3	3
Cap, veh/h	459	23	444	402	88	394	320	887	65	529	953	23
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	1.00	1.00	1.00	0.53	0.53	0.53
Sat Flow, veh/h	1306	75	1479	1249	295	1313	771	1664	123	799	1788	43
Grp Volume(v), veh/h	13	0	124	36	0	60	66	0	553	45	0	640
Grp Sat Flow(s),veh/h/ln	1306	0	1554	1249	0	1607	771	0	1787	799	0	1831
Q Serve(g_s), s	0.5	0.0	4.2	1.6	0.0	1.9	3.4	0.0	0.0	2.0	0.0	17.6
Cycle Q Clear(g_c), s	2.4	0.0	4.2	5.8	0.0	1.9	20.9	0.0	0.0	2.0	0.0	17.6
Prop In Lane	1.00		0.95	1.00		0.82	1.00		0.07	1.00		0.02
Lane Grp Cap(c), veh/h	459	0	466	402	0	482	320	0	952	529	0	975
V/C Ratio(X)	0.03	0.00	0.27	0.09	0.00	0.12	0.21	0.00	0.58	0.09	0.00	0.66
Avail Cap(c_a), veh/h	459	0	466	402	0	482	320	0	952	529	0	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	18.6	20.9	0.0	17.8	4.9	0.0	0.0	8.1	0.0	11.7
Incr Delay (d2), s/veh	0.1	0.0	1.4	0.4	0.0	0.5	1.5	0.0	2.6	0.3	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	3.6	1.1	0.0	1.6	1.5	0.0	1.2	0.8	0.0	14.7
LnGrp Delay(d),s/veh	18.8	0.0	20.0	21.3	0.0	18.3	6.4	0.0	2.6	8.4	0.0	15.2
LnGrp LOS	B		C	C		B	A		A	A		B
Approach Vol, veh/h		137			96			619			685	
Approach Delay, s/veh		19.9			19.5			3.0			14.7	
Approach LOS		B			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		6.2		19.6		7.8		22.9
Green Ext Time (p_c), s		0.6		4.5		0.3		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1	11	0	1	0	7	544	0	0	563	25
Future Volume (veh/h)	30	1	11	0	1	0	7	544	0	0	563	25
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.75		0.74	1.00		1.00	1.00		1.00	1.00		0.85
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1810	1810	1900	1845	1845	1900
Adj Flow Rate, veh/h	50	2	18	0	2	0	7	573	0	0	647	29
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	267	21	69	0	461	0	357	1065	0	103	1022	46
Arrive On Green	0.24	0.24	0.24	0.00	0.24	0.00	0.59	0.59	0.00	0.00	0.59	0.59
Sat Flow, veh/h	738	86	285	0	1900	0	738	1810	0	828	1737	78
Grp Volume(v), veh/h	70	0	0	0	2	0	7	573	0	0	0	676
Grp Sat Flow(s),veh/h/ln	1109	0	0	0	1900	0	738	1810	0	828	0	1815
Q Serve(g_s), s	2.4	0.0	0.0	0.0	0.1	0.0	0.4	13.3	0.0	0.0	0.0	17.1
Cycle Q Clear(g_c), s	3.2	0.0	0.0	0.0	0.1	0.0	17.5	13.3	0.0	0.0	0.0	17.1
Prop In Lane	0.71		0.26	0.00		0.00	1.00		0.00	1.00		0.04
Lane Grp Cap(c), veh/h	358	0	0	0	461	0	357	1065	0	103	0	1068
V/C Ratio(X)	0.20	0.00	0.00	0.00	0.00	0.00	0.02	0.54	0.00	0.00	0.00	0.63
Avail Cap(c_a), veh/h	358	0	0	0	461	0	357	1065	0	103	0	1068
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	0.0	20.1	0.0	15.2	8.7	0.0	0.0	0.0	9.4
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.0	0.0	0.0	0.1	1.9	0.0	0.0	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.2	0.0	0.0	0.0	0.1	0.0	0.2	11.5	0.0	0.0	0.0	14.3
LnGrp Delay(d),s/veh	22.4	0.0	0.0	0.0	20.1	0.0	15.3	10.6	0.0	0.0	0.0	12.3
LnGrp LOS	C				C		B	B				B
Approach Vol, veh/h		70			2			580			676	
Approach Delay, s/veh		22.4			20.1			10.7			12.3	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		5.2		19.1		2.1		19.5
Green Ext Time (p_c), s		0.3		4.9		0.0		3.9

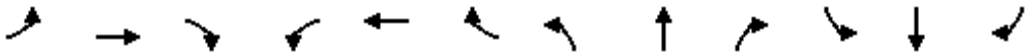
Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	28	25	54	38	15	22	501	40	24	535	30
Future Volume (veh/h)	25	28	25	54	38	15	22	501	40	24	535	30
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.97		0.98	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
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1827	1900	1827	1827	1900	1863	1863	1900
Adj Flow Rate, veh/h	32	36	32	90	63	25	24	551	44	26	588	33
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.77	0.77	0.77	0.60	0.60	0.60	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	4	4	4	4	4	4	2	2	2
Cap, veh/h	156	169	121	228	148	49	414	1000	80	433	1047	59
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	386	738	529	661	649	214	784	1667	133	819	1745	98
Grp Volume(v), veh/h	100	0	0	178	0	0	24	0	595	26	0	621
Grp Sat Flow(s),veh/h/ln	1653	0	0	1523	0	0	784	0	1800	819	0	1843
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	1.3	0.0	13.8	1.4	0.0	14.2
Cycle Q Clear(g_c), s	3.3	0.0	0.0	6.7	0.0	0.0	15.6	0.0	13.8	15.2	0.0	14.2
Prop In Lane	0.32		0.32	0.51		0.14	1.00		0.07	1.00		0.05
Lane Grp Cap(c), veh/h	446	0	0	426	0	0	414	0	1080	433	0	1106
V/C Ratio(X)	0.22	0.00	0.00	0.42	0.00	0.00	0.06	0.00	0.55	0.06	0.00	0.56
Avail Cap(c_a), veh/h	446	0	0	426	0	0	414	0	1080	433	0	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	0.0	23.3	0.0	0.0	13.1	0.0	8.4	12.9	0.0	8.4
Incr Delay (d2), s/veh	1.2	0.0	0.0	3.0	0.0	0.0	0.3	0.0	2.0	0.3	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.1	0.0	0.0	6.0	0.0	0.0	0.6	0.0	11.8	0.6	0.0	12.3
LnGrp Delay(d),s/veh	23.2	0.0	0.0	26.3	0.0	0.0	13.4	0.0	10.4	13.2	0.0	10.5
LnGrp LOS	C			C			B		B	B		B
Approach Vol, veh/h		100			178			619			647	
Approach Delay, s/veh		23.2			26.3			10.5			10.6	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		5.3		17.2		8.7		17.6
Green Ext Time (p_c), s		0.3		4.7		0.5		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B



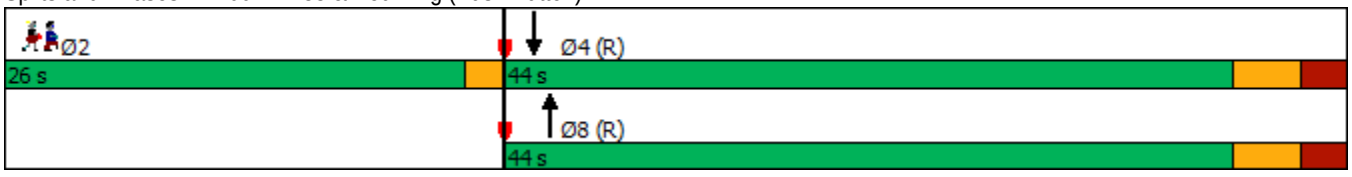
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	535	0	0	575	0
Future Volume (vph)	0	0	0	0	0	0	0	535	0	0	575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	1863	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	1863	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		195			225			321			324	
Travel Time (s)		4.4			5.1			5.5			5.5	
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
Adj. Flow (vph)	0	0	0	0	0	0	0	582	0	0	625	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	582	0	0	625	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors								2			2	
Detector Template								Thru			Thru	
Leading Detector (ft)								100			100	
Trailing Detector (ft)								0			0	
Detector 1 Position(ft)								0			0	
Detector 1 Size(ft)								6			6	
Detector 1 Type								Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)								0.0			0.0	
Detector 1 Queue (s)								0.0			0.0	
Detector 1 Delay (s)								0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases												
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								C-Max			C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								38.0			38.0	
Actuated g/C Ratio								0.54			0.54	
v/c Ratio								0.58			0.62	
Control Delay								6.2			9.9	
Queue Delay								0.2			0.0	
Total Delay								6.4			9.9	
LOS								A			A	
Approach Delay								6.4			9.9	
Approach LOS								A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 58 (83%), Referenced to phase 4:SBT and 8:NBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 35.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)



Lane Group	Ø2
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	3.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	11	452	472	63	100	12
Future Vol, veh/h	11	452	472	63	100	12
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	13	526	502	67	118	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	569	0	-	0	1054	505
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1003	-	-	-	250	567
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1003	-	-	-	247	565
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	577	-

Approach	SE	NW	SW
HCM Control Delay, s	0.2	0	30
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1003	-	247	565
HCM Lane V/C Ratio	-	-	0.013	-	0.476	0.025
HCM Control Delay (s)	-	-	8.6	-	32.2	11.5
HCM Lane LOS	-	-	A	-	D	B
HCM 95th %tile Q(veh)	-	-	0	-	2.4	0.1

2045 Three-Lane Conditions - Weekend PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	178	70	81	122	247	78	682	87	153	420	61
Future Volume (veh/h)	108	178	70	81	122	247	78	682	87	153	420	61
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	0.91		0.81	1.00		0.77	1.00		0.77
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	114	187	74	90	136	274	82	718	92	172	472	69
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.95	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	1	1	1
Cap, veh/h	167	396	157	316	159	319	321	802	103	168	776	113
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.50	0.50	0.50	0.34	0.34	0.34
Sat Flow, veh/h	991	1205	477	1039	482	972	878	1590	204	677	1539	225
Grp Volume(v), veh/h	114	0	261	90	0	410	82	0	810	172	0	541
Grp Sat Flow(s),veh/h/ln	991	0	1682	1039	0	1455	878	0	1794	677	0	1764
Q Serve(g_s), s	4.6	0.0	8.6	5.3	0.0	18.4	5.4	0.0	28.6	6.7	0.0	17.9
Cycle Q Clear(g_c), s	23.0	0.0	8.6	13.9	0.0	18.4	23.3	0.0	28.6	35.3	0.0	17.9
Prop In Lane	1.00		0.28	1.00		0.67	1.00		0.11	1.00		0.13
Lane Grp Cap(c), veh/h	167	0	552	316	0	478	321	0	905	168	0	890
V/C Ratio(X)	0.68	0.00	0.47	0.28	0.00	0.86	0.26	0.00	0.90	1.02	0.00	0.61
Avail Cap(c_a), veh/h	167	0	552	316	0	478	321	0	905	168	0	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	18.7	24.2	0.0	22.0	21.8	0.0	15.7	39.5	0.0	17.4
Incr Delay (d2), s/veh	20.2	0.0	2.9	2.3	0.0	17.8	1.9	0.0	13.3	75.8	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	0.0	7.9	3.1	0.0	14.9	2.6	0.0	24.1	12.2	0.0	14.5
LnGrp Delay(d),s/veh	53.9	0.0	21.6	26.5	0.0	39.8	23.7	0.0	29.0	115.6	0.0	20.5
LnGrp LOS	D		C	C		D	C		C	F		C
Approach Vol, veh/h		375			500			892			713	
Approach Delay, s/veh		31.4			37.4			28.5			43.4	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		29.0		41.0		29.0		41.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		23.0		* 35		23.0		* 35
Max Q Clear Time (g_c+I1), s		25.0		37.3		20.4		30.6
Green Ext Time (p_c), s		0.0		0.0		0.9		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	5	66	57	31	76	145	511	197	117	462	34
Future Volume (veh/h)	8	5	66	57	31	76	145	511	197	117	462	34
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.67		0.35	0.65		0.35	1.00		0.63	0.87		0.63
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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1900	1900	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	13	8	105	75	41	100	153	538	207	130	513	38
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.63	0.63	0.63	0.76	0.76	0.76	0.95	0.95	0.95	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	1	1	1
Cap, veh/h	209	12	163	215	62	150	318	588	226	435	880	65
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	1.00	1.00	1.00	0.18	0.18	0.18
Sat Flow, veh/h	842	41	545	842	206	502	870	1103	424	624	1651	122
Grp Volume(v), veh/h	13	0	113	75	0	141	153	0	745	130	0	551
Grp Sat Flow(s),veh/h/ln	842	0	586	842	0	707	870	0	1527	624	0	1774
Q Serve(g_s), s	1.0	0.0	11.7	5.9	0.0	12.2	9.8	0.0	0.0	12.9	0.0	20.0
Cycle Q Clear(g_c), s	13.2	0.0	11.7	17.6	0.0	12.2	29.8	0.0	0.0	12.9	0.0	20.0
Prop In Lane	1.00		0.93	1.00		0.71	1.00		0.28	1.00		0.07
Lane Grp Cap(c), veh/h	209	0	176	215	0	212	318	0	814	435	0	945
V/C Ratio(X)	0.06	0.00	0.64	0.35	0.00	0.66	0.48	0.00	0.92	0.30	0.00	0.58
Avail Cap(c_a), veh/h	209	0	176	215	0	212	318	0	814	435	0	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
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	27.2	0.0	21.2	28.9	0.0	21.4	8.0	0.0	0.0	18.8	0.0	21.7
Incr Delay (d2), s/veh	0.6	0.0	16.7	4.4	0.0	15.3	5.1	0.0	16.7	1.8	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(95%),veh/ln	0.5	0.0	4.9	3.0	0.0	5.8	5.0	0.0	6.8	4.4	0.0	15.8
LnGrp Delay(d),s/veh	27.7	0.0	37.9	33.3	0.0	36.7	13.1	0.0	16.7	20.5	0.0	24.3
LnGrp LOS	C		D	C		D	B		B	C		C
Approach Vol, veh/h		126			216			898			681	
Approach Delay, s/veh		36.9			35.5			16.1			23.6	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.0		43.0		27.0		43.0
Change Period (Y+Rc), s		6.0		* 5.7		6.0		* 5.7
Max Green Setting (Gmax), s		21.0		* 37		21.0		* 37
Max Q Clear Time (g_c+I1), s		15.2		22.0		19.6		31.8
Green Ext Time (p_c), s		0.6		4.5		0.3		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	16	0	1	2	39	483	6	1	676	68
Future Volume (veh/h)	16	0	16	0	1	2	39	483	6	1	676	68
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.45		0.44	1.00		0.44	1.00		0.71	1.00		0.71
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
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1900	1900	1810	1810	1900	1845	1845	1900
Adj Flow Rate, veh/h	27	0	27	0	2	3	41	508	6	1	777	78
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.95	0.95	0.95	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	0	0	0	5	5	5	3	3	3
Cap, veh/h	147	14	85	0	92	138	222	1044	12	395	930	93
Arrive On Green	0.24	0.00	0.24	0.00	0.24	0.24	0.19	0.19	0.19	0.59	0.59	0.59
Sat Flow, veh/h	290	59	348	0	379	568	625	1775	21	874	1580	159
Grp Volume(v), veh/h	54	0	0	0	0	5	41	0	514	1	0	855
Grp Sat Flow(s),veh/h/ln	697	0	0	0	0	947	625	0	1796	874	0	1739
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	0.3	4.4	0.0	17.8	0.1	0.0	27.9
Cycle Q Clear(g_c), s	3.6	0.0	0.0	0.0	0.0	0.3	32.3	0.0	17.8	17.9	0.0	27.9
Prop In Lane	0.50		0.50	0.00		0.60	1.00		0.01	1.00		0.09
Lane Grp Cap(c), veh/h	246	0	0	0	0	230	222	0	1057	395	0	1023
V/C Ratio(X)	0.22	0.00	0.00	0.00	0.00	0.02	0.18	0.00	0.49	0.00	0.00	0.84
Avail Cap(c_a), veh/h	246	0	0	0	0	230	222	0	1057	395	0	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	0.0	0.0	0.0	20.2	38.0	0.0	18.8	15.5	0.0	11.7
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.0	0.0	0.2	1.8	0.0	1.6	0.0	0.0	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.8	0.0	0.0	0.0	0.0	0.2	1.6	0.0	14.3	0.0	0.0	21.8
LnGrp Delay(d),s/veh	23.3	0.0	0.0	0.0	0.0	20.3	39.8	0.0	20.4	15.6	0.0	19.7
LnGrp LOS	C					C	D		C	B		B
Approach Vol, veh/h		54			5			555			856	
Approach Delay, s/veh		23.3			20.3			21.8			19.7	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.0		47.0		23.0		47.0
Change Period (Y+Rc), s		6.0		* 5.8		6.0		* 5.8
Max Green Setting (Gmax), s		17.0		* 41		17.0		* 41
Max Q Clear Time (g_c+I1), s		5.6		29.9		2.3		34.3
Green Ext Time (p_c), s		0.3		5.0		0.0		2.1

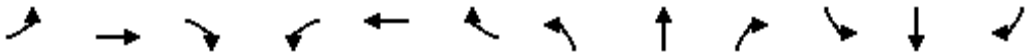
Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	26	40	64	17	30	28	412	67	24	668	20
Future Volume (veh/h)	21	26	40	64	17	30	28	412	67	24	668	20
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.81		0.50	0.65		0.70	1.00		0.84	0.99		0.84
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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	27	33	51	93	25	43	31	453	74	26	726	22
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.79	0.79	0.79	0.69	0.69	0.69	0.91	0.91	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	1	1	1	0	0	0	1	1	1
Cap, veh/h	108	104	125	213	60	70	343	928	152	483	1083	33
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	191	454	549	577	262	305	725	1546	253	875	1805	55
Grp Volume(v), veh/h	111	0	0	161	0	0	31	0	527	26	0	748
Grp Sat Flow(s),veh/h/ln	1195	0	0	1144	0	0	725	0	1798	875	0	1859
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	0.0	2.1	0.0	11.6	1.2	0.0	18.8
Cycle Q Clear(g_c), s	5.6	0.0	0.0	7.7	0.0	0.0	20.9	0.0	11.6	12.8	0.0	18.8
Prop In Lane	0.24		0.46	0.58		0.27	1.00		0.14	1.00		0.03
Lane Grp Cap(c), veh/h	337	0	0	343	0	0	343	0	1079	483	0	1116
V/C Ratio(X)	0.33	0.00	0.00	0.47	0.00	0.00	0.09	0.00	0.49	0.05	0.00	0.67
Avail Cap(c_a), veh/h	337	0	0	343	0	0	343	0	1079	483	0	1116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	0.0	23.5	0.0	0.0	16.4	0.0	7.9	11.5	0.0	9.4
Incr Delay (d2), s/veh	2.6	0.0	0.0	4.6	0.0	0.0	0.5	0.0	1.6	0.2	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.7	0.0	0.0	5.7	0.0	0.0	0.8	0.0	10.3	0.6	0.0	15.9
LnGrp Delay(d),s/veh	25.6	0.0	0.0	28.1	0.0	0.0	16.9	0.0	9.5	11.8	0.0	12.6
LnGrp LOS	C			C			B		A	B		B
Approach Vol, veh/h		111			161			558			774	
Approach Delay, s/veh		25.6			28.1			9.9			12.6	
Approach LOS		C			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		22.0		48.0		22.0		48.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		16.0		42.0		16.0		42.0
Max Q Clear Time (g_c+I1), s		7.6		20.8		9.7		22.9
Green Ext Time (p_c), s		0.4		5.7		0.6		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B



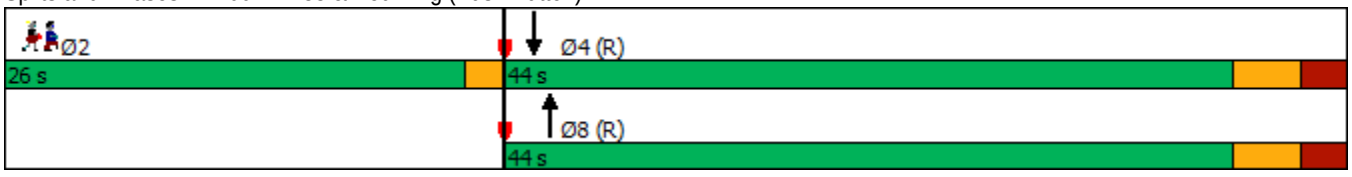
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	595	0	0	614	0
Future Volume (vph)	0	0	0	0	0	0	0	595	0	0	614	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	0	0	0	1863	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	0	0	0	1863	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		192			203			335			352	
Travel Time (s)		5.2			5.5			7.6			8.0	
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
Adj. Flow (vph)	0	0	0	0	0	0	0	647	0	0	667	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	647	0	0	667	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors								2			2	
Detector Template								Thru			Thru	
Leading Detector (ft)								100			100	
Trailing Detector (ft)								0			0	
Detector 1 Position(ft)								0			0	
Detector 1 Size(ft)								6			6	
Detector 1 Type								Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)								0.0			0.0	
Detector 1 Queue (s)								0.0			0.0	
Detector 1 Delay (s)								0.0			0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type								NA			NA	
Protected Phases								8			4	
Permitted Phases												
Detector Phase								8			4	
Switch Phase												
Minimum Initial (s)								10.0			10.0	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)								16.0			16.0	
Total Split (s)								44.0			44.0	
Total Split (%)								62.9%			62.9%	
Maximum Green (s)								38.0			38.0	
Yellow Time (s)								3.5			3.5	
All-Red Time (s)								2.5			2.5	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0			3.0	
Recall Mode								C-Max			C-Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)								38.0			38.0	
Actuated g/C Ratio								0.54			0.54	
v/c Ratio								0.64			0.66	
Control Delay								13.9			16.6	
Queue Delay								10.7			20.8	
Total Delay								24.6			37.4	
LOS								C			D	
Approach Delay								24.6			37.4	
Approach LOS								C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 26 (37%), Referenced to phase 4:SBT and 8:NBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 31.1		Intersection LOS: C	
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1004: M-83 & Ped Xing (Push Button)



Lane Group	Ø2
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	37%
Maximum Green (s)	24.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	51
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	183.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	108	498	743	462	281	136
Future Vol, veh/h	108	498	743	462	281	136
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	170	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	94	94	85	85
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	126	579	790	491	331	160

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1281	0	-	0	1622	790
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	832	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	542	-	-	-	~ 113	390
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	427	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	542	-	-	-	~ 87	390
Mov Cap-2 Maneuver	-	-	-	-	~ 87	-
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	427	-

Approach	SE	NW	SW
HCM Control Delay, s	2.4	0	$ 923.3
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	542	-	87	390
HCM Lane V/C Ratio	-	-	0.232	-	3.8	0.41
HCM Control Delay (s)	-	-	13.6	$ 1360.2		20.5
HCM Lane LOS	-	-	B	-	F	C
HCM 95th %tile Q(veh)	-	-	0.9	-	34.1	2

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

Appendix B - Existing Conditions SimTraffic Results

Existing Conditions - Weekday PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.9	0.4	0.4	3.7	0.3	0.3	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	26.2	18.8	7.7	23.9	19.7	8.3	12.5	7.9	3.4	12.5	4.7	2.6

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	9.3

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	19.6	21.1	4.5	15.6	19.1	5.8	13.3	6.8	5.0	21.2	11.9	8.3

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	9.6

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	11.3	9.6	10.5

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	24.6	14.2	10.5	8.3	16.2	8.8	3.6	2.5	6.8

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.3	0.1	0.2
Total Del/Veh (s)	21.9	20.8	9.8	21.9	22.9	11.7	10.3	5.4	2.1	10.7	7.3	2.5

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	8.3

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.0	0.0	0.4	3.4	0.2	0.1	0.4
Total Del/Veh (s)	2.8	1.1	0.5	0.2	8.6	4.1	1.5

Total Zone Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	436.0

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	98	111	59	152	46	105	104	88	81	91
Average Queue (ft)	36	47	18	68	13	49	49	37	25	40
95th Queue (ft)	80	94	48	125	40	89	94	75	63	77
Link Distance (ft)		366		381		1880	1880		595	595
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140		120		80			90		
Storage Blk Time (%)		0		1	0	1		0	0	
Queuing Penalty (veh)		0		0	0	0		1	0	

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	66	46	46	55	98	121	54	180	191
Average Queue (ft)	5	29	13	15	20	38	53	15	83	86
95th Queue (ft)	20	55	37	39	45	80	99	41	159	159
Link Distance (ft)	170	170	148	148		810	810		241	241
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (ft)					95			95		
Storage Blk Time (%)						0			6	
Queuing Penalty (veh)						0			2	

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	172	185	157	148
Average Queue (ft)	75	87	76	75
95th Queue (ft)	139	154	132	136
Link Distance (ft)	241	241	320	320
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	90	11	179	186	86	81
Average Queue (ft)	31	0	85	96	36	31
95th Queue (ft)	73	6	158	170	71	70
Link Distance (ft)	145	174	218	218	441	441
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	95	148	116	115	150	98
Average Queue (ft)	39	53	47	52	70	23
95th Queue (ft)	79	105	94	98	125	64
Link Distance (ft)	253	282	111	111	583	583
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			1	1		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9001: M-83 & Weiss St

Movement	SE	NW	SW	SW
Directions Served	LT	R	L	R
Maximum Queue (ft)	33	5	77	31
Average Queue (ft)	3	0	34	8
95th Queue (ft)	17	4	61	30
Link Distance (ft)	1026		256	256
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		170		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 5

Existing Conditions - Weekend PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	8.4	3.5	2.4	3.7	0.4	0.5	0.1	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	70.4	29.5	19.8	34.5	38.4	30.7	16.4	9.0	9.8	22.6	5.1	3.6

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	18.7

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	25.6	20.8	11.9	32.8	24.7	17.3	19.4	9.9	23.1	129.9	13.3	11.7

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	22.6

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	10.2	14.3	12.3

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.0	0.0	0.0		0.0	0.0	0.0
Total Del/Veh (s)	28.8	13.4	39.7	11.6	27.0	10.8	14.0		4.4	6.7	8.0

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.3	0.2	0.2
Total Del/Veh (s)	22.5	25.3	11.5	31.5	28.6	18.3	12.8	5.6	3.4	13.4	7.4	3.2

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	9.2

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.0	0.0	1.4	3.1	194.4	189.8	39.0
Total Del/Veh (s)	11.3	6.3	2.5	2.0	145.5	21.1	22.7

Total Zone Performance

Denied Del/Veh (s)	22.8
Total Del/Veh (s)	792.9

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	140	220	150	289	70	113	142	138	113	83
Average Queue (ft)	66	103	53	127	33	63	76	59	31	38
95th Queue (ft)	140	229	129	243	65	106	124	108	77	72
Link Distance (ft)		366		381		1880	1880		595	595
Upstream Blk Time (%)		4		0						
Queuing Penalty (veh)		0		0						
Storage Bay Dist (ft)	140		120		80			90		
Storage Blk Time (%)	6	3	0	19	0	3		3	0	
Queuing Penalty (veh)	11	2	0	12	0	2		6	0	

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	19	71	83	98	120	166	197	170	266	247
Average Queue (ft)	4	26	33	40	46	61	109	97	119	87
95th Queue (ft)	17	55	71	80	90	132	178	189	267	185
Link Distance (ft)	169	169	148	148		810	810		262	262
Upstream Blk Time (%)				0					9	0
Queuing Penalty (veh)				0					25	1
Storage Bay Dist (ft)					95			95		
Storage Blk Time (%)					1	1		35	4	
Queuing Penalty (veh)					2	1		72	4	

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	164	173	215	206
Average Queue (ft)	76	77	94	76
95th Queue (ft)	135	140	205	162
Link Distance (ft)	262	262	294	294
Upstream Blk Time (%)		0	4	0
Queuing Penalty (veh)		0	9	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	76	28	174	177	148	138
Average Queue (ft)	24	3	85	88	48	49
95th Queue (ft)	59	18	151	156	101	108
Link Distance (ft)	145	174	223	223	441	441
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	80	121	93	97	170	134
Average Queue (ft)	38	58	42	49	74	33
95th Queue (ft)	70	109	80	87	131	87
Link Distance (ft)	253	282	111	111	583	583
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9001: M-83 & Weiss St

Movement	SE	NW	NW	SW	SW
Directions Served	LT	T	R	L	R
Maximum Queue (ft)	286	10	51	303	290
Average Queue (ft)	76	0	6	229	190
95th Queue (ft)	190	5	28	352	369
Link Distance (ft)	1004	803		256	256
Upstream Blk Time (%)				63	41
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)			170		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 149

Appendix C - No Build Conditions SimTraffic Results

2045 No Build Conditions - Weekday PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.8	0.4	0.3	3.6	0.4	0.4	0.1	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	28.0	18.8	9.0	24.6	23.0	12.6	18.8	8.3	6.2	15.4	5.7	4.3

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	10.9

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	18.8	16.6	5.5	19.6	22.6	5.7	15.0	7.1	6.6	25.5	12.2	9.3

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	10.3

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	11.0	8.5	9.8

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	21.4	22.8	8.8	15.0	17.0	9.0	3.5	2.0	6.6

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.3	0.1	0.2
Total Del/Veh (s)	23.8	23.7	8.1	22.4	25.2	14.5	12.6	5.2	2.0	15.0	7.7	2.7

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	8.7

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.0	0.0	0.5	3.2	0.2	0.1	0.4
Total Del/Veh (s)	3.9	1.6	0.7	0.2	14.8	5.6	2.5

Total Zone Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	465.1

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	115	144	95	217	76	134	142	129	121	124
Average Queue (ft)	49	59	25	95	19	60	62	54	38	56
95th Queue (ft)	96	113	65	178	53	106	112	104	85	100
Link Distance (ft)		366		381		1880	1880		595	595
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140		120		80			90		
Storage Blk Time (%)	0	1		6	0	2		3	0	
Queuing Penalty (veh)	0	0		2	0	1		7	1	

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	41	78	63	58	70	106	128	108	203	215
Average Queue (ft)	7	31	16	19	24	44	62	23	94	101
95th Queue (ft)	26	63	43	43	56	88	106	64	173	181
Link Distance (ft)	169	169	148	148		810	810		266	266
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (ft)					95			95		
Storage Blk Time (%)					0	0		0	7	
Queuing Penalty (veh)					0	0		0	3	

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	178	208	165	161
Average Queue (ft)	80	89	77	76
95th Queue (ft)	150	164	135	138
Link Distance (ft)	266	266	251	251
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	84	17	198	206	104	87
Average Queue (ft)	32	1	90	98	39	32
95th Queue (ft)	70	7	171	173	79	72
Link Distance (ft)	145	174	260	260	441	441
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	108	149	112	118	172	113
Average Queue (ft)	45	60	55	56	84	29
95th Queue (ft)	91	121	102	103	142	78
Link Distance (ft)	253	282	111	111	583	583
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			1	1		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9001: M-83 & Weiss St

Movement	SE	NW	SW	SW
Directions Served	LT	T	L	R
Maximum Queue (ft)	65	4	104	35
Average Queue (ft)	6	0	48	10
95th Queue (ft)	31	3	84	34
Link Distance (ft)	1032	799	256	256
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 17

2045 No Build Conditions - Weekend PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	344.5	342.0	336.9	199.6	196.9	195.2	0.1	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	362.1	88.4	80.9	105.5	142.2	129.5	20.6	11.2	14.2	43.4	6.2	4.6

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	94.8
Total Del/Veh (s)	57.7

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.3	0.1	0.4	0.2	0.3	0.1	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	32.5	25.1	16.1	37.0	27.6	20.9	24.6	9.8	22.7	180.9	15.9	14.5

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	28.5

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	9.1	21.9	15.9

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.4	16.1	15.1	9.5	27.0	10.6	14.1	7.1	4.4	5.8	7.8

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.3	0.2	0.2
Total Del/Veh (s)	25.9	26.8	14.5	33.0	31.3	18.6	14.8	6.1	3.8	13.8	8.4	3.6

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	10.3

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	1.1	0.5	2.3	3.3	1316.9	1339.5	267.3
Total Del/Veh (s)	36.9	29.5	3.8	3.3	426.9	57.2	35.2

Total Zone Performance

Denied Del/Veh (s)	211.5
Total Del/Veh (s)	1214.4

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	215	381	195	396	100	133	161	163	238	224
Average Queue (ft)	185	306	170	384	37	79	97	91	64	65
95th Queue (ft)	267	485	266	459	74	123	146	155	168	139
Link Distance (ft)		366		381		1880	1880		595	595
Upstream Blk Time (%)		59		84						
Queuing Penalty (veh)		0		0						
Storage Bay Dist (ft)	140		120		80			90		
Storage Blk Time (%)	75	19	2	92	1	6		19	0	
Queuing Penalty (veh)	190	22	9	77	2	4		43	1	

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	34	94	121	133	130	165	196	170	292	257
Average Queue (ft)	7	34	43	47	52	52	103	133	169	114
95th Queue (ft)	27	76	92	106	99	119	172	204	331	238
Link Distance (ft)	172	172	148	148		810	810		264	264
Upstream Blk Time (%)			1	1					22	1
Queuing Penalty (veh)			0	0					69	3
Storage Bay Dist (ft)					95			95		
Storage Blk Time (%)					2	1		60	5	
Queuing Penalty (veh)					5	2		142	7	

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	NB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	139	144	258	226
Average Queue (ft)	65	69	131	102
95th Queue (ft)	131	126	262	215
Link Distance (ft)	264	264	284	284
Upstream Blk Time (%)			9	0
Queuing Penalty (veh)			26	1
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	81	30	162	157	128	140
Average Queue (ft)	28	4	85	87	50	54
95th Queue (ft)	64	21	143	154	100	112
Link Distance (ft)	145	175	231	231	441	441
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	114	143	107	122	193	173
Average Queue (ft)	44	65	45	51	97	48
95th Queue (ft)	91	123	82	94	164	119
Link Distance (ft)	253	282	111	111	583	583
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9001: M-83 & Weiss St

Movement	SE	B1	NW	NW	SW	SW
Directions Served	LT	T	T	R	L	R
Maximum Queue (ft)	793	33	16	64	289	288
Average Queue (ft)	254	1	1	11	265	227
95th Queue (ft)	644	23	9	40	281	368
Link Distance (ft)	1042	257	802		255	255
Upstream Blk Time (%)	1				99	61
Queuing Penalty (veh)	5				0	0
Storage Bay Dist (ft)				170		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 608

Appendix D - Three-Lane Conditions SimTraffic Results

2045 Three-Lane Conditions - Weekday PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.8	0.3	0.4	3.6	0.4	0.4	0.4	0.0	0.1	0.2	0.0	0.0
Total Del/Veh (s)	41.9	18.0	9.9	22.7	23.0	13.7	27.5	12.4	10.7	24.2	10.3	7.7

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	15.0

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	18.9	22.0	7.3	20.6	17.3	9.1	25.7	10.1	8.2	22.5	5.2	3.2

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	9.2

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	9.0	11.3	10.2

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBT	EBR	WBT	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	24.6	23.5	10.8	20.4	11.2	4.7	5.0	3.2	5.5

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.2	0.4	0.4
Total Del/Veh (s)	22.8	24.4	11.9	26.1	26.8	10.5	12.4	3.8	1.8	16.3	9.3	6.6

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	9.0

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.3	0.0	0.5	3.2	0.2	0.1	0.4
Total Del/Veh (s)	4.4	1.5	0.7	0.3	15.7	5.0	2.5

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	490.9

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	132	154	98	219	143	265	152	258
Average Queue (ft)	52	60	25	96	27	126	70	123
95th Queue (ft)	107	115	67	181	89	224	138	217
Link Distance (ft)		378		393		1883		596
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	140		120		80		90	
Storage Blk Time (%)	1	0		5	0	13	5	13
Queuing Penalty (veh)	2	0		2	1	4	35	19

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	27	78	61	61	147	260	54	114
Average Queue (ft)	5	28	16	20	38	112	19	45
95th Queue (ft)	20	58	43	46	89	203	45	90
Link Distance (ft)	180	180	160	160		813		251
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)					95		95	
Storage Blk Time (%)					0	9		1
Queuing Penalty (veh)					0	6		1

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	SB
Directions Served	T	T
Maximum Queue (ft)	207	248
Average Queue (ft)	94	134
95th Queue (ft)	174	224
Link Distance (ft)	251	274
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	TR
Maximum Queue (ft)	103	29	24	154	149
Average Queue (ft)	34	2	3	70	63
95th Queue (ft)	81	15	16	128	125
Link Distance (ft)	151	181		267	441
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)			100		
Storage Blk Time (%)				4	2
Queuing Penalty (veh)				0	0

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	99	169	43	138	48	236
Average Queue (ft)	37	61	12	56	11	109
95th Queue (ft)	77	128	35	110	32	205
Link Distance (ft)	260	276		112	582	582
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				3		
Storage Bay Dist (ft)			100			
Storage Blk Time (%)				1		
Queuing Penalty (veh)				0		

Intersection: 9001: M-83 & Weiss St

Movement	SE	SE	NW	SW	SW
Directions Served	L	T	T	L	R
Maximum Queue (ft)	30	14	6	119	30
Average Queue (ft)	4	0	0	46	10
95th Queue (ft)	19	10	0	87	33
Link Distance (ft)		1031	805	250	250
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 74

2045 Three-Lane Conditions - Weekend PM

1001: M-83 & Jefferson St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	825.3	824.0	866.9	107.0	101.8	107.3	2.3	7.6	5.5	16.0	11.4	5.5
Total Del/Veh (s)	683.1	147.8	157.4	83.7	105.9	104.0	333.6	329.6	335.8	211.2	81.6	81.6

1001: M-83 & Jefferson St Performance by movement

Movement	All
Denied Del/Veh (s)	176.5
Total Del/Veh (s)	210.9

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.2	37.0	22.9	32.9	27.6	16.5	22.6	1.2	0.8	0.6
Total Del/Veh (s)	31.3	25.1	23.5	65.0	23.2	19.0	156.7	167.3	169.0	256.8	48.6	42.2

1003: M-83 & Covered Bridge Ln Performance by movement

Movement	All
Denied Del/Veh (s)	13.5
Total Del/Veh (s)	113.5

1004: M-83 & Ped Xing (Push Button) Performance by movement

Movement	NBT	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	13.2	75.3	44.0

1005: M-83 & Cass St Performance by movement

Movement	EBL	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1	0.0		68.4	113.3	40.7
Total Del/Veh (s)	43.5	42.1	9.5	8.6	47.6	15.1	14.6		91.7	88.0	59.4

1007: M-83 & Tuscola St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	77.9	106.4	93.8	515.1	652.4	565.9	0.0	0.2	0.1	222.2	255.9	322.6
Total Del/Veh (s)	278.9	243.5	291.8	401.3	389.8	379.1	93.4	8.4	5.9	27.0	116.8	133.0

1007: M-83 & Tuscola St Performance by movement

Movement	All
Denied Del/Veh (s)	193.2
Total Del/Veh (s)	111.1

9001: M-83 & Weiss St Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Del/Veh (s)	0.2	0.1	32.6	31.7	1072.0	1039.5	242.5
Total Del/Veh (s)	29.3	3.4	28.8	17.0	251.2	125.6	42.0

Total Zone Performance

Denied Del/Veh (s)	312.2
Total Del/Veh (s)	2255.8

Intersection: 1001: M-83 & Jefferson St

Movement	EB	EB	WB	WB	NB	NB	B9005	SB	SB
Directions Served	L	TR	L	TR	L	TR	T	L	TR
Maximum Queue (ft)	215	393	195	408	154	1987	960	165	613
Average Queue (ft)	209	370	144	340	105	1710	600	150	480
95th Queue (ft)	237	482	263	520	212	2461	1309	203	795
Link Distance (ft)		378		393		1883	948		596
Upstream Blk Time (%)		86		56		70	13		24
Queuing Penalty (veh)		0		0		616	115		158
Storage Bay Dist (ft)	140		120		80			90	
Storage Blk Time (%)	98	7	2	75	4	77		82	21
Queuing Penalty (veh)	247	7	7	63	31	61		406	34

Intersection: 1003: M-83 & Covered Bridge Ln

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	30	109	119	115	170	831	170	294
Average Queue (ft)	5	43	47	45	157	814	160	284
95th Queue (ft)	21	106	113	100	225	883	204	314
Link Distance (ft)	185	185	160	160		813		273
Upstream Blk Time (%)		1	6	1		27		47
Queuing Penalty (veh)		0	0	0		235		295
Storage Bay Dist (ft)					95		95	
Storage Blk Time (%)					3	83	83	35
Queuing Penalty (veh)					18	122	423	44

Intersection: 1004: M-83 & Ped Xing (Push Button)

Movement	NB	SB
Directions Served	T	T
Maximum Queue (ft)	284	319
Average Queue (ft)	147	295
95th Queue (ft)	260	378
Link Distance (ft)	273	297
Upstream Blk Time (%)	0	46
Queuing Penalty (veh)	3	291
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 1005: M-83 & Cass St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	87	23	172	230	6	461
Average Queue (ft)	32	2	41	171	0	426
95th Queue (ft)	79	14	124	245	4	564
Link Distance (ft)	151	179		213		441
Upstream Blk Time (%)				2		46
Queuing Penalty (veh)				9		352
Storage Bay Dist (ft)			100		100	
Storage Blk Time (%)			0	16		69
Queuing Penalty (veh)			0	6		1

Intersection: 1007: M-83 & Tuscola St

Movement	EB	WB	NB	NB	B9013	SB	SB
Directions Served	LTR	LTR	L	TR	T	L	TR
Maximum Queue (ft)	275	296	72	175	156	612	615
Average Queue (ft)	181	216	21	85	8	393	483
95th Queue (ft)	347	375	60	151	95	856	807
Link Distance (ft)	260	276		112	475	582	582
Upstream Blk Time (%)	44	59	0	3	0	50	63
Queuing Penalty (veh)	0	0	0	15	0	0	0
Storage Bay Dist (ft)			100				
Storage Blk Time (%)			0	3			
Queuing Penalty (veh)			1	1			

Intersection: 9001: M-83 & Weiss St

Movement	SE	SE	NW	NW	SW	SW
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	120	211	745	206	292	285
Average Queue (ft)	50	21	227	79	264	249
95th Queue (ft)	107	171	806	253	280	336
Link Distance (ft)		1040	802		250	250
Upstream Blk Time (%)			16		98	69
Queuing Penalty (veh)			0		0	0
Storage Bay Dist (ft)	100			170		
Storage Blk Time (%)	3	0	23			
Queuing Penalty (veh)	18	0	109			

Zone Summary

Zone wide Queuing Penalty: 3688